State of California
North Coast Regional Water Quality Control Board

# 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

FINAL
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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 | North Coast Regional Water Quality Control Board |
| RWQCB | North Coast 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, makes 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 (Regional Water Board) is responsible for developing and adopting the 2008 Integrated Report for waters within the North Coast Region of California. Following adoption by the 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 Quality Control 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 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 controls[1]. 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 waterbody] 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)). The USEPA considers Category 5 waterbodies as the only category that constitutes the 303(d) List. Therefore, the USEPA will approve a 2008 statewide Category 5 list (for more information on the Integrated Report Categories, please see Table 1 of this report).

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)).

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

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.

## 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 2004a) 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, 2004b) 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 considered 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 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 in Copco I and II and Iron Gate Reservoirs located in the mainstem Klamath River reach between Copco 1 Reservoir to Iron Gate Dam.

## STATE vs. FEDERAL 303(d) LIST

The State Water Board considers waters that fall into the Integrated Report Categories 4a, 4b, and 5 as constituting the California 303(d) List (for more information on the Integrated Report Categories, please see Table 1 of this report). The USEPA considers Category 5 waterbodies as the only category that constitutes the 303(d) List. Therefore, the Regional and State Water Boards will review and approve all Category 4a, 4b, and 5 waterbodies. The USEPA will approve a 2008 statewide Category 5 list.

# 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 Regional Water Board staff and approved by the Regional Water Board, the State Water Board, and the USEPA.

Throughout the assessment process, 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 (LOE) 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 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, 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, 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 are what California considers the Section 303(d) List of Impaired Waters and this list requires public review, approval by the Regional Water Board, and approval by the State Water Board. 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

(see Table 1). A statewide Category 5 list will be submitted to the USEPA for final approval, as the USEPA only considers Category 5 waterbodies for placement on the 303(d) List.

**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, 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 |

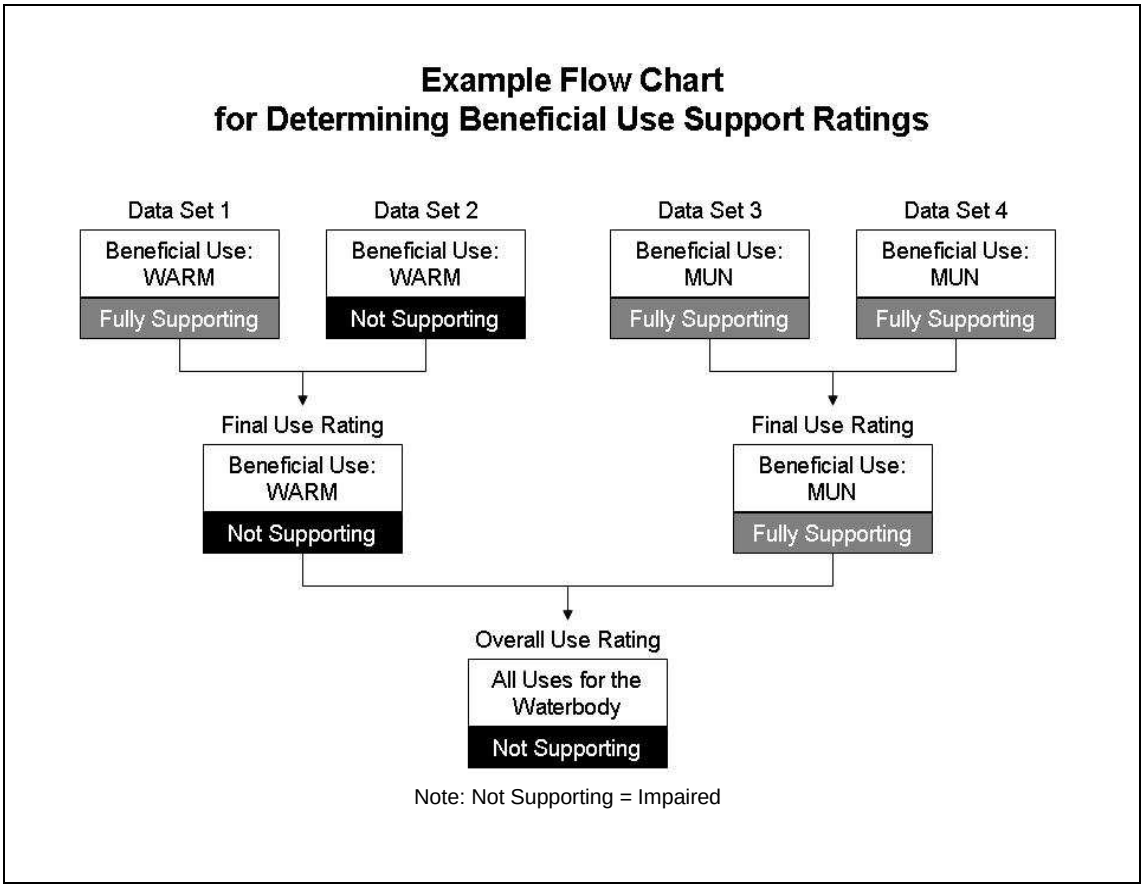


Figure 1: Example Flow Chart for Determining Beneficial Use Support Ratings

**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 10.

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 already have resources dedicated to the effort. Schedules for TMDLs with completion dates after 2012 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 2012.

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 (1997), which states that schedules should be expeditious and normally extend from eight to thirteen years in length, but could be shorter or slightly longer depending on State-specific factors. Therefore, the

timeline for completing TMDLs for waterbodies listed for the first time as part of the 2008 Integrated Report is estimated to be no longer than thirteen years, which equates to an estimated completion date of 2021.

## EXPLANATION OF SPECIFIC ANALYSES

Several of the analyses conducted by 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

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 as sediment impaired. These waterbodies are shown in Figures 2 and 3.

In the Iron Gate Dam to Scott River reach:

- Beaver Creek
- Cow Creek
- Deer Creek
- Hungry Creek
- West Fork Beaver Creek

In the Scott River to Trinity River reach:

- China Creek
- Fort Goff Creek
- Grider Creek
- Portuguese Creek
- Thompson Creek
- Walker Creek

Regional Water Board staff utilized the following approach to determine sediment impairment. This approach was utilized in making determinations about impaired waterbodies in the Middle Klamath River and Lower Klamath River hydrologic areas. This approach is supported by the Listing Policy (SWRCB 2004a) and Functionally Equivalent Document to the Listing Policy (SWRCB 2004b). Staff analyzed percent fines, embeddedness, road density, visual estimates of pool reduction, and cumulative impacts data. The majority of this data were found in environmental and ecosystem analyses developed by the Klamath National Forest. Instream sediment data (i.e. percent fines and embeddedness) were used as the primary evidence/basis for sediment impairment listings. Upslope information (i.e. road density), visual estimates of pool filling, and cumulative impacts data from USFS reports were used only as supporting evidence, not as the primary evidence for listing waterbodies. The evaluation guidelines for each of these measures are identified in the Lines of Evidence. Thus, only waterbodies where instream sediment data were available, and those data exceed the evaluation guideline, were determined to be sediment impaired.

Tables 3 and 4 present the primary and supporting evidence utilized to determine sediment impairment. If a waterbody exceeded the evaluation guideline for either fine sediment or embeddedness, staff recommended that the waterbody be listed as

sediment impaired. This was done in compliance with Section 3.11 of the Listing Policy as the weight of evidence demonstrates that instream sediment conditions in the above waterbodies do not attain sediment objectives and/or evaluation guidelines.

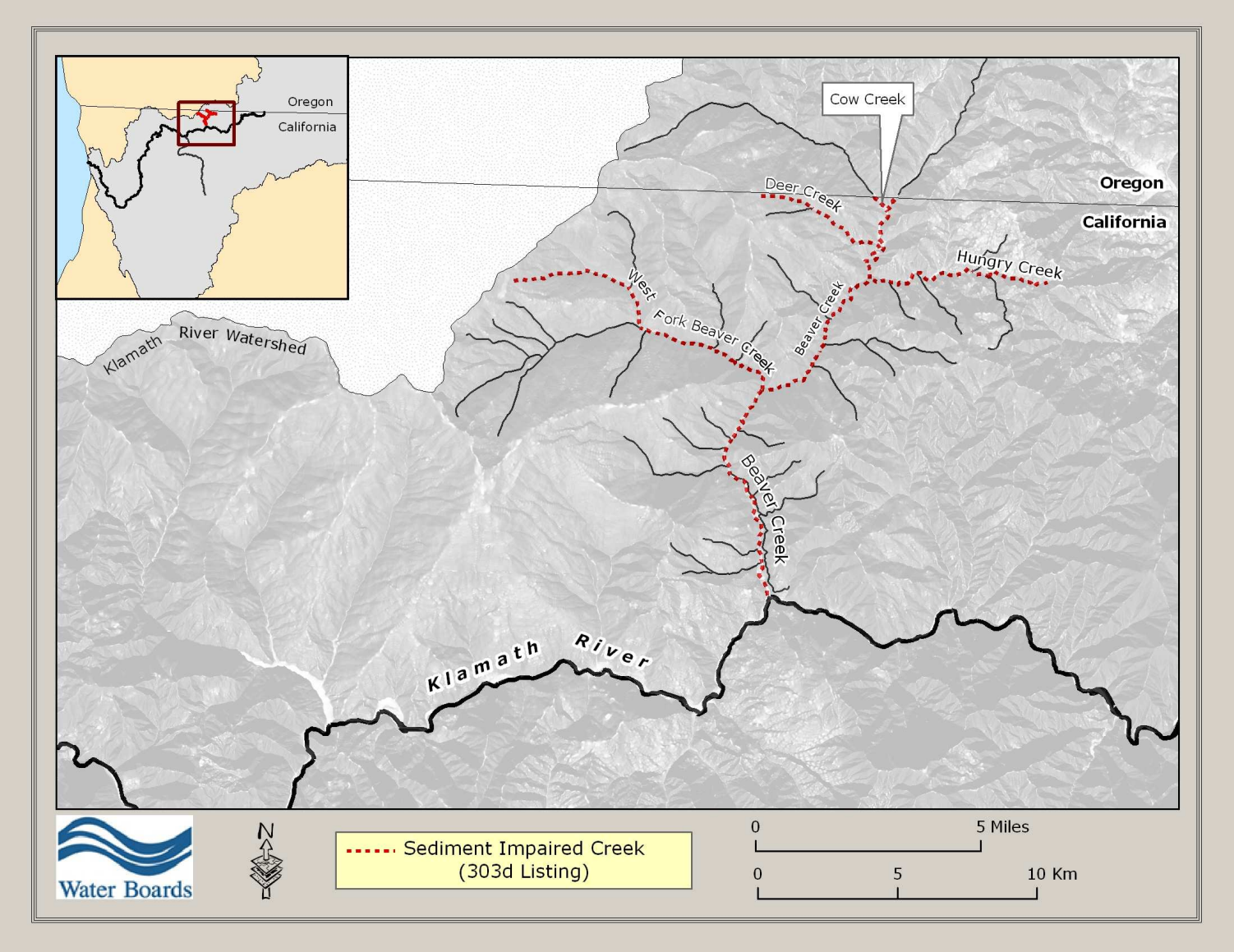


Figure 2. Sediment Impaired Waterbodies in the Iron Gate Dam to Scott River Reach of the Klamath River Watershed

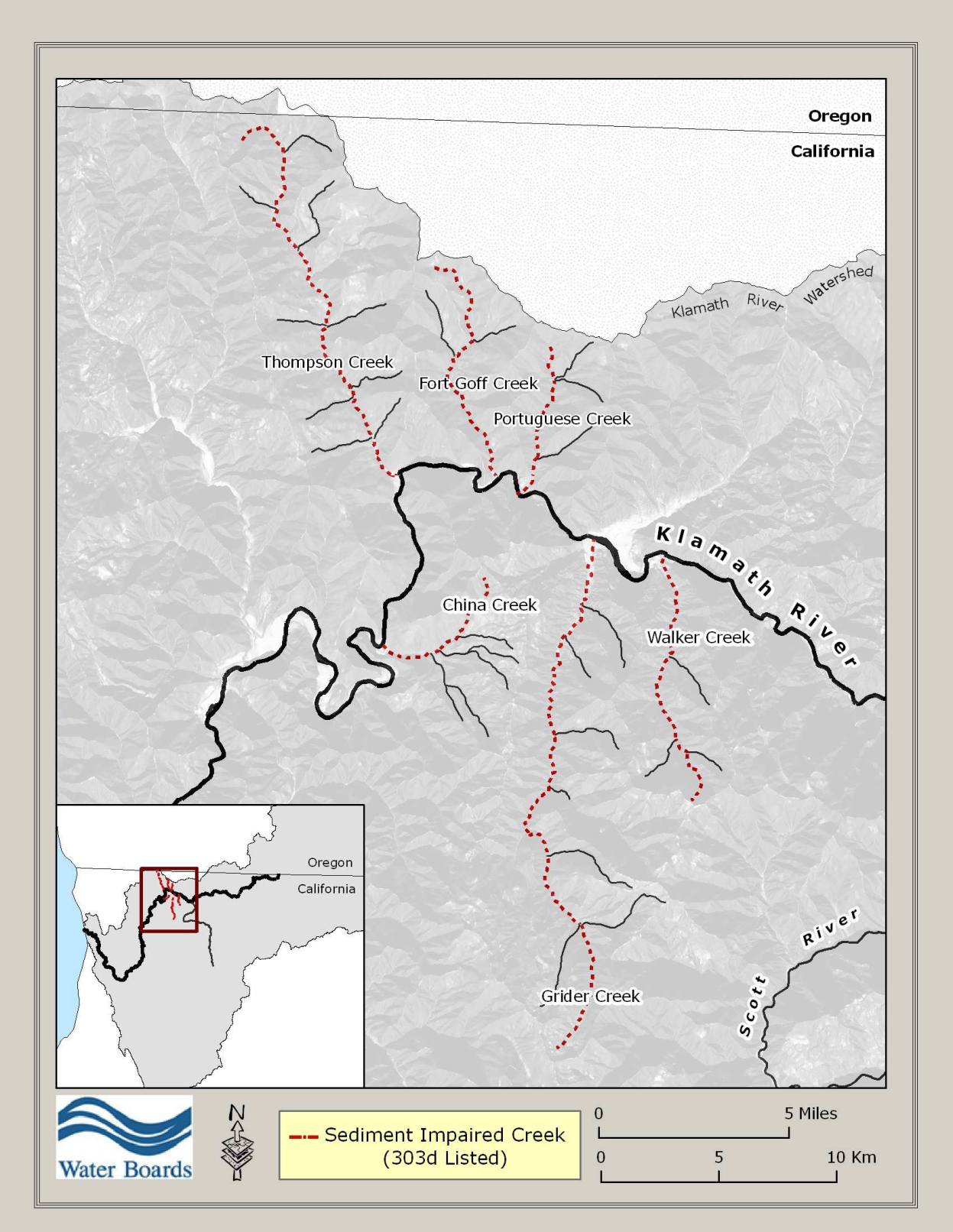


Figure 3. Sediment Impaired Waterbodies in the Scott River to Trinity River Reach of the Klamath River Watershed

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

| Waterbody | % Fines | Embeddedness | Pool Reduction | Road Density | Cumulative Impacts |
|---|---|---|---|---|---|
| **Creeks To Be Listed & Primary Evidence** | | | | | |
| Beaver Creek | Y | Y | | | |
| Cow Creek * | Y | Y | | | |
| Deer Creek | Y | Y | | | |
| Hungry Creek | Y | Y | | | |
| West Fork Beaver Creek | Y | Y | | | |
| **Supporting Evidence for Listings** | | | | | |
| Beaver Creek Watershed | | | Y | | Y |
| Beaver Creek Watershed, Buckhorn Creek subwatershed | | | | Y | |
| Beaver Creek Watershed, Bumblebee Creek subwatershed | | | | Y | |
| Beaver Creek Watershed, Cow Creek subwatershed* | | | | Y | |
| Beaver Creek Watershed, Hungry Creek subwatershed* | | | | Y | |
| Beaver Creek Watershed, Grouse Creek subwatershed | | | | Y | |
| Beaver Creek Watershed, West Fork Beaver Creek subwatershed | | | | Y | |

Y = Exceedance of Objective or Evaluation Guideline Blank Cell = No Data
*Waterbody located in both Oregon and California.

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

| Waterbody | % Fines | Embeddedness | Pool Reduction |
|---|---|---|---|
| **Creeks To Be Listed & Primary Evidence** | | | |
| China Creek | N | Y | |
| Fort Goff Creek | N | Y | |
| Grider Creek | Y | Y | |
| Portuguese Creek | N | Y | |
| Thompson Creek | Y | Y | |
| Walker Creek | Y | N | |
| **Supporting Evidence for Listings** | | | |
| Grider Creek | | | Y |
| Walker Creek | | | Y |

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 next Integrated Report.

**Comparison of E. coli Data to the Fecal Coliform Objective**

The Basin Plan has numeric water quality objectives for fecal and total Coliform. In addition, there are evaluation guidelines for E. coli and Enterococcus. 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, and 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. However, if the median E. coli concentrations for any 30-day period are less than 50 MPN / 100 ml, 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.

**E. coli and Enterococcus Evaluation Guidelines for Freshwater**

The evaluation guidelines for E. Coli and Enterococcus utilized to interpret the Basin Plan objective are cited from the "California Department of Health Services Draft Guidance for Fresh Water Beaches" (CA DHS 2006). It should be noted that these evaluation guidelines from CA DHS are the same as those recommended in the USEPA document "Ambient Water Quality Criteria for Bacteria-1986" (USEPA 1986).

**SWAMP Data Use**

The Surface Water Ambient Monitoring Program (SWAMP) has provided an extensive amount of high quality data collected from 48 rivers and streams in the North Coast Region. A summary of these data are found in the "Surface Water Ambient Monitoring Program Summary Report for the North Coast Region (RWQCB-1) for Years

2000-2006" (available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/regionalreports.shtml#rb1). SWAMP data collected since 2006 are not yet available in final form, and are therefore not considered for the 2008 Integrated Report.

Regional Water Board staff reviewed and analyzed all available SWAMP data. Most of the data was input into lines of evidence in the California Water Quality Assessment (CalWQA) database. However, several SWAMP data sets were not entered because of data limitations, including incomparability to criteria. The discussion below describes which data were and were not entered into the CalWQA database and justifies the exclusions.

SWAMP Parameters Included in CalWQA:

- Ammonia as Nitrogen
- Aluminum
- Chloride
- Metals (includes arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc)
- PCBs
- Pesticides
- Pentachlorophenol
- Specific Conductivity
- Sulfates
- 2,3,4,6-Tetrachlorophenol

SWAMP Parameters Not Included in CalWQA:

- Chlorophyll-a
- Phosphorus
- Total Nitrogen
- Dissolved Oxygen
- pH
- Water Temperature
- Hardness
- Total Dissolved Solids
- Nonylphenol
- Nonylphenoethoxylate
- 2,3,4,5-Tetrachlorophenol
- 2,3,5,6-Tetrachlorophenol

Regional Water Board staffs' approach to assessing nutrient data is consistent with the State Water Board's Staff Report on "Nutrient Screening Tools for use in the 303(d) Process" (SWRCB 2007) and is based on the "Technical Approach to Develop Nutrient Numeric Endpoints for California" (TetraTech 2006). Chlorophyll-a, phosphorus, and total nitrogen data were not included in CalWQA because the data are from grab samples and are not directly comparable to the Basin Plan's narrative biostimulatory substances water quality objective. Nutrients alone do not impair beneficial uses or cause non-attainment of objectives (with the exception of ammonia and nitrate).

Rather, nutrients cause indirect impacts through aquatic plant growth (photosynthesis and respiration), which can result in extreme diel patterns for dissolved oxygen and pH, which can impair uses. Waterbody-specific factors such as riparian cover, flow conditions, and stream channel configuration also affect how nutrients are processed within the stream, and play a large role in determining whether or not nuisance aquatic plant conditions will prevail. For these reasons, assessment of a single nutrient concentration is not sufficient to determine compliance with the existing biostimulatory substances narrative water quality objective. Instead, nutrient-related indicator parameters (such as diel measurements of dissolved oxygen, pH, chlorophyll-a, and aquatic plant biomass) are needed in order to determine attainment of objectives and protection of beneficial uses. To this end, Regional Water Board staff are refocusing future SWAMP sampling efforts to assess nutrient-related impairment of North Coast streams, especially in the Russian River and Eel River watersheds.

The dissolved oxygen and pH data collected by SWAMP are instantaneous grab samples and are comparable to the existing water quality objectives found in the Basin Plan. However, since the grab samples were collected once a month, once a quarter, or even once a year or longer, it is impossible to determine the impacts of dissolved oxygen and pH concentrations on beneficial uses since concentrations rise and fall throughout the diel cycle. Regional Water Board staff are currently developing new dissolved oxygen objectives for the North Coast Region, which will propose new daily minimum concentrations as well as moving 7-day averages of the daily average concentrations. For these reasons, staff did not input instantaneous grab sample dissolved oxygen and pH data from SWAMP into the CalWQA database.

The water temperature data were not included in CalWQA because the data were collected as grab samples and not collected at sub-daily time steps over 7 consecutive days, which is necessary in order to compare data to the evaluation guideline. The evaluation guideline is detailed in the report: "Effects of Temperature, Dissolved Oxygen/Total Dissolved Gas, Ammonia, and pH on Salmonids" (Carter 2008). This temperature evaluation guideline is for chronic exposure by salmonids and requires data that is measured for at least 7 consecutive days, as salmonids may survive brief periods at the temperatures listed as the evaluation guideline level.

The hardness and total dissolved solids data were not included in CalWQA because the information that could be gained by inputting these data is inconsequential. Specific conductivity data has been thoroughly analyzed by staff and input into CalWQA. Since specific conductivity, hardness, and total dissolved solids are interrelated, and since there were no specific conductivity exceedances of objectives, staff conclude that there are no exceedances of hardness and total dissolved solids objectives from SWAMP data.

Nonylphenol, nonylphenoethoxylate, 2,3,4,5-Tetrachlorophenol, and 2,3,5,6-Tetrachlorophenol data were not included in CalWQA because there are no numeric criteria available that can be used as evaluation guidelines to interpret the narrative toxicity water quality objective.

**Proposed Onsite Wastewater Treatment System Regulations (AB885) Impacts**

Legislation (AB 885, 2000 Jackson) has directed the State Water Board to adopt regulations for onsite wastewater treatment systems (septic systems). At the present time, the State Water Board has drafted regulations for septic systems and is in the process of reviewing public comments on the proposed regulations.

As currently written, the proposed AB 885 regulations state the following:

- Where existing septic systems have been identified by a Regional Water Board to be contributing to impairment of a waterbody, owners of septic systems within 600 feet of the waterbody will be required to:
    - Have a qualified professional determine whether the septic system is contributing to the impairment.
    - If so, retrofit the septic system with supplemental treatment
- New septic systems located along a waterbody where the Regional Water Board has determined that septic systems are contributing to impairment will be required to comply with the requirements for existing septic systems, as well as additional requirements.

Thus, under the current proposed regulations, the following must be in place before any inspection requirements take effect. First, the waterbody must be listed as impaired for indicator bacteria or pathogens. Second, the TMDL must be finished. Third, the TMDL must show that septic systems are contributing to the impairment of the waterbody. If all of these are the case, then there are requirements for inspection to those systems within 600' of a waterbody that might lead to repair or upgrade requirements or connection to sewer system.

At the time that this report is being written, the Regional Water Board is unsure what, if any, impacts will result from the indicator bacteria listings in the Russian River. The proposed regulations as they currently stand are to be re-written by the State Water Board in Sacramento. Additionally, the Russian River Indicator Bacteria TMDL is still in the early stages of development and it is unknown what the outcome and findings will be.

If you interested in hearing AB885 in the future, you can join an e-mail notification list at: http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml. For additional detail on the proposed AB885 regulations please visit the State Water Board website at: http://www.waterboards.ca.gov/water_issues/programs/septic_tanks/.

# Chapter 4: Staff Recommendations

The 2008 Integrated Report, as recommended by 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 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 changes to the 303(d) List, summarize the waters in each 305(b) category, and present the new 2008 303(d) List.

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

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

Note: Following approval by the Regional and State Water Boards, the 2008 303(d) List will be tabulated by State Water Board staff in the same format as the current 2006 303(d) List.

Table 10: Presents a comprehensive summary of all of the results of staff's analyses for all waterbody/pollutant pairs and identifies the existing or proposed TMDL completion date (i.e. priority ranking) for Category 4a and 5 waterbodies, as recommended by Regional Water Board staff.

| Table 5.<br>New Delistings for the 2008 303(d) List | | |
|---|---|---|
| **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,<br>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 |
| Russian River HU | Guerneville HSA, Pocket Canyon Creek | pH |

| Table 6.<br>New Listings for the 2008 303(d) List | | |
|---|---|---|
| **Waterbody Hydrologic Unit** | **Waterbody Name** | **Pollutant(s)** |
| Eel River HU | Lower Eel River HA,<br>mainstem Eel River | Aluminum |
| | Lower Eel River HA | Dissolved Oxygen |
| | Middle Fork Eel River HA,<br>Eden Valley HSA & Round Valley HSA,<br>mainstem Middle Fork Eel River | Aluminum |
| | Middle Main Eel River HA,<br>mainstem Eel River | Aluminum |
| | South Fork Eel River HA,<br>mainstem South Fork Eel River | Aluminum |
| Klamath River HU | Middle & Lower Klamath River HAs,<br>Scott River to Trinity River Reach, mainstem Klamath River | Microcystin |
| Klamath River HU | Middle Klamath River HA,<br>Iron Gate Dam to Scott River Reach, mainstem Klamath River | Microcystin |
| Klamath River HU | Middle & Lower Klamath River HAs,<br>China Creek, Fort Goff Creek, Grider Creek,<br>Portuguese Creek, Thompson Creek, Walker Creek | Sediment |
| Klamath River HU | Middle Klamath River HA,<br>Beaver Creek, Cow Creek, Deer Creek, Hungry Creek,<br>West Fork Beaver Creek | Sediment |
| Klamath River HU | Shasta River HA, Lake Shastina | Mercury |
| Mendocino Coast HU | Gualala River | Aluminum |
| 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 | Laguna de Santa Rosa | Indicator Bacteria |

| Table 7.<br>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 |
| 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.<br>Waters with Insufficient Information to Determine Use Rating (Category 3) | |
|---|---|
| **Waterbody Hydrologic Unit** | **Waterbody Name** |
| All waterbodies in the North Coast Region not listed in Categories 2, 4a, 4b, or 5 (Tables 7, and 9), including those listed below. | |
| Mendocino Coast HU | Chadbourne Gulch Beach |
| Mendocino Coast HU | Wages Creek Beach |
| Winchuck River HU | Winchuck River |

**Table 9.**
**Impaired Waterbodies (Categories 4a[1], 4b, and 5) – The 2008 303(d) List**

| Waterbody HU | Waterbody Name | Pollutant | Category |
|---|---|---|---|
| Bodega HU | Bodega Harbor HA | Exotic Species | 5 |
| | Campbell Cove | Indicator Bacteria | 5 |
| | Estero Americano HA, Estuary | Nutrients | 5 |
| | | 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, mainstem Eel River | Aluminum | 5 |
| | Lower Eel River HA | Dissolved Oxygen | 5 |
| | | Sedimentation/Siltation | 4a |
| | | Temperature | 4a |
| | Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA, mainstem Middle Fork Eel River | Aluminum | 5 |
| | Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA | Sedimentation/Siltation | 4a |
| | | Temperature | 4a |
| | Middle Fork Eel River HA, Wilderness HSA & Black Butte River HSA | Temperature | 4a |
| | Middle Main Eel River HA, mainstem Eel River | Aluminum | 5 |
| | Middle Main Eel River HA | Sedimentation/Siltation | 4a |
| | | Temperature | 4a |
| | North Fork Eel River HA, Lower North Fork Eel River Watershed | Sedimentation/Siltation | 4a |
| | | Temperature | 4a |
| | North Fork Eel River HA, Upper North Fork Eel River Watershed | Temperature | 4a |
| | South Fork Eel River HA, mainstem South Fork Eel River | Aluminum | 5 |
| | 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 |

**Table 9. (cont.)**
**Impaired Waterbodies (Categories 4a, 4b, and 5) – The 2008 303(d) List**

| Waterbody HU | Waterbody Name | Pollutant | Category |
|---|---|---|---|
| Klamath River HU | 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 |
| | 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, Beaver Creek, Cow Creek, Deer Creek, Hungry Creek, West Fork Beaver Creek | 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, China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, Walker Creek | 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 |
| | Tule Lake HSA and Mt Dome HSA | Nutrients | 4a |

**Table 9. (cont.)**
**Impaired Waterbodies (Categories 4a, 4b, and 5) – The 2008 303(d) List**

| Waterbody HU | Waterbody Name | Pollutant | Category |
|---|---|---|---|
| Mad River HU | Mad River | Sedimentation/Siltation | 4a |
| | | Temperature | 4a |
| | | Turbidity | 4a |
| Mendocino Coast HU | Albion River | Sedimentation/Siltation | 4a |
| | | Temperature | 5 |
| | Big River | Sedimentation/Siltation | 4a |
| | | Temperature | 5 |
| | Garcia River | Sediment | 4a |
| | | Temperature | 5 |
| | Gualala River | Aluminum | 5 |
| | | 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 | 5 |
| | 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 |
| | Geyserville 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, 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 | 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 | 5 |
| | | Phosphorus | 5 |
| | | Sedimentation/Siltation | 5 |
| | | 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 |
| | Warms 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 |

[1] Category 4a waterbodies are those for which 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 amount of time. For the North Coast Region, all Category 4a waterbodies have a TMDL that has been approved by the USEPA, but not all of these TMDLs have a TMDL Action Plan approved by the Regional Water Board. Table 10 identifies those TMDLs with an approved Action Plan.

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Bodega HU | Bodega Harbor HA | Exotic Species | No Change - List | Y | N | 2006 | 2019 |
| Bodega HU | Campbell Cove | Indicator Bacteria | No Change – List | Y | Y | 2006 | 2019 |
| Bodega HU | Doran Regional Park | Indicator Bacteria | Delist | N | Y | 2006 | - |
| Bodega HU | Estero Americano | Nutrients | No Change - List | Y | N | 1996 | 2019 |
| Bodega HU | Estero Americano | Sedimentation/Siltation | No Change - List | Y | N | 1992 | 2019 |
| Bodega HU | Estero Americano & Americano Creek | Nutrients | No Change - List | Y | N | 1996 | 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 | 2006 | - |
| 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 | 1994 | 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 | 1996 | 2003** |
| Eel River HU | Lower Eel River HA, mainstem Eel River | Aluminum | List | Y | Y | 2008 | 2021 |
| Eel River HU | Lower Eel River HA | Ammonia as Nitrogen | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Chloride | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Diesel Fuel | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Dissolved Oxygen | List | Y | Y | 2008 | 2021 |
| Eel River HU | Lower Eel River HA | Fecal Coliform | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Gasoline | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Metals | Do Not List | N | Y | - | - |

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|---|---|---|---|---|---|---|---|
| Eel River HU | Lower Eel River HA | Oil | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | PCBs | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Pentachlorophenol | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Eel River HU | Lower Eel River HA | pH | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Sedimentation/Siltation | No Change - List | Y | N | 1994 | 2007* |
| Eel River HU | Lower Eel River HA | Specific Conductivity | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Sulfates | Do Not List | N | Y | - | - |
| Eel River HU | Lower Eel River HA | Temperature, water | Do Not Delist | Y | Y | 1996 | 2007** |
| Eel River HU | Lower Eel River HA | Total Coliform | Do Not List | N | Y | - | - |
| Eel River HU | Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA, mainstem Middle Fork Eel River | Aluminum | List | Y | Y | 2008 | 2021 |
| 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 | 1994 | 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 | Temperature, water | No Change - List | Y | N | 1996 | 2003** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | HSA | | | | | | |
| Eel River HU | Middle Fork Eel River HA, Wilderness & Black Butte River HSAs | Sediment | Delist | N | Y | 2008 | 2003* |
| Eel River HU | Middle Fork Eel River HA, Wilderness & Black Butte River HSAs | Temperature, water | No Change - List | Y | N | 2008 | 2003** |
| Eel River HU | Middle Main Eel River HA, mainstem Eel River | Aluminum | List | Y | Y | 2008 | 2021 |
| 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1994 | 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 | - | - |
| Eel River HU | Middle Main Eel River HA | Temperature, water | No Change - List | Y | N | 1996 | 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 | 1994 | 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 | 1996 | 2002** |
| Eel River HU | North Fork Eel River HA, Upper | Sediment | Delist | N | Y | 2008 | 2002* |
| Eel River HU | North Fork Eel River HA, Upper | Temperature, water | No Change – List | Y | N | 2008 | 2002** |
| Eel River HU | South Fork Eel River HA, mainstem South Fork Eel River | Aluminum | List | Y | Y | 2008 | 2021 |
| 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 | 1994 | 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 | 1996 | 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1994 | 2004* |
| Eel River HU | Upper Main Eel River HA | Specific Conductivity | Do Not List | N | Y | - | - |
| 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 | 1996 | 2004** |
| Eel River HU | Upper Main Eel River HA, Lake Pillsbury | Mercury | No Change - Do Not Delist | Y | N | 1998 | 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 | 1994 | 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 | 1998 | 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 | 1998 | 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Eureka Plain HU | Humboldt Bay | Chromium | Do Not List | N | Y | - | - |
| Eureka Plain HU | Humboldt Bay | Dioxin Toxic Equivalents | Do Not Delist | Y | Y | 2006 | 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 | 2002 | 2019 |
| Eureka Plain HU | Humboldt Bay | Pentachlorophenol | Do Not List | N | Y | - | - |
| 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 | 2002 | 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 | - | - |

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|---|---|---|---|---|---|---|---|
| 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 | 1996 | 2019 |
| Klamath River HU | Butte Valley HA | Temperature, water | No Change - List | Y | N | 1996 | 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 | 2008 | 2019 |
| Klamath River HU | Iron Gate Reservoir | Microcystin | Do Not Delist | Y | Y | 2008 | 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1996 | 2010 |
| Klamath River HU | Klamath Glen HSA | Organic Enrichment / Low Dissolved Oxygen | No Change - List | Y | N | 1998 | 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 | - | - |
| Klamath River HU | Klamath Glen HSA | Sedimentation/Siltation | No Change - List | Y | N | 1996 | 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 | 1996 | 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, | Microcystin | List | Y | Y | 2008 | 2010 |

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|---|---|---|---|---|---|---|---|
| | mainstem Klamath River | | | | | | |
| Klamath River HU | Middle & Lower Klamath River HAs, Scott River to Trinity River Reach | Nutrients | Do Not Delist | Y | Y | 1996 | 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 | 1998 | 2010 |
| Klamath River HU | Middle & Lower Klamath River HAs, China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, Walker Creek | Sediment | List | Y | Y | 2008 | 2021 |
| Klamath River HU | Middle & Lower Klamath River HAs, Scott River to Trinity River Reach | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Klamath River HU | Middle & Lower Klamath River HAs, Scott River to Trinity River Reach | Temperature, water | Do Not Delist | Y | Y | 1996 | 2010 |
| 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 | 2008 | 2010 |
| Klamath River HU | Middle Klamath River HA, Iron Gate Dam to Scott River Reach | Nutrients | No Change - List | Y | N | 1998 | 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 | 1996 | 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, Beaver Creek, Cow Creek, Deer | Sediment | List | Y | Y | 2008 | 2021 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Creek, Hungry Creek, West Fork Beaver Creek | | | | | | |
| 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 | 1998 | 2010 |
| 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 2006 | 2019 |
| Klamath River HU | Middle Klamath River HA, Oregon to Iron Gate Reach | Nutrients | No Change - List | Y | N | 1996 | 2010 |
| Klamath River HU | Middle Klamath River HA, Oregon to Iron Gate Reach | Organic Enrichment / Low Dissolved Oxygen | No Change - List | Y | N | 1998 | 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 | 1996 | 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 | 1996 | 2006** |
| 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 | Do Not Delist | Y | Y | 1996 | 2006** |
| Klamath River HU | Scott River HA | Aluminum | Do Not List | N | Y | - | - |
| 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 | DDT | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1996 | 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 | 1996 | 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 | 1998 | 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 | 1998 | 2007 |
| Klamath River HU | Shasta River HA, Lake Shastina | Mercury | List | Y | Y | 2008 | 2021 |

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|---|---|---|---|---|---|---|---|
| Klamath River HU | Tule Lake and Lower Klamath Lake National Wildlife Refuge | pH (high) | No Change - List | Y | N | 2006 | 2008 |
| Klamath River HU | Tule Lake HSA and Mt Dome HSA | Nutrients | No Change - List | Y | N | 1996 | 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 | Do Not List | N | Y | - | - |
| 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 | 1994 | 2007* |
| Mad River HU | Mad River | Specific Conductivity | Do Not List | N | Y | - | - |
| Mad River HU | Mad River | Sulfates | Do Not List | N | Y | - | - |
| Mad River HU | Mad River | Temperature, water | No Change - List | Y | N | 2002 | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Mad River HU | Mad River | Turbidity | No Change - List | Y | N | 1994 | 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 | 1994 | 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 | 2006 | 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 | 1994 | 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 | 1996 | 2019 |
| Mendocino Coast HU | Big River Beach | Indicator Bacteria | Do Not List | N | Y | - | - |

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|---|---|---|---|---|---|---|---|
| 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 | 2006 | 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 | 1994 | 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 | 2002 | 2019 |
| 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 | - | - |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | List | Y | Y | 2008 | 2021 |
| 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 | 1994 | 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 | 2002 | 2019 |
| Mendocino Coast HU | Hare Creek Beach | Indicator Bacteria | List | Y | Y | 2008 | 2021 |
| Mendocino Coast HU | Little River | Ammonia as Nitrogen | Do Not List | N | Y | - | - |

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|---|---|---|---|---|---|---|---|
| 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 | 1994 | 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 | 1996 | 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 | - | - |
| Mendocino Coast HU | Noyo River | Lead | Do Not List | N | Y | - | - |
| Mendocino Coast HU | Noyo River | Sedimentation/Siltation | No Change - List | Y | N | 1994 | 1999* |

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

| Waterbody Hydrologic Unit | Waterbody Name | Pollutant(s) | Staff Recommendation | Impaired | Based on New Data | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 2006 | 2019 |
| Mendocino Coast HU | Pudding Creek | Temperature, water | Do Not Delist | Y | Y | 2006 | 2019 |
| Mendocino Coast HU | Pudding Creek Beach | Indicator Bacteria | List | Y | Y | 2008 | 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 | - | - |

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|---|---|---|---|---|---|---|---|
| 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 | 1996 | 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 | 2002 | 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 | - | - |
| Redwood Creek HU | Redwood Creek | Metals | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1994 | 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 | 2002 | 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 | - | - |

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|---|---|---|---|---|---|---|---|
| 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 | 1998 | 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 | 2002 | 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 | 1998 | 2019 |
| Russian River HU | Big Sulphur Creek HSA | Specific Conductivity | Do Not Delist | Y | Y | 2006 | 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 |
| Russian River HU | Coyote Valley HSA | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1998 | 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 | 2002 | 2019 |
| Russian River HU | Coyote Valley HSA, | Mercury | No Change - Do Not | Y | N | 2006 | 2012 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Lake Mendocino (Reservoir) | | Delist | | | | |
| Russian River HU | Forsythe Creek HSA | Sedimentation/Siltation | No Change - List | Y | N | 1998 | 2019 |
| Russian River HU | Forsythe Creek HSA | Temperature, water | No Change - List | Y | N | 2002 | 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 | 1998 | 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 | 2002 | 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 | 2008 | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Russian River HU | Geyserville HSA, Unnamed Tributary (Stream 1) at Fitch Mountain | Indicator Bacteria | List | Y | Y | 2008 | 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 | 2008 | 2021 |
| Russian River HU | Green Valley Creek Watershed | Indicator Bacteria | List | Y | Y | 2008 | 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 | Do Not List | N | Y | - | - |
| 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 | 1998 | 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 | 2002 | 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 | 2002 | 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 | 2006 | - |
| 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 2008 | 2012 |
| Russian River HU | Laguna de Santa Rosa | Dissolved Oxygen | Do Not Delist | Y | Y | 1990 | 2012 |
| Russian River HU | Laguna de Santa Rosa | Mercury | Do Not Delist | Y | Y | 2008 | 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 | 2006 | 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 | 2006 | 2012 |
| Russian River HU | Laguna de Santa Rosa | Sedimentation/Siltation | No Change - Do Not Delist | Y | N | 1998 | 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 | 2002 | 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 | 1998 | 2012 |
| Russian River HU | Mark West Creek HSA | Temperature, water | No Change - List | Y | N | 2002 | 2012 |
| 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 | 2006 | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| Russian River HU | Santa Rosa Creek | Sedimentation/Siltation | No Change - List | Y | N | 1998 | 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 | 2002 | 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 | 1998 | 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 | 2002 | 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 | 1998 | 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 | 2002 | 2019 |
| Russian River HU | Warms Springs HSA, Lake Sonoma (Reservoir) | Mercury | No Change - Do Not Delist | Y | N | 2002 | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 2006 | 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 | 2006 | 2019 |
| Trinidad HU | Moonstone County Park | Indicator Bacteria | Do Not Delist | Y | Y | 2006 | 2019 |
| Trinidad HU | Trinidad State Beach | Indicator Bacteria | Do Not Delist | Y | Y | 2006 | 2019 |
| Trinity River HU | East Fork Trinity River | Mercury | No Change - List | Y | N | 2006 | 2019 |
| Trinity River HU | East Fork Trinity River | Sedimentation/Siltation | No Change - List | Y | N | 1994 | 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 | 1994 | 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 | 1994 | 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 | Original Listing Date | TMDL Completion Date[1] |
|---|---|---|---|---|---|---|---|
| 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 | 1994 | 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 | 2002 | 2019 |
| Trinity River HU | Trinity Lake (was Claire Engle Lake) | Mercury | Do Not Delist | Y | Y | 2006 | 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 | 1994 | 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.

* On November 29, 2004, the Regional Water Board adopted via Resolution R1-2004-0087 the Total Maximum Daily Load Implementation Policy Statement for Sediment Impaired Receiving Waters in the North Coast Region, also known as the Sediment TMDL Implementation Policy. The Sediment TMDL Implementation Policy is the TMDL implementation plan for the North Coast Region's sediment impaired Waterbodies that do not have a Board-approved implementation Plan (Action Plan). The Resolution also directs staff to develop a Work Plan, that sets priorities for addressing excess sediment at a watershed-specific scale and describes how and when available authorities and permitting and enforcement tools will be used. The Regional Water Board Staff Work Plan to Control Excess Sediment in Sediment-Impaired Watersheds was completed in June 2008 via Resolution R1-2008-0057.

** Temperature TMDLs have been completed and approved by the USEPA in the year shown; however, these TMDLs do not yet have Action Plans approved by the Regional Water Board, and staff do not currently have a schedule for completing these temperature TMDL Action Plans.

# 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 Water 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 Board, as a statewide Integrated Report to the USEPA. A statewide Category 5 List will require final approval by the USEPA.

The North Coast Regional Water Board released the 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 (Integrated Report) on February 2, 2009. Regional Water Board staff have solicited written comments on the Integrated Report. The written public comment period ended March 20, 2009.

All written comments received by March 20, 2009, are summarized in this appendix. Comments are summarized and not duplicated verbatim. Regional Water Board staff have provided written responses to all public comments received in writing by the end of the March 20th comment period.

Regional Water Board staff held public workshops to receive comments on the Public Review Draft 2008 Integrated Report on February 17, 18, and 19, 2009 (in Santa Rosa, Eureka, and Yreka respectively). An additional workshop was held on March 19, 2009 (Santa Rosa, CA). Staff have responded in writing to all written comments received by March 20, 2009. The staff responses are included in this final Staff Report as Appendix C.

# References

California Department of Health Services. 2006. Draft Guidance for Freshwater Beaches. Last Updated May 8, 2006.

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. 2004a. 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. 2004b. 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. 2006a. 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. 2006b. 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.

Tetra Tech. 2006. Technical approach to Develop Nutrient Numeric Endpoints for California. Prepared for U.S. Environmental Protection Agency (Contract No. 68-C-02-108-TO-111), and CA State Water Resources Control Board – Planning and Standards Implementation Unit. Lafayette, CA. 120 pp.

United States Environmental Protection Agency. 1986. Ambient Water Quality for Bacteria-1986. Office of Water Regulations and Standards, Criteria and Standards Division. Washington, DC. EPA 440/5-84-002.

United States Environmental Protection Agency. 1997. Memorandum from Robert Perciasepe, Assistant Administrator, to Regional Administrators and Regional Water Division Directors Regarding New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs).

# 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:

**Table A-1.**
**Fact Sheets Included in Appendix A**

| 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, mainstem Eel River | Aluminum | List |
| Eel River HU | Lower Eel River HA | Dissolved Oxygen | List |
| Eel River HU | Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA, mainstem Middle Fork Eel River | Aluminum | List |
| Eel River HU | Middle Fork Eel River, Wilderness HSA & Black Butte River HSA | Sediment/Siltation | Delist |
| Eel River HU | Middle Main Eel River HA, mainstem Eel River | Aluminum | List |
| Eel River HU | North Fork Eel River, Upper North Fork Eel River Watershed | Sediment/Siltation | Delist |
| Eel River HU | South Fork Eel River HA, mainstem South Fork Eel River | Aluminum | List |
| 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, Beaver Creek, Cow Creek, Deer Creek, Hungry Creek, West Fork Beaver Creek | Sediment | List |
| Klamath River HU | Middle & Lower Klamath River HAs, China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, Walker Creek | Sediment | List |
| Klamath River HU | Salmon River HA | Sediment | Do Not List |
| Klamath River HU | Salmon River HA, Wooley Creek | Temperature, water | Do Not Delist |
| Klamath River HU | Scott River HA | DDT | Do Not List |

**Table A-1 (cont.)**
**Fact Sheets Included in Appendix A**

| Waterbody HU | Waterbody Name | Pollutant | Staff Recommendation |
|---|---|---|---|
| Klamath River HU | Shasta River HA, Lake Shastina | Mercury | List |
| Mad River HU | Mad River | DDE | Do Not List |
| Mendocino Coast HU | Gualala River | Aluminum | 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, various waterbodies | 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, various waterbodies | Indicator Bacteria | Do Not Delist and Do Not List |
| Russian River HU | Guerneville HSA | DDT | Do Not 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 6 exceedance for each of the enterococcus, fecal coliform, and total coliform single sample parameters. Two of the 66 enterococcus values, 0 of the 66 fecal coliform values, and 0 of the 66 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 delist). 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: | 66 |
| Number of Exceedances: | 0 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | None of the 66 single samples of fecal coliform collected during the months of April – October at Doran Regional Park Beach exceed the objective. Additionally, none of the 14 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: | 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 |
| 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: | 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 Doran Regional Park Beach. |
| Temporal Representation: | Samples were collected weekly from April through October 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

| | |
|---|---|
| **LOE ID:** | **8885** |
| **Pollutant:** | **Enterococcus** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 66 |
| Number of Exceedances: | 2 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | Two of the 66 single samples of enterococcus collected during the months of April – October at Doran Regional Park Beach exceed the objective. Additionally, none of the 14 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: | 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 |
| 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: | 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 Doran Regional Park Beach. |
| Temporal Representation: | Samples were collected weekly from April through October 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

| | |
|---|---|
| **LOE ID:** | **8879** |
| **Pollutant:** | **Total Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 66 |
| Number of Exceedances: | 0 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | None of the 66 single samples of total coliform collected during the months of April – October at Doran Regional Park Beach exceed the objective. Additionally, none of the 14 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: | 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 |
| 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: | 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 Doran Regional Park Beach. |
| Temporal Representation: | Samples were collected weekly from April through October 2005 and from April through October 2006. |

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| 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

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| **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:<br>(A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or<br>(B) 10,000 total coliform bacteria per 100 milliliters; or<br>(C) 400 fecal coliform bacteria per 100 milliliters; or<br>(D) 104 enterococcus bacteria per 100 milliliters.<br><br>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:<br>(A) 1,000 total coliform bacteria per 100 milliliters; or<br>(B) 200 fecal coliform bacteria per 100 milliliters; or<br>(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 | |

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| Conditions: | |
| QAPP Information: | Data record: summers 2001-2005, Sonoma County Health Dept. |
| QAPP Information Reference(s): | |

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| **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 6 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 66 enterococcus, 2 of 66 fecal coliform, and 2 of 66 total coliform single samples exceed the objective. One of 14 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 delist). 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**

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|---|---|
| **LOE ID:** | **25303** |
| **Pollutant:** | **Enterococcus** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 66 |
| Number of Exceedances: | 3 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | Three of the 66 single samples of enterococcus collected during the months of April – October at Salmon Creek State Park Beach exceed the objective. Additionally, one of the 14 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: | 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 |
| 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 Salmon Creek State Park Beach. |
| Temporal Representation: | Samples were collected weekly from April to October 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

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| **LOE ID:** | **25300** |
| **Pollutant:** | **Fecal Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 66 |
| Number of Exceedances: | 2 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | Two of the 66 single samples of fecal coliform collected during the months of April – October at Salmon Creek State Park Beach exceed the objective. Additionally, none of the 14 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: | 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 |
| 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: | 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 Salmon Creek State Park Beach. |
| Temporal Representation: | Samples were collected weekly from April to October 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

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| **LOE ID:** | **25304** |
| **Pollutant:** | **Total Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 66 |
| Number of Exceedances: | 2 |
| Data and Information Type: | Pathogen Monitoring |
| Data Used to Assess Water Quality: | Two of the 66 single samples of total coliform collected during the months of April – October at Salmon Creek State Park Beach exceed the objective. Additionally, none of the 14 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: | 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 |
| 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: | 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 Salmon Creek State Park Beach. |
| Temporal Representation: | Samples were collected weekly from April to October 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): | Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services |

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| **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 |
| Data Used to Assess Water Quality: | Available data indicate sufficient exceedances of bacterial indicator objectives. There were 10 out of 123 exceedances of 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:<br>(A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or<br>(B) 10,000 total coliform bacteria per 100 milliliters; or<br>(C) 400 fecal coliform bacteria per 100 milliliters; or<br>(D) 104 enterococcus bacteria per 100 milliliters.<br><br>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:<br>(A) 1,000 total coliform bacteria per 100 milliliters; or<br>(B) 200 fecal coliform bacteria per 100 milliliters; or<br>(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# 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): | |

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| **WATER BODY NAME:** | **EEL RIVER HU, LOWER EEL RIVER HA (INCLUDES THE EEL RIVER DELTA)** |
| **Water Body ID:** | **CAR1111103219980709182643** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12333** |
| **Pollutant:** | **ALUMINUM** |
| **Final Listing Decision:** | **List on 303(d) list (TMDL required list)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Natural Sources |
| **Expected TMDL Completion Date:** | 2021 |
| **Pollutant or Pollution:** | Pollutant |
| **Weight of Evidence:** | This listing applies to the mainstem Eel River in the Lower Eel River HA (includes the Eel River Delta).<br><br>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.<br><br>Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water body-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. 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) Four of the 15 Aluminum samples exceed the water quality objective 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 conclude 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 12333**

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| **LOE ID:** | **25379** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |

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| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 15 |
| Number of Exceedances: | 4 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Four of the 15 aluminum samples collected from the Lower Mainstem Eel River exceed the objective. Sample concentrations range from 6.26 to 3,618 ug/L. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 Lower Mainstem Eel River at Holmes (SWAMP Station ID 111EELHOL). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | Samples were collected from 14 site visits from February 2002 to June 2005. Most of 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 (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) |

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| **WATER BODY NAME:** | **EEL RIVER HU, LOWER EEL RIVER HA, (INCLUDES THE 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 Completion Date:** | 2021 |
| **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.<br><br>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).<br><br>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**

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|---|---|
| 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, incubation, and emergence occurring and 2) spawning, incubation, and emergence occurring. Information on the timing of spawning, incubation, and emergence 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, incubation, and emergence 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, incubation, and emergence 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: | A History of the Salmonid Decline in the Russian River<br>Data for Dissolved Oxygen in McNulty Slough, December 2004 to December 2006. Table Bluff Reservation - Wiyot Tribe |
| 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: | 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 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 |

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| | 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 |

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| **WATER BODY NAME:** | **EEL RIVER HU, MIDDLE FORK HA, EDEN VALLEY AND ROUND VALLEY HSAs** |
| **Water Body ID:** | **CAR1117104419980710113432** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12329** |
| **Pollutant:** | **ALUMINUM** |
| **Final Listing Decision:** | **List on 303(d) list (TMDL required list)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Natural Sources |
| **Expected TMDL Completion Date:** | 2021 |
| **Pollutant or Pollution:** | Pollutant |
| **Weight of Evidence:** | This listing applies to the mainstem of the Middle Fork Eel River in the Middle Fork HA, Eden Valley, and Round Valley HSAs.<br><br>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.<br><br>Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water body-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. 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 18 Aluminum samples exceed the water quality objective 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 conclude 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 12329**

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|---|---|
| **LOE ID:** | **25374** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |

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|---|---|
| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 18 |
| Number of Exceedances: | 2 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Two of the 18 aluminum samples collected from the Middle Fork Eel River exceed the objective. Sample concentrations range from 5.78 to 2,548.00 ug/L. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 Middle Fork Eel River at Dos Rios (SWAMP Station ID 111MFKEEL). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | Samples were collected from March 2001 to June 2006. Most of 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 (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) |

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| **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 delist). 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.

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| **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 16171**

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|---|---|
| **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): | |

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|---|---|
| **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.<br><br>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 Hyrdologic 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 |

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| 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 |

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| **WATER BODY NAME:** | **EEL RIVER HU, MIDDLE MAIN HA** |
| **Water Body ID:** | **CAR1114106119990601095147** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12331** |
| **Pollutant:** | **ALUMINUM** |
| **Final Listing Decision:** | **List on 303(d) list (TMDL required list)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Natural Sources |
| **Expected TMDL Completion Date:** | 2021 |
| **Pollutant or Pollution:** | Pollutant |
| **Weight of Evidence:** | This listing applies to the mainstem of the Eel River in the Middle Main HA.<br><br>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.<br><br>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. 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) Four of the 24 Aluminum samples exceed the water quality objective 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 conclude that the water segment-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 12331**

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| **LOE ID:** | **25376** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Municipal & Domestic Supply |

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| Number of Samples: | 24 |
| Number of Exceedances: | 4 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Four of the 24 aluminum samples collected from the Middle Mainstem Eel River exceed the objective. Sample concentrations range from 3.69 to 2,884.00 ug/L. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 Middle Mainstem Eel River at 2 locations as follows: (1) near Alderpoint (SWAMP Station ID 111EELALD), and (2) above Dyerville (SWAMP Station ID 111EELMDV). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | At the Alderpoint site, samples were collected from March 2002 to June 2002. At the Dyerville site, samples were collected from March 2001 to June 2006. Most of 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 (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) |

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| **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 delist). 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.

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| **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**

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| **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 TMDLs 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 |

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| | 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 |

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| **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 |
| 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: | |

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

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|---|---|
| **WATER BODY NAME:** | **EEL RIVER HU, SOUTH FORK HA** |
| **Water Body ID:** | **CAR1113103019980710155233** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12332** |
| **Pollutant:** | **ALUMINUM** |
| **Final Listing Decision:** | **List on 303(d) list (TMDL required list)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Natural Sources |
| **Expected TMDL Completion Date:** | 2021 |
| **Pollutant or Pollution:** | Pollutant |
| **Weight of Evidence:** | This listing applies to the mainstem South Fork Eel River in the South Fork Eel River HA. The listing does not include Elder Creek, or any other tributaries in the HA.<br><br>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. Two lines of evidence is available in the administrative record to assess this pollutant: one for the South Fork Eel River (LOE 25377) which reflects impairment, and one for Elder Creek (LOE 25378) which does not reflect impaired conditions.<br><br>Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing the mainstem South Fork Eel River on the section 303(d) list as impaired by Aluminum in the Water Quality Limited Segments category. 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 37 Aluminum samples from the South Fork Eel River exceed the water quality objective 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 conclude that the mainstem South Fork Eel River should be placed on the section 303(d) list for Aluminum impairment 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 12332**

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|---|---|
| **LOE ID:** | **25378** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |

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| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Municipal & Domestic Supply |
| 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 aluminum samples collected from Elder Creek exceed the objective. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 Elder Creek (SWAMP Station ID 111ELDRCR). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | Samples were collected from 19 site visits from February 2002 to June 2006. Most of 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 (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) |

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|---|---|
| **LOE ID:** | **25377** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 37 |
| Number of Exceedances: | 6 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Six of the 37 aluminum samples collected from the South Fork Eel River exceed the objective. Sample concentrations range from 3.46 to 3,400.00 ug/L. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 South Fork Eel River at 3 locations as follows: (1) near Branscomb (SWAMP Station ID 111EELBRN), (2) near Benbow (SWAMP Station ID 111EELBEN), and (3) downstream of Bull Creek (SWAMP Station ID 111EELSFK). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | At the Branscomb site, samples were collected from 13 site visits from February 2002 to April 2005. At the Benbow site, samples were collected from 4 site visits from February to June 2002. At the site downstream of Bull Creek, samples were collected from 23 site visits from March 2001 to June 2006. Most of 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 (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) |

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| **WATER BODY NAME:** | **EUREKA PLAIN HU, HUMBOLDT BAY** |
| **Water Body ID:** | **CAB1100000020020108173626** |
| **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 delist). 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**

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| **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.<br><br>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). |

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| Data Reference: | Data for Dioxins and Furans in Humboldt Bay, March to October 2002. Compiled by the State Water Resources Control Board. |
| 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-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. |
| 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): | |

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| **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. |

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| | 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 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. |
| 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 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): | 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 |

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| **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-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. |
| 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. |

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| 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): | |

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| **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-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. |
| 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 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 |

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| | 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 EnviroNet 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): | 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 |

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| **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 |

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| | Report. Prepared for US. Army Engineering District San Francisco Corps of Engineers. Final Revision September 1994 |

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| **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-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 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). |

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| 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 |

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| **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). |

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| 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 |

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| **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 Kinnetic 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 Kinnetic 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. |

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| 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 |

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| **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-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. |
| 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. |

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| 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 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 |

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| **WATER BODY NAME:** | **COPCO LAKE** |
| **Water Body ID:** | **CAL10538021200207201339 12** |
| **Water Body Type:** | **Lake & Reservoir** |
| **DECISION ID** | **13972** |
| **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 Copco 1 and Copco 2 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.

The LOE for microcystin toxin in the water column (LOE 26004) has an evaluation guideline (WHO 2003) that meets the requirements of the Listing Policy. The LOE for microcystin toxin in fish tissue (LOE 25754) has an evaluation guideline (Alexeff 2008) that State Water Board staff believes does not meet the requirements of the Listing Policy, due to the fact that the guideline has not been peer-reviewed or published in an official OEHHA agency document. Therefore, only data from LOE 26004 for microcystin in the water column were utilized to assess this pollutant. Data from LOE 25754 on microcystin in fish tissue are as follows, but were not utilized to assess this pollutant: twenty-one out of 22 tissue microcystin toxin samples exceeded the evaluation guideline (Alexeff 2008).

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 delist). 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) Four out of 13 water column microcystin toxin samples exceed the WHO (2003) evaluation guideline used to interpret the water quality objective. (3) Any exceedance of the evaluation guidelines indicates non-

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| | 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**

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| **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. Additionally, four of the 13 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. 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: | 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<br>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. |

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| Objective/Criterion Reference: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| Evaluation Guideline: | Per the World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan" (Karuk 2009). |
| QAPP Information Reference(s): | Draft Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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. |

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| 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, Ph.D, 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. |

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| **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.

The LOE for microcystin toxin in the water column (LOE 26006) has an evaluation guideline (WHO 2003) that meets the requirements of the Listing Policy. The LOE for microcystin toxin in tissue (LOE 25755) has an evaluation guideline (Alexeff 2008) that State Water Board staff believes does not meet the requirements of the Listing Policy, due to the fact that the guideline has not been peer-reviewed or published in an official OEHHA agency document. Therefore, only data from LOE 26006 for microcystin in the water column were utilized to assess this pollutant. Data from LOE 25755 on microcystin in tissue are as follows, but were not utilized to assess this pollutant: Eight out of 25 tissue microcystin toxin samples exceeded the evaluation guideline (Alexeff 2008).

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 delist). 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) Seven out of 14 water column microcystin toxin samples exceed the evaluation guideline 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**

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| **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: | 7 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Seven of the 14 microcystin samples collected in Iron Gate Reservoir exceed the evaluation guideline. Additionally, ten of the 14 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. 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: | 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<br>Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008 |

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| 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: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| Evaluation Guideline: | Per the World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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 |

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| | 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, Ph.D, 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 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): | 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. |

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| **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.

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 17 water column microcystin toxin samples exceed the evaluation guidelines used to interpret the water quality objective. None of 36 water column Microcystis cell samples exceed the evaluation guideline used to interpret the water quality objective.

(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 not be placed on the Section 303(d) List because applicable water quality standards are not being exceeded.

**SWRCB Board Decision / Staff Recommendation:**

**USEPA Decision:**

**Lines of Evidence (LOEs) for Decision ID 13976**

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| **LOE ID:** | **26043** |
| **Pollutant:** | **Cyanobacteria hepatotoxic microcystins** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 17 |
| Number of Exceedances: | 0 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | None of the 17 microcystin samples collected in 2007 exceeded the evaluation guideline. Additionally, none of the 17 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. Sample concentrations range from less than the quantitation 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). |
| Data 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<br>Final 2007 Klamath River Blue-Green Algae Summary Report. 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 World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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 Terwar 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 6 occasions between July 24, 2007 and October 15, 2007. |

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| 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<br>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program |

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| **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: | 0 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | None of the 36 samples analyzed for Microcystis cells collected in the mainstem Klamath River exceed the evaluation guideline. Additionally, one of the 36 samples analyzed for Microcystis cells exceeded the Blue Green Algae Work Group (2008) guideline of 40,000 Microcystis cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. 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: | 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<br>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program<br>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. |

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| Objective/Criterion Reference: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| Evaluation Guideline: | Per the World Health Organization (WHO 2003): The recommended guideline for Microcystis cells in recreational waters associated with a moderate probability of adverse health effects is 100,000 cells/ml. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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 Terwar 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<br>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program |

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| **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 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, 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.

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 delist). 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, and 2003). See LOE 26467.

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

(4) 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.

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

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

(7) 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:** **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. Additionally, zero of the 3 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. 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: 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
Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008

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| 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 World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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.<br><br>In 2005: 30 out of 77 aqueous samples for microcystins (MC) exceed the WHO moderate health risk guideline value of 20 ug/L.<br><br>In 2006: 35 out of 72 aqueous samples for MC exceeded the WHO guideline of 20 ug/L.<br><br>In 2007: 34 out of 110 aqueous samples for MC exceeded the WHO guideline |

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| | of 20 ug/L.<br><br>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." |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | 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." |
| Objective/Criterion Reference: | Water Quality Control Plan For The North Coast Region |
| Evaluation Guideline: | World Health Organization (WHO) recommended guideline value of 20 ug/L for aqueous microcystins toxins in recreational waters. |
| Guideline Reference: | 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 |
| Spatial Representation: | 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. |
| Temporal Representation: | Data were collected annually for three years: during 2005, 2006 and 2007. |
| Environmental Conditions: | The USEPA report summary indicates prolonged bluegreen algae blooms during summer months when samples are collected. |
| QAPP Information: | 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. |
| QAPP Information Reference(s): | 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<br>Organ Distribution and Bioaccumulation of Microcystins in Freshwater Fish at Different Trophic Levels from the Eutrophic Lake Chaohu, China. Environ. Toxicol. 20, 293-300<br>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 |

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| **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.

The LOEs for microcystin toxin in the water column (LOE 25995) and Microcystis cells/ml in the water column (LOE 26055) have evaluation guidelines (WHO 2003) that meet the requirements of the Listing Policy. The LOE for microcystin toxin in tissue (LOE 25846) has an evaluation guideline (Alexeff 2008) that State Water Board staff believes does not meet the requirements of the Listing Policy, due to the fact that the guideline has not been peer-reviewed or published in an official OEHHA agency document. Therefore, only data from LOEs 25995 and 26055 for microcystin and Microcystis in the water column were utilized to assess this pollutant. Data from LOE 25846 on microcystin in tissue are as follows, but were not utilized to assess this pollutant: one out of 4 tissue microcystin toxin samples exceeded the evaluation guideline (Alexeff 2008).

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) Three of 31 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**

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| **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. Additionally, four of the 14 samples analyzed for Microcystis cells exceeded the Blue Green Algae Work Group (2008) guideline of 40,000 Microcystis cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. 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: | 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<br>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 |

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| | 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 World Health Organization (WHO 2003): The recommended guideline for Microcystis cells in recreational waters associated with a moderate probability of adverse health effects is 100,000 cells/ml. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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. Grab samples were collected at the Beaver Creek Fish Disease site and Brown Bear River Access on 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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. |

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| 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, Ph.D, 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. |

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| **LOE ID:** | **25995** |
| **Pollutant:** | **Cyanobacteria hepatotoxic microcystins** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 31 |
| Number of Exceedances: | 3 |

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| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Three of the 31 microcystin samples collected in the mainstem Klamath River between the Iron Gate Dam and the Scott River in 2008 exceed the evaluation guideline. Additionally, four of the 31 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. 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: | 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<br>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 World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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. Grab samples were collected at the Beaver Creek Fish Disease Site and Brown Bear River Access on 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-Monitoring Plan). |
| QAPP Information Reference(s): | Draft Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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.

The LOEs for microcystin toxin in the water column (LOEs 26042 and 25997) and Microcystis cells/ml in the water column (LOEs 26056 and 26007) have evaluation guidelines (WHO 2003) that meet the requirements of the Listing Policy. The LOE for microcystin toxin in tissue (LOE 25847) has an evaluation guideline (Alexeff 2008) that State Water Board staff believes does not meet the requirements of the Listing Policy, due to the fact that the guideline has not been peer-reviewed or published in an official OEHHA agency document. Therefore, only data from LOEs 26042, 25997, 26056, and 26007 for microcystin and Microcystis in the water column were utilized to assess this pollutant. Data from LOE 25847 on microcystin in tissue are as follows, but were not utilized to assess this pollutant: four out of 13 tissue microcystin toxin samples exceeded the evaluation guideline (Alexeff 2008).

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 2 of 21 water column microcystin toxin samples (LOEs 26042 and 25997), and 4 of 26 water column Microcystis cell samples (LOEs 26056 and 26007) 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**

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| **LOE ID:** | **25997** |
| **Pollutant:** | **Cyanobacteria hepatotoxic microcystins** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 15 |
| Number of Exceedances: | 2 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Two of the 15 microcystin toxin samples collected from the mainstem Klamath River exceed the objective. Additionally, two of 15 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect the recreational exposure of a child. 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: | 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<br>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 |

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| | 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 World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| Spatial Representation: | Samples were collected in the mainstem Klamath River between the Scott River and the Trinity River at 5 locations as follows: (1) at the Rocky Point River Access, (2) at Orleans, (3) at Seiad Valley, (4) at the Seiad Valley Fish Disease Site, and (5) at the mining claim river access upstream of Seiad Valley. |
| 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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. |

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| 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, Ph.D, 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. |

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| **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. Additionally, none of the 6 microcystin samples exceeded the Blue Green Algae Work Group (2008) guideline for microcystin toxin of 8 ug/L to protect |

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| | the recreational exposure of a child. 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: | 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<br><br>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program<br><br>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 World Health Organization (WHO 2003): The recommended guideline for microcystin toxin in recreational waters associated with a moderate probability of adverse health effects is 20 ug/L. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| 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): | Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates |

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| **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: | 0 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | None of the 14 samples analyzed for Microcystis cells collected in the mainstem Klamath River exceeds the evaluation guideline. Additionally, one of the 14 samples analyzed for Microcystis cells exceeded the Blue Green Algae Work Group (2008) guideline of 40,000 Microcystis cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. 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: | 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<br>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program<br>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 World Health Organization (WHO 2003): The recommended guideline for Microcystis cells in recreational waters associated with a moderate probability of adverse health effects is 100,000 cells/ml. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| Spatial Representation: | Samples were collected in the mainstem Klamath River at Weitchpec |

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| | 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): | Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates |

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| **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 and 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. Additionally, four of 12 samples analyzed for Microcystis cells exceeded the Blue Green Algae Work Group (2008) guideline of 40,000 Microcystis cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. Microcystis cell concentrations range from 1,147 to 316,828 cells/ml. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data). |
| Data 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<br>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 World Health Organization (WHO 2003): The recommended guideline |

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| | for Microcystis cells in recreational waters associated with a moderate probability of adverse health effects is 100,000 cells/ml. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin. |
| Guideline Reference: | World Health Organization. 2003. Guidelines for Safe Recreational Water Environments: Volume 1 Coastal and Freshwaters. |
| Spatial Representation: | Samples were collected in the mainstem Klamath River between the Scott River and the Trinity River at 5 locations as follows: (1) at the Rocky Point River Access, (2) at Orleans, (3) at Seiad Valley, (4) at the Seiad Valley Fish Disease Site, and (5) at the mining claim river access upstream of Seiad Valley. |
| 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 Mid-Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program. |

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| **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 Beaver Creek, Cow Creek, Deer Creek, Hungry Creek, and West Fork Beaver Creek 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 Beaver Creek, Cow Creek, Deer Creek, Hungry Creek, and West Fork Beaver Creek do not attain sediment objectives and/or evaluation guidelines, in compliance with Section 3.11 of the Listing Policy, as described below:

Primary evidence:
(1) Beaver Creek exceeds the percent fines (LOE 25689) and embeddedness (LOE 25690) guidelines.
(2) Cow Ck exceeds the percent fines (LOE 25689) and embeddedness (LOE 25690) guidelines.
(3) Deer Ck exceeds the percent fines (LOE 25689) and embeddedness (LOE 25690) guidelines.
(4) Hungry Ck exceeds the percent fines (LOE 25689) and embeddedness (LOE 25690) guidelines.
(5) West Fork Beaver Ck exceeds the percent fines (LOE 25689) and embeddedness (LOE 25690) guidelines.

Supporting evidence:
(1) Beaver Creek Watershed 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) The following subwatersheds in the Beaver Creek Watershed exceed the road density (LOE 25709) guideline: Buckhorn Creek Subwatershed, Bumblebee Creek Subwatershed, Cow Creek Subwatershed, Hungry Creek Subwatershed, Grouse Creek Subwatershed, West Fork Beaver Creek Subwatershed.

Evidence not incorporated in final decision:

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| | Modeling data from the USFS (LOEs 25717, 25713, 25714, 25719, and 25688) pertaining to landslide volumes, ERA/TOC ratios, and surface erosion values are not being incorporated in this decision as public comments submitted on the Integrate Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.<br><br>(B) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.<br><br>(C) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.<br><br>(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 conclude that Beaver Creek, Cow Creek, Deer Creek, Hungry Creek, and West Fork Beaver Creek 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**

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| **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: | 5 of 5 waterbodies 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 | Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment |

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| Objective/Criterion: | 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 Stated Department of Agriculture Forest Service<br>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 waterbodies in the Beaver Creek Watershed. The 5 waterbodies located within California are: Beaver Creek, West Fork Beaver Creek, Deer Creek, Hungry Creek, and Cow Creek. The 2 waterbodies 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): | Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp |

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| **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 and Information Type: | HABITAT ASSESSMENT |
| Data Used to Assess Water Quality: | 5 of 5 waterbodies 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 |

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| | 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 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 Stated Department of Agriculture Forest Service<br>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 waterbodies in the Beaver Creek Watershed. The 5 waterbodies located in California are Beaver Creek, West Fork Beaver Creek, Deer Creek, Hungry Creek, and Cow Creek. The 2 waterbodies 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): | Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp |

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| **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 |

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| 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 Process Paper. 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, 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 |

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| | 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<br>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC.<br>CWE 2004. Cumulative Watershed Effects Analysis Process Paper. Klamath National Forest |

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| **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 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.<br>CWE 2004. Cumulative Watershed Effects Analysis Process Paper. Klamath National Forest |
| 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. |

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

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| **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 back ground to 1,061% over background. Volumes are 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): Surface erosion volumes of 400% over background conditions as computed by USFS Universal Soil Loss Equation Model indicate the inference point where 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 Process Paper. 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 Universal Soil Loss Equation |

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| QAPP Information Reference(s): | Model conducted by staff of the Klamath National Forest in 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 Process Paper. Klamath National Forest |

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| **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 Process Paper. 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 |

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| | 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 Process Paper. Klamath National Forest |

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| **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 Process Paper. 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 |

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| | 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 Process Paper. Klamath National Forest |

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| **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 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 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): | |

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| **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): | |

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| **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: | 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 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 Process Paper. Klamath National Forest |

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| **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 China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, and Walker Creek on the Section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:<br><br>(A) The weight of evidence demonstrates that sediment conditions in China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, and Walker Creek do not attain sediment objectives and/or evaluation guidelines, in compliance with Section 3.11 of the Listing Policy, as described below:<br><br>Primary evidence:<br>(1) China Creek exceeds the embeddedness (LOE 25692) guideline.<br>(2) Fort Goff Ck exceeds the embeddedness (LOE 25692) guideline.<br>(3) Grider Ck exceeds the percent fines (LOE 25693) and embeddedness (LOE 25692) guidelines.<br>(4) Portuguese Ck exceeds the embeddedness (LOE 25692) guideline.<br>(5) Thompson Ck exceeds the percent fines (LOE 25693) and embeddedness (LOE 25692) guidelines.<br>(6) Walker Ck exceeds the percent fines (LOE 25693) guideline.<br><br>Supporting evidence:<br>(1) Grider Ck and Walker Ck show pool reduction as a result of the flood of 1997 (LOE 25701), which exceeds the sediment objective.<br><br>Evidence not incorporated in final decision:<br>Modeling data from the USFS (LOEs 25696, 25697, and 25698) pertaining to landslide volumes, ERA/TOC ratios, and surface erosion values are not being incorporated in this decision as public comments submitted on the Integrate Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary |

evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.

(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 China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, and Walker Creek 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**

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| **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: | 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 |

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

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| **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 waterbodies 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 waterbodies that exceed the evaluation guideline are Thompson Creek, Walker Creek, and Grider Creek. Samples were collected by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis" (USFS 1999). |

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| 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 Stated Department of Agriculture Forest Service<br>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 waterbodies 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. |
| 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 |

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| **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 |

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| Data and Information Type: | HABITAT ASSESSMENT |
| Data Used to Assess Water Quality: | Five of the 7 waterbodies 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 waterbodies that exceed the evaluation guideline are China Creek, Thompson Creek, Grider Creek, Portuguese Creek, and Fort Goff Creek. 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 Stated Department of Agriculture Forest Service<br>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 waterbodies 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. |
| 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 |

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| **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): | |

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| **LOE ID:** | **25698** |
| **Pollutant:** | **Sediment** |
| LOE Subgroup: | Adverse Biological Responses |
| Matrix: | -N/A |
| Fraction: | None |

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| 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: | 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 "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 Process Paper. Klamath National Forest |
| 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): | Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District |

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| **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: | 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 "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): A risk ratio was calculated by dividing model-estimated sediment delivery from surface erosion by model background (background=400%). A 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 Process Paper. Klamath National Forest |
| 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 |

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| | 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 |

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| **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. Zero primary lines of evidence, three supporting lines of evidence, and two lines of evidence that were not utilized in this decision are available in the administrative record to assess this pollutant.

Primary evidence:
No instream data available.

Supporting evidence:
One line of evidence (LOE 25702), which is a conclusion statement about visual observations, 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. According to the Listing Policy, section 3.8, visual assessments may only be used as secondary/supporting lines of evidence. Two lines of evidence (LOEs 26340 and 26341) show that road densities in the Upper South Fork Salmon River Watershed and North Fork Salmon River Watershed do not exceed the evaluation guideline as it applies to the sediment objective.

Evidence not incorporated in final decision:
Modeling data (LOEs 7460 and 9130) pertaining to landslide volumes, and surface erosion values are not being incorporated in this decision as public comments submitted on the Integrate Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.

Based on the readily available data and information, there is insufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that (1) there is no primary evidence available to justify this listing, (2) only three supporting lines of evidence are available and two of those reflect no impairment, (3) the documents submitted do not contain substantial information for listing, more data is needed to determine if the water quality objective is exceeded, and (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 for the pollutant are not exceeded.

**SWRCB Board Decision / Staff Recommendation:**

**USEPA Decision:**

**Lines of Evidence (LOEs) for Decision ID 13255**

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| **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: | 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 |

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| | 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 Process Paper. Klamath National Forest |
| 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 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 Process Paper. Klamath National Forest |

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| **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 |

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| 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 Process Paper. 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 Conditions: | Most of the modeled sediment increase from the Klamath National Forest models is 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 Process Paper. Klamath National Forest |

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| **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" |

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| | 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 Process Paper. Klamath National Forest |

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| **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 |

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| | 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 Process Paper. Klamath National Forest |

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|---|---|
| **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 |

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| 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. 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): | |

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| **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:** | **Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Erosion/Siltation \| Removal of Riparian Vegetation |
| **TMDL Name:** | Salmon River |
| **TMDL Project Code:** | 109 |
| **Date TMDL Approved by USEPA:** | 03/29/2006 |
| **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 may be 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, however two of these lines of evidence were not incorporated into this decision for the reasons described below.

Evidence not incorporated in final decision:
(1) Modeling data from the USFS (LOE 21156) pertaining to landslide volumes and surface erosion values are not being incorporated in this decision as public comments submitted on the Integrate Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.
(2) Information on the percent of human disturbance in the Wooley Creek watershed (LOE 21155) are not being incorporated into this decision as public comments submitted on the Integrated Report included new information that there may be more disturbance in the watershed than was indicated in the LOE. The new information was submitted during the public comment period and will be considered in the next listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. There is sufficient justification to place it in the Being Addressed portion of the 303(d) list because a TMDL has been completed and approved by the Regional Water Board and USEPA, and is expected to result in attainment of the standard.

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) 15 of 15 MWMT values exceed the U.S. EPA (2003) 16 C evaluation guideline used to determine an adverse affect on beneficial uses. These exceedances are more than the allowable frequency in Table 4.2 of the Listing Policy. (4) The "Salmon River, Siskiyou County, California Total Maximum Daily Load for Temperature and Implementation Plan" was adopted by the Regional Water Board on June 22, 2005, and established by the U.S. EPA on March 29, 2006. The TMDL establishes targets for effective shade. Compliance with the effective shade targets constitutes compliance with the TMDL, and reflects achievement of the natural receiving water temperature objective. Regional Water Board staff are unaware of data that demonstrates whether the TMDL effective shade targets are being met. (5) 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, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because it can not be determined whether the applicable water quality standards for the pollutant are being met.

**SWRCB Board Decision / Staff Recommendation:**

**USEPA Decision:**

**Lines of Evidence (LOEs) for Decision ID 9540**

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| **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: | |

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

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| **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: | Wooley Creek Model Data Following the 2006 Wildfires (2007 model year) |
| 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 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: | Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis Process Paper. Klamath National Forest |
| Spatial Representation: | The Klamath National Forest models are specific to the Wooley Creek |

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| | watershed. |
| Temporal Representation: | Model results are based on data collected following the 2006 wildfires for the 2007 model year. |
| Environmental Conditions: | The data were collected following the 2006 wildfires for the 2007 model year. |
| 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 Process Paper. Klamath National Forest |

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| **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: | 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 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: | 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 |

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| | 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: | 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 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): | |

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| **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: | Land use information and location of sources |
| 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<br>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 |

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| | 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 Hydrologic Sub-Area. |
| Temporal Representation: | 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: | The road density data from the Klamath National Forest are based on data collected following the 2006 wildfires for the 2007 model year. There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to the data from the Salmon River TMDL. |
| 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): | Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis Process Paper. Klamath National Forest |

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| **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: | 15 |

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| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | According to the Salmon River TMDL (NCRWQCB 2005), stream temperature in the Salmon River Watershed, including the Wooley Creek HSA, have been altered by changes in riparian cover, increased solar heating, changes in streamside microclimates, and sediment delivery -- through processes such as channel aggradation and pool infilling. Therefore, the natural receiving water temperature of Wooley Creek has been altered by human activities, and 15 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: | 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<br><br>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<br><br>Map of Temperature Monitoring Stations. Klamath National Forest |
| 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: | 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: | 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: | The Klamath National Forest models are specific to the Wooley Creek |

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| | 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): | Memorandum from John Schuyler, Klamath Nation Forest, to Rebecca Fitzgerald, North Coast Regional Water Quality Control Board, Regarding the 303(d) DeListing Request |

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| **WATER BODY NAME:** | **KLAMATH RIVER HU, SCOTT RIVER HA** |
| **Water Body ID:** | **CAR1054103519980707120412** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **16743** |
| **Pollutant:** | **DDT** |
| **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 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 DDT samples collected in the mainstem Scott River were reported as detected not quantifiable (DNQ) and both sample concentrations exceed the evaluation guideline. The DNQ sample concentrations were reported as estimated values: .0027 ug/l and .003 ug/l (method detection limit of 0.002 ug/l, reporting limit of .005 ug/l).

There were an additional 21 samples from the mainstem Scott River, which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDT is above the evaluation guideline. Per the listing policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis.

The two DNQ values of DDT occurred in 2002 and 2003, and all 14 subsequent DDT samples taken in the mainstem Scott River from April 2003 to June 2006 have been non-detect. Additionally, there have been 6 samples collected since June 2006, all of which were non-detect.

Based on the readily available data and information, Regional Water Board staff have determined that there is sufficient justification to not place this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category at this time. The lack of any DDT "detections" in any watershed in the North Coast Region since 2003 has raised questions about the validity of the data from 2002 and 2003. Thus, Regional Water Board staff do not propose utilizing this information as the sole basis for listing. Additional sampling for DDT in the Scott River will be conducted as part of SWAMP. When this additional DDT data becomes available it will be assessed in future listing cycles, and the determination not to list the Scott River for DDT will be re-evaluated.

**RWQCB Staff Recommendation:**

After review of the available data and information, RWQCB staff recommends that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

**SWRCB Board Decision / Staff**

**Recommendation:**

**USEPA Decision:**

**Lines of Evidence (LOEs) for Decision ID 16743**

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| **LOE ID:** | **25615** |
| **Pollutant:** | **DDT** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 2 |
| Number of Exceedances: | 2 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Two DDT samples collected in the mainstem Scott River had DNQ levels of DDT and both samples exceed the evaluation guideline. Both sample concentrations were detected not quantifiable (DNQ), with estimated values of .0027 ug/l and .003 ug/l (method detection limit of 0.002 ug/l, reporting limit of .005 ug/l). There were also an additional 21 samples which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDT is above the evaluation guideline. Per the listing policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis. It should also be noted that the two DNQ values of DDT occurred in 2002 and 2003, and all 14 subsequent DDT samples taken in the mainstem Scott River from April 2003 to June 2006 have been non-detect. Additionally there have been 6 samples collected since June 2006 all of which were non-detect. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP) (NCRWQCB 2008). |
| Data Reference: | Surface Water Ambient Monitoring Program (SWAMP). DDT, DDE, and DDD data from SWAMP Sampling for Years 2001-2006. North Coast Regional Water Quality Control Board. |
| 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: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| 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: | National Recommended Water Quality Criteria. United States Environmental |

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| | Protection Agency. Office of Water. Office of Science and Technology. 4304T |
| Spatial Representation: | Samples were collected from the mainstem Scott River from 3 locations as follows: (1) at Callahan (SWAMP Station ID 105SCOTCA), (2) at Jones Beach (SWAMP Station ID 105SCOTJB), and (3) near the Klamath River (SWAMP Station ID 105SCOTSH). Samples were collected as grab samples from well-mixed flows in glides or riffles. |
| Temporal Representation: | At the Callahan site, samples were collected from February 2002 to June 2003. At the Jones Beach sites, samples were collected from May 2002 to June 2003. At the site near the Klamath River, samples were collected from March 2001 to June 2006. Most of 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): | 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) |

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| **WATER BODY NAME:** | **SHASTINA, LAKE** |
| **Water Body ID:** | **CAL105500772002072013471 5** |
| **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 Completion Date:** | 2021 |
| **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 by the Department of Water Resources 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).

Data on mercury in fish tissue was collected by the SWAMP program in 2007, however these data were not available for use in this listing cycle because (1) the data were collected after the close of the public solicitation period for new data for this listing cycle and (2) these data are draft and are still undergoing the SWAMP required final quality assurance review. Although the data have not been finalized, the draft SWAMP data suggest that fish tissue mercury concentrations exceeds the evaluation guideline of 0.3 mg/kg. These data will be considered in the next listing cycle.

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**

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| **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 risk assessment 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 that sport fishing occurs in Lake Shastina (CA Lake Maps 2002, Lake Shastina Property Owners Association 2006), and it is reasonable and responsible to assume that fish caught are consumed. |
| Data Reference: | Mercury Contamination in Fish from Northern California Lakes and Reservoirs. State of California. The Resources Agency. Department of Water Resources. Northern District. July 2007<br>Data for Mercury Tissue in Northern California Lakes, 2000-2001<br>California Lake Maps. Downloaded from http://www.fishersnet.com/fishmap.html#A145 on 10/13/2008<br>Lake Shastina & Siskiyou County Facts & Figures. As of December 31, 2006 |
| 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. |

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| Objective/Criterion Reference: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| 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: | Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene<br>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 |
| 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), "Mercury Bioaccumulation Assessment in Northern California Lakes and Reservoirs" (DWR 2000b), and "Fish Tissue Collection Protocol (DWR North District)" (DWR 2000a). Additional QA/QC information is available from a Personal Communication with Scott McReynolds of the California Department of Water Resources (DWR 2009). |
| QAPP Information Reference(s): | Mercury Contamination in Fish from Northern California Lakes and Reservoirs. State of California. The Resources Agency. Department of Water Resources. Northern District. July 2007<br>California Department of Water Resources. 2000a. Fish Tissue Collection Protocol (DWR Northern District).<br>California Department of Water Resources. 2000b. Mercury Bioaccumulation Assessment in Northern California Lakes and Reservoirs. Workplan for the 2000-02 Fiscal Years.<br>Personal Communication from Scott McReynolds (California Department of Water Resources) to Steve Butkus (Regional Water Board staff). April 14, 2009. Discussion of QA/QC for Lake Shastina mercury in fish tissue sampling. |

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| **WATER BODY NAME:** | **MAD RIVER HU, MAD RIVER** |
| **Water Body ID:** | **CAR10910011199807061551 40** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12851** |
| **Pollutant:** | **DDE** |
| **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 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.

One DDE sample collected in the mainstem Mad River was detected at a level of .004 ug/l, and the other sample concentration was detected not quantifiable (DNQ), with estimated value of .001 ug/l (method detection limit of 0.001 ug/l, reporting limit of .002 ug/l). Both sample concentrations exceed the evaluation guideline.

There were also an additional 10 samples from the mainstem Mad River, which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDE is above the evaluation guideline. Per the listing policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis.

The one detection of DDE occurred in 2002 and the one DNQ of DDE occurred in 2003. All 9 subsequent DDE samples taken in the mainstem Mad River from April 2003 to June 2006 have been non-detect. Additionally, there have been 2 samples collected since June 2006, both of which were non-detect.

Based on the readily available data and information, Regional Water Board staff have determined that there is sufficient justification to not place this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category at this time. The lack of any DDE "detections" in any watershed in the North Coast Region since 2003 has raised questions about the validity of the data from 2002 and 2003. Thus, Regional Water Board staff do not propose utilizing this information as the sole basis for listing. Additional sampling for DDE in the Mad River will be conducted as part of SWAMP. When additional DDE data become available it will be assessed in future listing cycles, and the determination not to list the Mad River for DDE will be re-evaluated.

**RWQCB Staff Recommendation:**

After review of the available data and information, RWQCB staff recommends that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

**SWRCB Board Decision**

**/ Staff Recommendation:**

**USEPA Decision:**

**Lines of Evidence (LOEs) for Decision ID 12851**

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| **LOE ID:** | **25604** |
| **Pollutant:** | **DDE** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 2 |
| Number of Exceedances: | 2 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Two DDE samples collected in the mainstem Mad River had detectable levels of DDE (although one was DNQ) and both samples exceed the evaluation guideline. One sample concentration was reported as .004 ug/L and the other sample concentration was detected not quantifiable (DNQ), with estimated value of .001 ug/l (method detection limit of 0.001 ug/l, reporting limit of .002 ug/l). There were also an additional 10 samples from the mainstem Mad River, which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDE is above the evaluation guideline. Per the listing policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis. The one detection of DDE occurred in 2002 and the one DNQ of DDE occurred in 2003. All 9 subsequent DDE samples taken in the mainstem Mad River from April 2003 to June 2006 have been non-detect. Additionally, there have been 2 samples collected since June 2006, both of which were non-detect. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP) (NCRWQCB 2008). |
| Data Reference: | Surface Water Ambient Monitoring Program (SWAMP). DDT, DDE, and DDD data from SWAMP Sampling for Years 2001-2006. North Coast Regional Water Quality Control Board. |
| 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: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| 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: | National Recommended Water Quality Criteria. United States Environmental |

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| | Protection Agency. Office of Water. Office of Science and Technology. 4304T |
| 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 runs. |
| 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): | 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) |

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| **WATER BODY NAME:** | **MENDOCINO COAST HU, GUALALA RIVER HA, GUALALA RIVER** |
| **Water Body ID:** | **CAR1138502119980709123111** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **12336** |
| **Pollutant:** | **ALUMINUM** |
| **Final Listing Decision:** | **List on 303(d) list (TMDL required list)** |
| **Last Listing Cycle's Final Listing Decision:** | New Decision |
| **Revision Status** | Revised |
| **Sources:** | Natural Sources |
| **Expected TMDL Completion Date:** | 2021 |
| **Pollutant or Pollution:** | Pollutant |
| **Weight of Evidence:** | This listing applies to the mainstem Gualala River in the Gualala River HA.<br><br>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.<br><br>Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water body-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. 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 18 Aluminum samples exceed the water quality objective 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 conclude 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 12336**

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| **LOE ID:** | **25382** |
| **Pollutant:** | **Aluminum** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Municipal & Domestic Supply |

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| Number of Samples: | 18 |
| Number of Exceedances: | 2 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | Two of the 18 aluminum samples collected from the Gualala River exceed the objective. Sample concentrations range from 11.20 to 4,015.00 ug/L. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the SWAMP Summary Report for the North Coast Region for Years 2000-2006 (NCRWQCB 2008). |
| Data Reference: | 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 |
| Water Quality Objective/Criterion: | Per the Basin Plan (NCRWQCB 2007): The Maximum Contaminant Level for aluminum is 1.0 mg/l (1,000 ug/L). |
| 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 Gualala River at Gualala Regional Park (SWAMP Station ID 113GUAGRP). Samples were collected from well-mixed flows in glides or riffles. |
| Temporal Representation: | Samples were collected as grab samples during 20 sites visits from May 2001 to June 2006. 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 (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) |

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| **WATER BODY NAME:** | **HARE CREEK BEACH** |
| **Water Body ID:** | **CAC113200412008101322291 3** |
| **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 4 exceedances each for enterococcus, fecal coliform, and total coliform single sample values. This also equates to one exceedance 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**

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| **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: | 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 |
| 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 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): | 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 |

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| **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: | 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 |
| 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: | 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 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): | 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 |

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| **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: | 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 |
| 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: | 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 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): | 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 |

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| **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.

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| | (4) The data used satisfies the data quantity requirements of Section 6.1.5 of the Listing Policy.<br>(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**

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| **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 |
| 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<br>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. |

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

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| **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: | Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management<br>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 |

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| | 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: | 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 |

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| **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, |

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| | 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<br>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 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: | 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 |

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| | 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 |

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| **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 ℃ coho threshold, there were 289 exceedances out of 1391 total samples taken over all of the years at this location. When compared to the 17Â℃ threshold there were no excee dances 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 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 5ÂF above natural receiving water temperature . At no time or place shall the temperature of WARM intrastate waters be increased more than 5ÂF above natural receiving water temperature. |
| Objective/Criterion Reference: | Placeholder reference 2006 303(d) |
| Evaluation Guideline: | 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 14.8Â℃ and for steelhead trout as 17.0Â℃. The risk assessment approach used by Sullivan et al. (2000) suggests that an upper threshold for the 7-day average of 14.8Â℃ for coho and 17.0Â℃ |

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| | for steelhead will reduce average growth 10% from optimum. |
| Guideline Reference: | Placeholder reference 2006 303(d) |
| Spatial Representation: | 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. |
| Temporal Representation: | 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. |
| Environmental Conditions: | |
| QAPP Information: | 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. |
| QAPP Information Reference(s): | |

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| **WATER BODY NAME:** | **PUDDING CREEK BEACH** |
| **Water Body ID:** | **CAC1132005020081013224604** |
| **Water Body Type:** | **Coastal & Bay Shoreline** |
| **DECISION ID** | **12178** |
| **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 9 exceedance each for enterococcus, fecal coliform, and total coliform single sample values. This also equates to no more than 2 exceedance each for enterococcus, fecal coliform, and total coliform 30-day geomean values. 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**

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| **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: | 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 |
| 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: | 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 |

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| **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: | 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 |
| 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: | 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. |

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| 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 |

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| **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. 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. |

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| 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 |

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| **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).<br><br>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 18ÂºC 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 25.7ÂºC to 28.3ÂºC.<br><br>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.<br><br>This conclusion is based on staff findings that:<br>(1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.<br>(2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.<br>(3) The evaluation of the data satisfies the temperature data evaluation requirements of Section 6.1.5.9 of the Policy.<br>(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.<br>(5) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met. |

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| **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**

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| **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.<br>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 |

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| 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 |

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| **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): | |

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| **WATER BODY NAME:** | **RUSSIAN RIVER HU, MIDDLE RUSSIAN RIVER HA, GEYSERVILLE HSA** |
| **Water Body ID:** | **CAR1142503219990615082353** |
| **Water Body Type:** | **River & Stream** |
| **DECISION ID** | **13300** |
| **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 Completion Date:** | 2012 |
| **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) Six of 9 single sample enterococcus, 3 of 9 E. single sample Coli, 7 of 7 median fecal coliform, and 0 of 12 single sample total coliform samples exceed the evaluation guidelines. The 6 out of 9 single sample enterococcus and 7 out of 7 median 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

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| **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 |

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| 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: | 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 an 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): | 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 |

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| **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). |

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| 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 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 |

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| **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 |

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| | 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 |

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| **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 |

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| | 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 |

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| **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). |

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| 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 |

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| **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. |

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| 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 |

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| **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: | 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. |

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| 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 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 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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): | 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 |

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| **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: | 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 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. |

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| 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 |

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| **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: | 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/<br>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.<br>*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 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. |

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| 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):

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| **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: | 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/<br>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 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 Healdsburg Memorial Beach near Healdsburg, in front of lifeguard stand 3 at the downstream |

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| | 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 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 |

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| **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/<br>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 |

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| | (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 |

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| **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). |

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| 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/<br>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 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 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): | 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 |

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| **LOE ID:** | **7108** |
| **Pollutant:** | **Total Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 14 |

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| 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 (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 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): | |

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| **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). |

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| 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 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): | |

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| **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/ |
| 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. |

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| 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): | |

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| **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 |

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| | 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 |

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| **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 Water Quality: | All 2 of the 2 total coliform samples collected in Foss Creek exceed the evaluation 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: | 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 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). |

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| QAPP Information Reference(s): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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| **LOE ID:** | **6107** |
| **Pollutant:** | **Enterococcus** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 9 |
| Number of Exceedances: | 6 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | Six of the 9 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 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. |
| 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 |

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| **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 |

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| **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 of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board |

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| **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/<br>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.<br>*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. |

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| 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 |

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| **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: | 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/<br><br>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 |

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| 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 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 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 |

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| **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.<br><br>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.<br><br>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, |

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| | 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.<br><br>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/<br><br>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 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): | 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 |

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| **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: | 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 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): | |

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| **LOE ID:** | **5906** |
| **Pollutant:** | **Fecal Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |

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| 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.<br><br>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.<br><br>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,<br><br>53 median E. coli concentration values were calculated based on a minimum of not less 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.<br><br>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/<br>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: | 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. |

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| 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 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 |

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| **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. Ten out of 11 E. coli and 10 out of 11 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) Ten out of 11 E. coli samples and 10 out of 11 total coliform samples exceed their respective 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 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**

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| **LOE ID:** | **26089** |
| **Pollutant:** | **Escherichia coli (E. Coli)** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |

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| Number of Samples: | 11 |
| Number of Exceedances: | 10 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | Ten of the 11 E. coli samples from the Green Valley Creek Watershed exceed the evaluation guideline. Concentrations range from 100 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: | 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 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): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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| **LOE ID:** | **26090** |
| **Pollutant:** | **Total Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 11 |
| Number of Exceedances: | 10 |

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| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | Ten of the 11 total coliform samples from the Green Valley Creek Watershed exceed the evaluation guideline. The sample concentrations range from 2,600 to > 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: | 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. |
| 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 |

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| **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** |

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| **DECISION ID** | **14380** |

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| **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.<br><br>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).<br><br>This conclusion is based on the staff findings that: (1) Seventeen out of 77 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**

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| **LOE ID:** | **26094** |
| **Pollutant:** | **Oxygen, Dissolved** |
| LOE Subgroup: | Pollutant-Water |

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| 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: | 77 |
| Number of Exceedances: | 17 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | Seventeen of the 77 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).<br><br>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).<br><br>These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2006, and CCWI 2007). |
| Data Reference: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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<br>A History of the Salmonid Decline in the Russian River |
| Water Quality Objective/Criterion: | 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. (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. |
| 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 at 7 sites along the entire mainstem of Green Valley Creek: from Harrison Grade and Green Valley Road to the Russian River confluence. |
| Temporal Representation: | 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. |

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| 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 |

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| **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 delist). 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**

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| **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: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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 |

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| 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 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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 |
| 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. |

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| 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 |

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| **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.<br><br>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.<br><br>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,<br><br>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.<br><br>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). |

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| 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/<br><br>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 |

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| **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 |

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| 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. |
| 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 |

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| **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: | 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 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): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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| **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: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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: | 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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: | 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 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): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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| **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: | 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 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): | |

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| **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: | 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 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): | |

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| **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: | 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: | 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 were 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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: | 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 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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 E. coli levels exceed 235 MPN / 100 ml.<br>*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, 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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 these48 median values, none exceed the objective. E. coli median values range from 10 to 30 MPN / 100 ml.<br><br>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). |
| 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/<br>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: | |

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| 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 |

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| **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): | |

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|---|---|
| **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/ |
| 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): | |

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| **LOE ID:** | **7070** |
| **Pollutant:** | **Total Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |

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| 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<br>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: | 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 |

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| **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 | Physical/Chemical Monitoring |

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| Type: | |
| 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): | |

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| **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/ |

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| 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): | |

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| **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. |

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| 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): | |

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| **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/ |
| 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. |

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| 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): | |

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| **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): | |

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| **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 |

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| **LOE ID:** | **6981** |
| **Pollutant:** | **Fecal Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |

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| 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.<br><br>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/<br>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). |

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| 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 |

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| **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 |

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| **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.<br><br>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.<br><br>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.<br><br>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/<br>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 |

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| | 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 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): | 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 |

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| **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 |

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| | 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/<br>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 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 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: | 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 |

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| **LOE ID:** | **5945** |
| **Pollutant:** | **Escherichia coli (E. Coli)** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |

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| 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: | 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/<br><br>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.<br>*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 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. |

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| | 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): | 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 |

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| **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: | 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/<br>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 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. |

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| 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): | 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 |

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| **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: | 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/<br><br>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 |

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| 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 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): | 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 |

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| **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: | 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. |

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| 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. |
| 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 |

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| **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/<br>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. |

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| | 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 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. |
| 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 |

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| **LOE ID:** | **6079** |
| **Pollutant:** | **Fecal Coliform** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |

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| 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.<br><br>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.<br><br>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.<br><br>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/<br>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 Odd Fellows Bridge near Korbel. The sampling site is accessed via Odd Fellows Park Road |

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| | 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 |

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| **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: | 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 3 sites in Fife Creek, a tributary to the Russian River. The first site is Upper Fife Creek, which is located immediately upstream |

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| | 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 |

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| **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: | 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 fecal coliform levels exceed 400 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. |

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| 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 |

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| **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. |

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| 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 |

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| **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 |

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| **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/<br>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.<br>*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). |

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| 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 |

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| **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). |

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| **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:** | **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 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 are available in the administrative record to assess this pollutant. One of 1 DDT samples exceed the evaluation guideline used to interpret the water quality objective.<br><br>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. 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) One of 1 DDT samples exceeded the evaluation guideline 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 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 not being exceeded. |
| **SWRCB Board Decision / Staff Recommendation:** | |
| **USEPA Decision:** | |

**Lines of Evidence (LOEs) for Decision ID 12910**

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|---|---|
| **LOE ID:** | **25646** |
| **Pollutant:** | **DDT** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Municipal & Domestic Supply |
| Number of Samples: | 1 |

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| Number of Exceedances: | 1 |
| Data and Information Type: | PHYSICAL/CHEMICAL MONITORING |
| Data Used to Assess Water Quality: | One DDT sample collected in the Guerneville HSA had a detectable level of DDT and the sample exceeds the evaluation guideline. The sample concentration was reported as detected not quantifiable (DNQ), with estimated value of .003 ug/l (method detection limit of 0.002 ug/l, reporting limit of .005 ug/l). There were also an additional 18 samples from the Guerneville HSA, which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDT is above the evaluation guideline. Per the listing policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP) (NCRWQCB 2008). |
| Data Reference: | Surface Water Ambient Monitoring Program (SWAMP). DDT, DDE, and DDD data from SWAMP Sampling for Years 2001-2006. North Coast Regional Water Quality Control Board. |
| 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: | Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board |
| 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: | National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology. 4304T |
| 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 runs. |
| Temporal Representation: | Samples were collected over 19 site visits from February 2002 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): | 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) |

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| **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 delist). 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**

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| **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. |

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| 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 |

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|---|---|
| **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: | 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 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): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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|---|---|
| **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: | 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 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 |

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|---|---|
| **LOE ID:** | **8986** |
| **Pollutant:** | **pH** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |
| Beneficial Use: | Cold Freshwater Habitat |

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| 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<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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 |

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|---|---|
| **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 |

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| 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 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): | 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board |

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|---|---|
| **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<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008 |

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| | 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 |

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|---|---|
| **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: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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 |

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| 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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|---|---|
| **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): | |

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|---|---|
| **LOE ID:** | **8992** |
| **Pollutant:** | **pH** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | None |

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| 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<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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: | 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 |

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| **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 |

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| 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: | Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008<br>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 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): | Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007 |

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| **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. Fifteen of the 16 E. Coli samples and 14 of the 16 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) 15 of the 16 E. Coli samples and 14 of the 16 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: | 15 |
| Number of Exceedances: | 13 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | 13 of the 15 total coliform samples from the Laguna de Santa Rosa Watershed exceed the evaluation guideline. Sample concentrations range from 5,600 to >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: | The samples were collected from 5 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; and (5) 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. |
| 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:** | **7075** |
| **Pollutant:** | **Escherichia coli (E. Coli)** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 1 |

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|---|---|
| Number of Exceedances: | 1 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | One of the 1 E. coli samples from the Laguna de Santa Rosa exceeds the evaluation 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 |

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|---|---|
| **LOE ID:** | **6206** |
| **Pollutant:** | **Escherichia coli (E. Coli)** |
| LOE Subgroup: | Pollutant-Water |
| Matrix: | Water |
| Fraction: | Total |
| Beneficial Use: | Water Contact Recreation |
| Number of Samples: | 15 |
| Number of Exceedances: | 14 |
| Data and Information Type: | Physical/Chemical Monitoring |
| Data Used to Assess Water Quality: | 14 of 15 E. coli samples from the Laguna de Santa Rosa Watershed exceed the evaluation guideline. Concentrations range from 100 to 41,000 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 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 5 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; and (5) 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. |
| 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/delisting 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/delisting 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 USEPA during their reconsideration of the 2006 303(d) List microcystin toxin listings for the Klamath River. For more information on USEPA'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 USEPA, Region IX, which was attached to a March 13, 2008 letter from Alexis Strauss, USEPA, 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 USEPA.

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 Water Board already has identified the Klamath River as impaired by temperature and low dissolved oxygen (as well as nutrients). The Regional Water 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 Beaver Creek as sediment impaired, but not Horse, Elk, and Indian Creeks. 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 delist 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 Fuete 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. The information submitted does not meet the requirements of the Listing Policy to support the delisting 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 USEPA 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 USEPA'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 USEPA, Region IX, which was attached to a March 13, 2008

letter from Alexis Strauss, USEPA, 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. However, staff encourage the commentor to submit this report for consideration during the next listing cycle.

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 USEPA 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 USEPA, Region IX, which was attached to a March 13, 2008 letter from Alexis Strauss, USEPA, 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 Water 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 heath 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 USEPA 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 are recommending that the Wooley Creek HSA remain on the 303(d) list for temperature impairment.

In the Public Review Draft of the Integrated Report, staff made the recommendation to delist the Wooley Creek HSA for temperature based on the determination that there was <15% human disturbance in the watershed, and thus, the high stream temperatures reported for the HSA

were “natural”. Additional Lines of Evidence presented as supporting evidence were road density, modeled landslide volumes, and modeled surface erosion volumes, all of which did not exceed their respective evaluation guidelines.

Based upon public comments and input by State Water Board staff, Regional Water Board staff reassessed the available information and determined that the original approach utilized in the Decision to propose delisting the Wooley Creek HSA needed to be re-evaluated.

First, the use of a disturbance index of <15% is an inappropriate tool for determining natural water temperature conditions in the watershed. Rather, evaluation of compliance with the Salmon River Watershed Temperature TMDL targets for effective shade should be completed in order to determine whether the temperature objective is being met, and therefore whether delisting is warranted. To evaluate whether the TMDL target is being met, monitoring of riparian shade conditions and instream temperatures both need to be conducted. Since the TMDL is based on effective shade conditions, these conditions need to be monitored. When these TMDL shade targets are met, then the water temperatures can be said to represent natural temperature conditions.

Given that the TMDL targets need to be met to assure natural stream temperature, and that current stream temperature data reflect impaired conditions, Regional Water Board staff have determined that Wooley Creek should remain on the 303(d) List.

Second, the Line of Evidence (LOE 21155) on human disturbance in the Wooley Creek watershed was not incorporated as supporting evidence into the Decision on Wooley Creek, as public comments submitted on the Public Review Draft of the Integrated Report included new information revealing that there may be more human-related disturbance in the watershed than was previously identified. The new information submitted during the public comment period will be considered and the LOE will be updated for use in the next listing cycle.

Third, road density data is currently being utilized only as a supporting line of evidence in this Decision. Road density information is not an appropriate form of data to use as the primary basis for water temperature listing and delisting decisions.

Finally, modeling data from the USFS pertaining to landslide volumes and surface erosion values are no longer being incorporated in the water temperature Decision for the Wooley Creek HAS, as public comments submitted on the Public Review Draft of the Integrated Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing

Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.

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 Water 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 he data if 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 USEPA 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 USEPA 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 not be delisted. Staff have determined that the other five waterbodies remain temperature impaired as well and should not be delisted. 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 delist 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 delist per Section 4.2 of the Listing Policy.

# Appendix C: Response to Comments Submitted During Public Comment Period

The North Coast Regional Water Quality Control Board (Regional Water Board) released the 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 (Integrated Report) on February 2, 2009. Regional Water Board staff have solicited written comments on the Integrated Report. The written public comment period ended March 20, 2009.

All written comments received by March 20, 2009, are summarized in this appendix. Comments are summarized and not duplicated verbatim. Regional Water Board staff have provided written responses to all public comments received in writing by the end of the March 20th comment period.

The comments are grouped into categories. Within these categories, comments made by more than one individual are listed first. The remaining comments are organized alphabetically by the commenter's surname.

## LAKE SHASTINA MERCURY COMMENTS

1. Comment(s)
   - Support the proposed listing of Lake Shastina for impairment from mercury.

   Comment(s) Made By:
   Crystal Bowman – Quartz Valley Indian Reservation
   Petey Brucker – Klamath Forest Alliance
   Will Harling – Mid Klamath Watershed Council
   Leaf Hillman – Karuk Tribe
   Tom Lyons – California Coastkeeper Alliance
   Erica Terence – Klamath Riverkeeper

   Response:
   Comment noted.

2. Comment(s)
   - The recommendation to list Lake Shastina for mercury should not be based on data that were collected on a single day.

   Comment(s) Made By:
   Ric Costales – County of Siskiyou
   Tom Wetter – Lake Shastina, CA

   Response:
   The data were collected on 3 separate days during July 2001. Mercury in fish tissue is caused by exposure and bioaccumulation. Mercury concentrations in fish tissue do not change on a daily basis. Mercury in fish tissue represents integrated mercury exposure over time; therefore, utilizing a few sampling events to assess conditions is representative of actual fish tissue concentrations year-round.

3. Comment(s)
   - The recommendation to list Lake Shastina for mercury should not be based on data that is over 9 years old.

   Comment(s) Made By:
   Ric Costales – County of Siskiyou
   Tom Wetter – Lake Shastina, CA

   Response:
   In the development of the Listing Policy, an alternative was examined that would establish guidance on the age of data acceptable for listing (SWRCB, 2004 – Functional Equivalent Document). This alternative was not selected for inclusion in the Policy since “the use of all data and information, regardless of age,

ensures that all readily available data and information is used." The Functional Equivalent Document states "If older data are all that is available it should be used to decide if the water should be listed or delisted." Mercury is not a transient constituent and is not likely to attenuate over time. The presence of mercury in fish tissue indicates that sources are still likely exist at impairment levels.

In addition, the State Water Board's Surface Water Ambient Monitoring Program (SWAMP) collected fish tissue data in Lake Shastina in 2007; final quality assurance review of this data has not been completed. Preliminary assessment of these data suggest that fish tissue concentrations of mercury exceed the evaluation guideline, these data will be considered for use in the next listing cycle.

4. Comment(s)
   - The recommendation to list Lake Shastina for mercury should not be based on tissue samples that were sent to different laboratories that used 3 different analytical methods.

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District
   Tom Wetter – Lake Shastina, CA

   Response:
   Even though the DWR (2007) report does use fish tissue data that was analyzed by different laboratories, all samples collected from Lake Shastina were sent to the same laboratory (West Coast Analytical Services) and analyzed by the same method. According to the author, the reason three different labs were used during the study was due to logistics and contracting issues, and not quality control (CA Department of Water Resources, personal communication with Scott McReynolds, 4/14/2009)

5. Comment(s)
   - The risk assessment approach used as a basis for the evaluation guideline is based on questionable assumptions.
   - Fish consumption advisories are a better management approach to address the public health concern than establishing a TMDL.

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District
   Tom Wetter – Lake Shastina, CA

   Response:
   The California Office of Environmental Health Hazard Assessment (OEHHA) criteria for issuing fish tissue consumption advisories have recently been updated

(Klasing and Brodberg, 2008). These criteria describe various advisory levels for different ranges of contaminants, including a "Fish Contaminant Goal (FCG)" for use by other agencies. However, using the FCG for an evaluation guideline for listing would be based on different risk assessment assumptions than were used for developing the USEPA Criteria. The USEPA Criteria were used as the evaluation guideline to support the current proposed listing. USEPA considers the methyl-mercury criterion for fish tissue protective of all populations (IRIS, 2001). The available fish tissue data for Lake Shastina has been provided to OEHHA for their consideration.

The purpose for developing a TMDL for an impaired waterbody is to identify and quantify the sources contributing to a water quality impairment, and establish a restoration plan to control these sources. Part of the strategy to address mercury impairment of Lake Shastina should involve educating the public about potential health risks associated with consuming fish caught in Lake Shastina.

6. Comment(s)
   - The recommendation to list Lake Shastina for mercury should not be based on data that do not represent spatial or temporal independence.

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District

   Response:
   Mercury in fish tissue is caused by exposure and bioaccumulation. Sampling of fish tissue represents integrated mercury exposure over time. Spatial and temporal independence would be needed for statistical tests, but is not needed for evaluation of impairment. Fish populations can be transient and not sessile. Temporal independence is needed to avoid serial autocorrelation in conducting trend tests, but not for evaluation of impairment. Mercury concentrations in fish tissue do not change on a daily basis. Because sampling of fish tissue represents integrated mercury exposure over time, and because fish are not stationary in the waterbody over time a single day sampling event is considered representative of conditions.

7. Comment(s)
   - The Basin Plan does not list Lake Shastina for Commercial and Sport Fishing (COMM). To utilize a methodology for assessment based on consumption of fish should not be condoned when that beneficial use is not recognized by the Basin Plan.

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District

   Response:

Although the Basin Plan does not specifically designate COMM as a beneficial use, evidence was presented in LOE 21168 demonstrating that sport fishing does exist in the Lake and this use should be protected. The Regional Water Board will revise the Basin Plan to include the COMM beneficial use for Lake Shastina.

8. Comment(s)
   - It is unclear why the Regional Water Board chose to perform dioxin testing in 2008 and not mercury sampling, when Lake Shastina is proposed for listing for mercury on the 2008 303(d) List. Collection of additional mercury data following an adequate QAPP is encouraged.

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District

   Response:
   The Regional Water Board commonly uses data collected by the Statewide SWAMP program to assess support of beneficial uses. The SWAMP Program collected additional fish tissue data in Lake Shastina in 2007; final quality assurance review of this data has not been completed. Preliminary assessment of these data suggest that fish tissue concentrations of mercury exceed the evaluation guideline, and the data will be considered for use in the next listing cycle. The SWAMP program has a robust Quality Assurance Management Plan (Puckett 2002) that has been reviewed and approved by all nine Regional Water Board QA officers and the State Water Board.

9. Comment(s)
   - Information referenced does not show consistency with the elements specified in the Listing Policy for a Quality Assurance Project Plan (QAPP).

   Comment(s) Made By:
   Mike Crebbin – Montague Water Conservation District

   Response:
   In addition to the QAPP information contained in the DWR (2007) report, additional information was submitted which contains an explanation of the protocols utilized for sample collection, handling, and storage among other things (CDWR 2000a; CDWR 2000b). Regional Board review of all of these quality assurance documents. Indicates that the DWR quality assurance program meets the minimum elements described in the Listing Policy.

10. Comment(s)
   - There aren't any peer reviewed or accepted protocols for measuring or monitoring water chemistry for methyl mercury. Therefore, TMDL monitoring

and mitigation scenarios for Lake Shastina can't be envisioned at this time, and listing Lake Shastina is a bookkeeping exercise.

Comment(s) Made By:
Tom Wetter – Lake Shastina, CA

Response:
There is a USEPA approved Method 7473, "Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry", for analyzing Methyl-mercury in water.

## MARK WEST CREEK COMMENTS

11. Comment(s)
    - The proposed TMDL for Mark West Creek is scheduled to address temperature and sediment impairment by 2019. With the accelerating rate of vineyard conversion in the Mark West Creek Watershed, delaying the TMDL until 2019 will result in even more severe sediment and temperature impairment in this critical cold freshwater habitat. Salmonid fish are not likely to survive a 10-year schedule for completion of the TMDL. The TMDLs should be started immediately and completed in at least the next five years.

Comment(s) Made By:
Harriet Buckwalter – The Friends of the Mark West Watershed
Jim Doerksen – Santa Rosa, CA
Terrance Fleming et al. – Community Clean Water Institute
Alan and Sharon Grinnell – Santa Rosa, CA
Stephen B. Krimel – Save Mark West Creek
Tom Lyons – California Coastkeeper Alliance
Paul Marking – Santa Rosa, CA
Don McEnhill – Russian Riverkeeper
Griffin W. Okie – Santa Rosa, CA
Paul Sundquist – Santa Rosa, CA

Response:
The Mark West Creek watershed was listed as part of the entire Russian River watershed in 1998 for sediment and in 2002 for temperature. The 2019 schedule date for TMDL completion shown in the proposed integrated report applies to the Russian River watershed sediment and temperature TMDLs. However, sediment and temperature TMDLs for Mark West Creek are currently being developed as part of the larger Laguna de Santa Rosa watershed TMDLs. The Laguna de Santa Rosa TMDLs will address low dissolved oxygen, high nutrients, high temperature and sedimentation impairments. These TMDLs are planned for presentation to the Regional Water Board by November 2011, with USEPA approval expected in 2012.

12. Comment(s)
    - Visual observations made by Mark West Creek watershed residents witnessed mortality in salmonid populations. This impairment is assumed to be caused by high temperatures exasperated by vineyard water withdrawals and land surface erosion.

    Comment(s) Made By:
    Terrance Fleming et al. – Community Clean Water Institute

    Response:
    Visual observation data are allowed under the Listing Policy only as an ancillary LOE. If these visual observations can be documented and submitted to the Regional Water Board, they may be included as an ancillary LOE for the next listing cycle.

**MAD RIVER DDE COMMENTS**

13. Comment(s)
    - Supports the listing of the Mad River for DDE.

    Comment(s) Made By:
    Tom Lyons – California Coastkeeper Alliance
    Jennifer Savage, et al. – Surfrider Foundation Humboldt Chapter
    Michelle D. Smith – Attorney for the Humboldt Baykeeper

    Response:
    Based on Regional Water Board staff's reevaluation of the available data, in light of the Listing Policy, staff are no longer recommend listing the Mad River on the 303(d) List for DDE impairment.

    One DDE sample collected in the mainstem Mad River was detected at a level of .004 ug/l, and the other sample concentration was detected not quantifiable (DNQ), with estimated value of .001 ug/l (method detection limit of 0.001 ug/l, reporting limit of .002 ug/l). Both sample concentrations exceed the evaluation guideline.

    There were also an additional 10 samples from the mainstem Mad River, all of which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDE is above the evaluation guideline. Per the Listing Policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis.

    The one detection of DDE occurred in 2002 and the one DNQ of DDE occurred in 2003. All 9 subsequent DDE samples taken in the mainstem Mad River from

April 2003 to June 2006 have been non-detect. Additionally, there have been 2 samples collected since June 2006, both of which were non-detect.

Based on the readily available data and information, Regional Water Board staff have determined that there is sufficient justification to not place this water segment-pollutant combination on the section 303(d) List in the Water Quality Limited Segments category at this time. The lack of any DDE "detections" in any watershed in the North Coast Region since 2003 has raised questions about the validity of the data from 2002 and 2003. Thus, Regional Water Board staff do not propose utilizing this information as the sole basis for listing. Additional sampling for DDE in the Mad River will be conducted as part of SWAMP. When additional DDE data becomes available, it will be assessed in future listing cycles, and the determination not to list the Mad River for DDE will be re-evaluated.

14. Comment(s)
- Requests a higher priority for development of the Mad River DDE TMDL since the river is the primary drinking water source for seven municipalities.

Comment(s) Made By:
Michelle D. Smith – Attorney for the Humboldt Baykeeper

Response:
See response to Comment #13.

**RUSSIAN RIVER DDT COMMENTS**

15. Comment(s)
- Supports the proposed listings of the Russian River HA, Guerneville HSA for DDT.

Comment(s) Made By:
Allison Gordon – Pacific Coast Federation of Fishermen's Association
Tom Lyons – California Coastkeeper Alliance
Don McEnhill – Russian Riverkeeper

Response:
The proposed Russian River HA, Guerneville HSA DDT listing has changed since the Public Review Draft of the Integrated Report was issued. Regional Water Board staff are no longer recommending that the Russian River HA, Guerneville HSA be listed for DDT as discussed below.

Originally, Regional Water Board staff made the recommendation to list the Russian River HA, Guerneville HSA for DDT based on a review of the SWAMP data. These data indicated that there were 2 of 2 DDT samples in the Guerneville HSA which exceeded the evaluation guideline and thus, it was recommended for listing as DDT impaired.

Upon further review of the SWAMP data, it was determined that only one of the 2 detections of DDT was in the Guerneville HSA. This brought the number of detections to 1 of 1, and according to Table 3.1 this does not exceed the minimum number of exceedances needed to place a water segment on the 303(d) List for toxicants. Therefore, it is not recommended that the Guerneville HSA be listed for DDT.

**SCOTT RIVER WATERSHED COMMENTS**

16. Comment(s)
    - Recommend the future listing of the Scott River mainstem for nutrients (TP and TN), dissolved oxygen, pH, and specific conductance based on data collected by the QVIR Environmental Program in 2007 and 2008.

    Comment(s) Made By:
    Crystal Bowman – Quartz Valley Indian Reservation
    Petey Brucker – Klamath Forest Alliance
    Felice Pace – Klamath, CA
    Erica Terence – Klamath Riverkeeper

    Response:
    For the current listing cycle, the public data solicitation period ended February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the next listing cycle. Additionally, staff recommend that any additional data to support these listing recommendations be submitted during the next data solicitation period.

17. Comment(s)
    - Recommend the future listing of Scott River mainstem, Shackleford Creek and Sniktaw Creek for E. coli. Supporting data for recommended E. Coli listing is presented.

    Comment(s) Made By:
    Crystal Bowman – Quartz Valley Indian Reservation
    Petey Brucker – Klamath Forest Alliance
    Erica Terence – Klamath Riverkeeper

    Response:
    For the current listing cycle, the public data solicitation period ended February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the next listing cycle. Additionally, staff recommend that any additional data to support these listing recommendations be submitted during the next data solicitation period.

18. Comment(s)
- Requests the Scott River be listed for nutrients. Photos were submitted that show the nutrient pollution that includes manure laden water being discharged, cow pies in the stream bed, livestock access to the Scott River.

Comment(s) Made By:
Felice Pace – Klamath, CA

Response:
Visual observation data are allowed under the Listing Policy only as an ancillary LOE. For the current listing cycle, the public data solicitation period ended February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the next listing cycle.

19. Comment(s)
- Surface Water Ambient Monitoring Program (SWAMP) data on pesticides from 3 of 4 monitoring locations on the Scott River were utilized in the Integrated Report analysis. The omitted location (Scott River at Fort Jones, 105SCOTFJ) is the location with the greatest likelihood if showing pesticides in the water due to its location immediately downstream of where pesticides are utilized.
- SWAMP long term monitoring site is at Callahan above most of the agricultural uses. Please consider changing the long term monitoring site.
- Over 50% of the SWAMP samples taken in the Scott River were taken just above the mouth of the river. The dominance of these samples from the bottom (Scott Valley) does not give a clear picture of conditions in the river. Sampling near Fort Jones in needed.

Comment(s) Made By:
Felice Pace – Klamath, CA

Response:
The SWAMP program is designed to assess all the State's waters. The program has limited funding and has suffered funding cuts every year since its inception. Since 2005, the majority the North Coast Regional Water Board's allotment has been spent on maintaining long-term trend monitoring sites.

Regional Water Board staff have focused on water column chemistry sampling to determine Beneficial Use attainment. Staff developed trend-monitoring locations at the mouths of major tributaries and at major confluences in larger river systems. A second component of the SWAMP effort is the intensive rotating basin sampling. This allows for a more thorough investigation into the dynamics that may be present in each system.

In the Scott River watershed, the long-term trend monitoring site is near the mouth of the Scott River (105SCOTSH). The Callahan site is not a long-term

monitoring site. There were two rotating sampling locations in the Scott River watershed for 2002-2003: Scott River at Callahan (105SCOTCA) and Scott River at Jones Beach (105SCOTJB). When Regional Water Board staff began rotating basin sampling, the location on the river near Fort Jones (105SCOTFJ) was sampled, but after three sampling events the location was moved to Jones Beach because sampling crews did not feel safe sampling off Highway 3 and felt it was too great a life risk hazard. Jones Beach was the most upstream site between the mouth and Fort Jones that was accessible to staff.

Regional Water Board staff began collecting pesticide samples after this change in monitoring locations. Staff did collect pesticide samples in October 2002, and February, April, and June 2003 at all sites.

It is the intent of Regional Water Board staff to bracket the Fort Jones wastewater treatment plant for water quality monitoring this summer.

20. Comment(s)

- The Regional Water Board staff did not evaluate nitrogen and phosphorus data collected by the SWAMP program and only evaluated ammonia data. Nitrogen and phosphorus data should be evaluated against the USEPA's criteria from the document titled: "Ambient Water Quality Criteria Recommendations. Information Supporting the Development of State and Tribal Nutrient Criteria. Rivers and Streams in Nutrient Ecoregion II" (USEPA 2000), and the Scott River should be listed for nutrient pollution based on the SWAMP data.

Comment(s) Made By:
Felice Pace – Klamath, CA

Response:
Phosphorus and total nitrogen data were not included in the Fact Sheets for the Integrated Report because the data are from grab samples and are not directly comparable to the Basin Plan's narrative biostimulatory substances water quality objective. Nutrients alone do not impair beneficial uses or cause non-attainment of objectives (with the exception of ammonia and nitrate). Rather, nutrients cause indirect impacts through aquatic plant growth (photosynthesis and respiration), which can result in extreme diel patterns for dissolved oxygen and pH, which can impair uses. Waterbody-specific factors such as riparian cover, flow conditions, and stream channel configuration also affect how nutrients are processed within the stream, and play a large role in determining whether or not nuisance aquatic plant conditions will prevail. For these reasons, staff are not able to compare a single nutrient concentration to the existing biostimulatory substances narrative water quality objective. Instead, nutrient-related indicator parameters (such as diel measurements of dissolved oxygen, pH, chlorophyll-a, and aquatic plant biomass) are needed in order to determine attainment of objectives and protection of beneficial uses.

This approach is consistent with the State Board's Staff Report on Nutrient Screening Tools for Use in the 303(d) Process (SWRCB 2007) and is based on the "Technical Approach to Develop Nutrient Numeric Endpoints for California" (California NNE) (Tetra Tech 2006).

For the purposes of the Integrated Report, Regional Water Board staff decided not to use the USEPA's criteria (USEPA 2000) as evaluation guidelines, or the criteria are based on the 25th percentile of sampled streams only.

**KLAMATH RIVER MICROCYSTIN COMMENTS**

21. Comment(s)
- Supports the proposal to list reaches of the Klamath River for microcystin.

Comment(s) Made By:
Crystal Bowman - Quartz Valley Indian Reservation
Petey Brucker – Klamath Forest Alliance
Allison Gordon - Pacific Coast Federation of Fishermen's Association
Will Harling - Mid Klamath Watershed Council
Leaf Hillman - Karuk Tribe
Tom Lyons - California Coastkeeper Alliance
Tera Palmer - Salmon River Outpost
Michelle D. Smith - Attorney for the Humboldt Baykeeper
Erica Terence - Klamath Riverkeeper

Response:
Comment noted.

Please note the proposed microcystin (Cyanobacteria hepatotoxic microcystins) listings for Copco Lake, Iron Gate Reservoir, and reaches of the mainstem river in the Klamath River HU have not changed since the Public Review Draft was issued. However, the information utilized in the Decisions for these listings has been altered somewhat, as discussed below.

Review of these Decisions by State Water Board staff raised questions about the evaluation guidelines utilized for microcystin toxin in fish tissue and microcystin toxin in the water column.

The original evaluation guideline for microcystin toxin in the water column was from a document that is still considered draft, titled "Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft" (State Water Board 2008). This document is authored by the Blue Green Algae Work Group which is comprised of staff from the State Water Board, Regional Water Board, Department of Public Health, and Office of Environmental Health Hazard Assessment (OEHHA). According to the Listing Policy, information from "draft" documents cannot be utilized as evaluation guidelines. Therefore, a new

evaluation guideline for microcystin toxin in the water column from the World Health Organization (2003), that meets the requirements of the Listing Policy, was utilized. The use of this new evaluation guideline did ***not*** change the outcome of any of the Decisions, nor did it change any listing determinations.

The original evaluation guideline for microcystin toxin in fish tissue was from a letter to PacifiCorp from the Deputy Director for Scientific Affairs at OEHHA in which an advisory tissue level was calculated utilizing a methodology from the published literature. According to State Water Board staff , this document does not meet the requirements of the Listing Policy because it was not an official approved and published agency document.

Regional Water Board staff were unable to find an evaluation guideline for microcystin toxin in fish tissue from an official approved and published agency document, and therefore these data were not able to be utilized in the assessment of microcystin impairment. However, these data are presented in the Decisions for informational purposes. The removal of this information from the Decisions for microcystin did ***not*** change the outcome of any of the Decisions, nor did it change any listing determinations.

22. Comment(s)

- The Klamath River should be listed not only for microcystin, but also for the toxigenic cyanobacteria Microcystis aeruginosa that produces microcystin.

Comment(s) Made By:
Crystal Bowman - Quartz Valley Indian Reservation
Will Harling - Mid Klamath Watershed Council
Leaf Hillman - Karuk Tribe
Erica Terence - Klamath Riverkeeper

Response:
The USEPA's 2002 Integrated Reporting Guidance makes the distinction between "pollutants" and "pollution" by identifying the 303(d) List as a record of water segments impaired by pollutants. "Pollutants" are specifically defined in Clean Water Act Section 502. Pollutants can readily be quantified into a load for establishing a TMDL. On the other hand, "Pollution" is defined as "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water." In this case, the pollutant is the microcystin and the presence of *Microcystis aeruginosa* defined as "pollution". Therefore, the listing should be based on the pollutant microcystin.

23. Comment(s)

- Questions whether the Regional Water Board has a baseline of pre- and post-dam natural conditions for microcystin in the Klamath River.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
In developing the Integrated Report, staff considered data submitted on microcystin in the Klamath River and compared conditions against our water quality objectives and evaluation guidelines to determine impairment. A specific finding that post-dam conditions are changed from pre-dam conditions is not required to determining impairment.

24. Comment(s)
- Questions why the Regional Water Board specifically excluded the Klamath River from the Oregon Border to Copco I Reservoir from being listed for microcystin impairment.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
On May 29, 2008, the USEPA placed Copco I and Copco II Reservoirs, Iron Gate Reservoir, and the waters in between these reservoirs on the 303(d) List for microcystin impairment. The area from the Oregon Border to Copco I reservoir was not proposed for listing as data did not show impairment within this reach of the river. Data submitted for the Oregon to Copco I reach of the mainstem Klamath River during the 2008 303(d) List call for data period does not reflect microcystin impairment (LOE 25978). Thus, Regional Water Board staff are not proposing this reach of the river be listed for microcystin impairment.

25. Comment(s)
- Concern was raised that if dam removal occurs on the Klamath River the Regional Water Board intends to extend TMDL impairment of the Klamath River for microcystin up to the Oregon border.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
Regardless of whether dams are removed or not, any new data submitted to the Regional Water Board for the next listing cycle and beyond will be analyzed to determine impairment.

26. Comment(s)

- The listing of the Klamath River from Iron Gate to the Trinity River as impaired by microcystin toxin will do little to address the problem of microcystin in the river beyond ongoing efforts. The Regional Water Board should allow these other processes to proceed as a means to address the problem. Listing for microtoxin only diverts attention from the principal cause of the problem of nutrient loading from upstream sources. Comment included a letter sent to USEPA on April 28, 2008 which gives further details and discussion on these points.

Comment(s) Made By:
Robert E. Donlan – Attorney for PacifiCorp

Response:
USEPA reconsidered its prior approval of the omission of microcystin toxin listings for three Klamath River segments. On March 13, 2008, USEPA determined to add to California's 2006 Section 303(d) List a listing for microcystin toxin for the segments, "Klamath River HU, Middle HA, Oregon to Iron Gate".

The Regional Water Board is currently developing TMDLs to address water quality impairments for nutrients, low dissolved oxygen/organic enrichment, and temperature. These TMDLs address California waters from Oregon to the mouth of the Klamath River at the Pacific Ocean. If approved as currently drafted, these TMDLs would address the microcystin impairment once the TMDLs are fully incorporated. The Regional Water Board is scheduled to complete these TMDLs in 2009, then send them to State Board and OAL for their action. USEPA must approve California's submitted Klamath River TMDLs or establish the TMDLs themselves by December 31, 2010. This is consistent with a consent decree entered into by USEPA in 1997 and revised in December 2008 (*Pacific Coast Fisherman's Associations; et al. v. EPA*).

27. Comment(s)

- Disagrees with the assertion that J.C. Boyle, Copco 1, Copco 2, and Iron Gate Dams are the causative factor of algae (Microcystis) in the Klamath River.

Comment(s) Made By:
Dr. Richard A. Gierak – Yreka, CA

Response:
The available water quality data show that suspended algae and algal toxin concentrations are higher within Copco I and II and Iron Gate Reservoirs than they are in the riverine reaches of the river in California including the reach above Copco Reservoir.

28. Comment(s)
    - Proposes new sampling protocols to determine the causative factor of algae in the Klamath River. The current water sampling for Microcystis is occurring in backwater eddies and pools in Copco and Iron Gate reservoirs where algae will propagate in summer heat and does not feel these samples are representative. An "Oversight Group" should be established to address sampling issues.

    Comment(s) Made By:
    Dr. Richard A. Gierak – Yreka, CA

    Response:
    The Regional Water Board staff, working in conjunction with PacifiCorp, Tribes, and Bureau of Reclamation among others, developed a coordinated monitoring plan for 2009-2010 for the Klamath Basin. This is part of the ongoing activities of the Klamath Basin Water Quality Monitoring Coordinating Group (KBWQMCG).

    Monitoring programs have many different objectives, and these objectives may translate into different sampling protocols. For example, for public health risk monitoring it is important to sample locations that are likely places of human exposure including where conditions are likely to pose health risks. Existing guidelines for monitoring and health advisory posting that are currently used by the Regional Water Board regarding blue-green algae requires sampling near shore surface scums. To understand ecosystem dynamics more broadly requires depth integrated sampling that captures total water column conditions. It is important to note that both methods are in use by all reach monitoring entities taking part in implementing the 2009-2010 coordinated monitoring plan. It is also important to note that independent monitoring teams from these entities have reported similar conditions.

**WOOLEY CREEK TEMPERATURE COMMENTS**

29. Comment(s)
    - Opposes the proposed delisting of Wooley Creek as impaired for temperature. Members of the Salmon River Restoration Council (SRRC) commonly observe dangerously high water temperatures in Wooley Creek. The SRRC often saw temperatures in Wooley Creek exceed 72 degrees in 2008.

    Comment(s) Made By:
    Lyra Cressey - Salmon River Restoration Council
    Allison Gordon - Pacific Coast Federation of Fishermen's Association
    Will Harling - Mid Klamath Watershed Council
    Tom Lyons - California Coastkeeper Alliance
    Erica Terence - Klamath Riverkeeper

Response:
Water temperature data and land use information evaluated for the 2008 Integrated Report reflect conditions that continue to be impaired by temperature. Additionally, it can not be determined, at this time, whether temperatures in Wooley Creek are natural, because it is unknown whether TMDL targets for effective shade established in the Salmon River Watershed Temperature TMDL have been met.

Wooley Creek was included in the Salmon River Watershed TMDL for high water temperature. The USEPA approved the TMDL on March 26, 2006. The TMDL loading capacity is equal to adjusted potential effective shade conditions and the associated solar loading that result in natural receiving water temperatures. The TMDL was set equal to 69.7% as the mean adjusted potential effective shade value.

To evaluate whether the TMDL target is being met, monitoring of improved riparian shade, reduction in solar radiation inputs, and instream temperatures all need to be conducted. Since the TMDL is based on effective shade conditions, these conditions need to be monitored. When available data demonstrates that these TMDL shade targets are met, then the water temperatures can be said to represent natural receiving water temperatures, the narrative Basin Plan objective for temperature.

Given that the TMDL targets need to be met to assure natural stream temperature, and that current stream temperature data reflect impaired conditions, Regional Water Board staff have determined that Wooley Creek should remain on the 303(d) List. See also responses to comments #31 and #32.

30. Comment(s)

- Oppose the Regional Water Board decision to separate Wooley Creek from the Salmon River hydrologic unit used for listing. Request the Regional Water Board reconsider and reverse the decision to isolate Wooley Creek as an independent hydrologic unit, since the salmonid habitat in the Salmon River Watershed should be managed and restored as a whole basin, not as separate pieces. Wooley Creek will still be managed under the Salmon River TMDL and Implementation Plan.

Comment(s) Made By:
Petey Brucker - Klamath Forest Alliance
Lyra Cressey - Salmon River Restoration Council
Will Harling - Mid Klamath Watershed Council
Erica Terence - Klamath Riverkeeper

Response:
Data from Wooley Creek was evaluated as a separate hydrologic unit in the Integrated Report in order to assess the impairment status of this HSA. These separate lines of evidence will still be tracked separately in the Integrated Report database, even though staff do not recommend delisting at this time. Evaluation of TMDL effectiveness will occur for the full extent of the TMDL (i.e., the entire Salmon River Watershed) as effective shade data become available.

31. Comment(s)
- The Regional Water Board should review and revise the decision that the water temperatures measured in Wooley Creek are natural and not altered by human activities. The Regional Water Board states that less than 15% of the watershed is affected by human activities (Line of Evidence 21155). However, 11% of the watershed is held in cattle grazing allotments on USFS land.

Comment(s) Made By:
Crystal Bowman - Quartz Valley Indian Reservation
Petey Brucker - Klamath Forest Alliance
Will Harling - Mid Klamath Watershed Council
Leaf Hillman - Karuk Tribe

Response:
The Line of Evidence (LOE 21155) on human disturbance in the Wooley Creek watershed was not incorporated into the Decision on Wooley Creek as public comments submitted on the Integrated Report included new information that there may be more disturbance in the watershed than was previously indicated. The new information submitted during the public comment period will be considered in the next listing cycle, and the LOE will be updated for use in the next listing cycle.

Additionally, it can not be determined, at this time, whether temperatures in Wooley Creek are natural, because it is unknown whether TMDL targets for effective shade have been met. (See response for comment # 29).

Given that the TMDL targets need to be met to assure natural stream temperatures, Regional Water Board staff have determined that Wooley Creek should remain on the 303(d) List.

32. Comment(s)
- The Regional Water Board should review and revise the decision that the water temperatures measured in Wooley Creek are natural and not altered by human activities.

- Water temperature data collected since the 2008 fires that severely burned big parts of the Wooley Creek watershed are outside the data set analyzed by the water board in its 2008 Integrated Report.
- Sediment modeling results are based on data collected following the 2006 wildfires. The Regional Water Board specifically states that these data were not affected by these fire events.

Comment(s) Made By:
Crystal Bowman - Quartz Valley Indian Reservation
Will Harling - Mid Klamath Watershed Council
Leaf Hillman - Karuk Tribe

Response:
It can not be determined, at this time, whether temperatures in Wooley Creek are natural, because it is unknown weather TMDL targets for effective shade have been met. (See response for comment # 29). Given that the TMDL targets need to be met to assure natural stream temperature, and that current stream temperature data reflect impaired conditions, Regional Water Board staff have determined that Wooley Creek should remain on the 303(d) List.

For the current listing cycle, the public data solicitation period ended February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the next listing cycle. Staff recommend that water temperature data collected in the Wooley Creek watershed following the 2008 fires be submitted during the next data solicitation period.

Modeling data from the USFS (LOE 21156) pertaining to landslide volumes and surface erosion values are no longer being incorporated in this Decision 9540 as comments submitted on the Public Review Draft of the Integrated Report pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.

33. Comment(s)
- The Regional Water Board should not use modeling data for Wooley Creek as primary Lines of Evidence for temperature listing decisions. The proposed Integrated Report identifies Lines of Evidence based on modeling of accelerated mass wasting and erosion (LOE 21156) and road density (LOE 21154).

Comment(s) Made By:
Petey Brucker - Klamath Forest Alliance
Will Harling - Mid Klamath Watershed Council

Response:
See response #32. Thus, the Regional Water Board only utilizes modeling data for supporting Lines of Evidence, and not as the basis for a listing or delisting determination.

Road density data was used as a supporting line of evidence in this listing Decision 9540. However, water temperature data was utilized as the primary evidence for this listing decision.

**KLAMATH RIVER SEDIMENT COMMENTS**

34. Comment(s)
- Supports the proposed listing of Klamath River reaches and the tributary watersheds for sediment impairment.

Comment(s) Made By:
Petey Brucker - Klamath Forest Alliance
Allison Gordon - Pacific Coast Federation of Fishermen's Association
Will Harling - Mid Klamath Watershed Council
Leaf Hillman - Karuk Tribe
Tom Lyons - California Coastkeeper Alliance
Erica Terence - Klamath Riverkeeper

Response:
The proposed listings have changed since the Public Review Draft of the Integrated Report was issued. Appendix D contains a complete discussion of the changes and the reasoning behind them. Additionally, a description of the approach used to evaluate sediment impairment in the Klamath River HU is presented below. This approach is supported by the Listing Policy and Functionally Equivalent Document to the Listing Policy.

Instream sediment data (i.e. percent fines and embeddedness) was used as the primary evidence/basis for sediment impairment assessments. Upslope information (road density information), visual estimates of pool filling, and cumulative impacts data from USFS reports were used only as supporting evidence, not as the primary evidence for assessing waterbodies. Modeling data is no longer being utilized as supporting evidence in this listing Decision, as public comments submitted on the Integrated Report pointed out that the modeling results utilized in the assessment of Klamath River sediment impairment were out-of-date and that newer results were available. The newer modeling information (USFS 2004) was submitted by the USFS during the public comment period. Due to the fact that these data were submitted after the solicitation period for new data for the 2008 Integrated Report (submittal period closed February 28, 2007), they will be considered, and become part of the record, for the next listing cycle. However, due to the fact that the 2004 modeling results reflect different conditions than the original modeling data utilized in the Integrated Report it was determined that the original modeling data were no

longer current and would not be utilized in the 2008 Integrated Report. Thus, only in waterbodies where instream sediment data are available and those data exceed the evaluation guideline has Regional Water Board staff recommended listing.

35. Comment(s)

- The Fact Sheet for (Decision ID 13197) describes no Lines of Evidence for listing sediment on the mainstem Klamath River. There is no basis given for the listing.
- The sediment listing proposal for the Beaver Creek Watershed is based on anecdotal observational data by Forest Service personnel in 1997 (LOE 25700). More current information should be used to support listing.
- The sediment listing proposal for the Beaver Creek Watershed is based on a 1996 NOAA Fisheries standard of road density and valley bottom roads. This standard is not valid and more contemporary standards should be used for listing decisions.
- Visual inspection of tributaries to the Klamath River in the Middle and Lower HAs from Iron Gate Dam to the Trinity River will show that very little, if any, residual sediment exists within the flowing channel.
- Information and research gathered by the Klamath National Forest more recently than the Thompson/Seiad/Grider Ecosystem Analysis (USFS 1999) should be utilized for the Klamath River tributary watershed sediment listings. The 1999 report reflects conditions after a major flood event in January 1997.
- Many of the tributary watersheds to the Klamath River proposed for listing as impaired by sediment are not assessed in the Thompson/Seiad/Grider Ecosystem Analysis (USFS 1999). Regional Water Board staff merely presumes that the data and conclusions in this report can be applied to these watersheds.
- The use of modeling and questionable protocols such as Equivalent Roaded Area are not appropriate for determining sediment impairment, when the only impairment is to COLD.

Comment(s) Made By:
Glen O. Briggs - Seiad Valley, CA
Ric Costales - County of Siskiyou
Chris Quirmbach - Timber Products Company

Response:
The proposed listings have changed since the Public Review Draft of the Integrated Report was issued. Additionally, the approach used to evaluate sediment impairment in the Klamath River HU has changed. See Appendix D for a complete discussion of the changes and the reasoning behind them. Additionally, a description of the approach used to evaluate sediment impairment in the Klamath River HU is presented in the response to comment #34.

Only in waterbodies where instream sediment data are available and those data exceed the evaluation guideline has Regional Water Board staff recommended listing.

All data submitted during the solicitation period for new data for the 2008 Integrated Report (submittal period closed February 28, 2007) were considered for inclusion in the Integrated Report. Those data which were determined to comply with the Listing Policy guidelines were evaluated and utilized in the decisions for the 2008 Integrated Report. If more recent data are available they should be submitted to the Regional Water Board and will be considered and become part of the record for the next listing cycle.

36. Comment(s)

- Classifying streams tributary to the Klamath River as impaired for sediment will accomplish little towards maintaining clean water in those tributaries that could not otherwise be negotiated with responsible local agencies while opening the door to irresponsible law suits.

Comment(s) Made By:
Glen O. Briggs - Seiad Valley, CA

Response:
Comment noted. Regional Water Board staff are actively working with responsible parties to attain and maintain water quality standards in the Klamath River basin both as part of and separate from the Integrated Report update.

37. Comment(s)

- Modeling and other assessment assumptions were used to assess impairment of the cold water fishery beneficial use (COLD) in the Klamath due to sediment. However, a healthy salmonid population exists. Until a compelling argument can be made that sediment is the cause of reduced numbers of salmon in Klamath tributaries, alleged sediment issues are nothing more than arbitrary opinions when it comes to the COLD beneficial use impairment.

Comment(s) Made By:
Ric Costales - County of Siskiyou

Response:
The decline of salmonid populations in the Klamath watershed has been widely documented. A summary of this decline is presented in “Fish and Fishery Resources of the Klamath Basin” (Carter and Kirk 2008, available at: http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/080711_ch_1_2/Appendix_2_Fish_and_Fishery_Resources_of_the_Klamath_River_Basin.pdf.

Modeling data is no longer being used in the assessment of sediment impairment of the Klamath River HU (see response to comment #34 for additional details).

Assessment of water quality standards attainment is required pursuant to the Federal Clean Water Act. This national guidance recommends that water quality standards are not met if any one of three types of data shows impairment. For example, exceedance for either a chemical, toxicological or biological evaluation guideline indicates impairment. The instream sediment data in some tributaries of the Klamath River HU do not meet evaluation guidelines, and thus these tributaries are proposed for inclusion on the 303(d) List for sediment impairment.

38. Comment(s)

- The US Forest Service - Klamath National Forest assessments should differentiate between natural and human-related contributions of sediment.
- The Regional Water Board assessment of these Klamath River data should include evaluation of sediment contributions from human-related sources (e.g. roads) versus natural sources (e.g. forest fire erosion and naturally occurring landslides).

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
Modeling data submitted by the USFS is no longer being utilized in the assessment of sediment impairment in the Klamath River HU (see response to comment #34 for additional details) for the 2008 Integrated Report. An assessment of contributions from human-related versus natural sources is done as part of the TMDL development process.

39. Comment(s)

- Much of the evidence for sediment impairment in the Klamath River Middle and Lower HA from the Scott to Trinity relies on the USFS cumulative watershed effects modeling information from 1999 (LOEs 25696, 25698, 25697). A more recent model run in 2004 shows watersheds have recovered from the fires which occurred in 1987. The Regional Water Board should use the 2004 modeling results to evaluate sediment impairment, not the 1999 modeling results. Based on sediment modeling results from 2004 (Elder and Reichert 2004), the USFS Klamath National Forest, using the weight of evidence approach described in the 2008 Integrated Report, recommend the following watersheds have “fully supporting” beneficial use ratings: Portuguese Creek, Fort Goff Creek. Rancheria Creek, Cliff Valley Creek, Upper Grider Creek, Upper Thompson Creek, Middle Thompson Creek, and Lower Thompson Creek.

Comment(s) Made By:
Patricia A. Grantham - USFS Klamath National Forest

Response:
Thank you for providing the 2004 model results. These data will be assessed and included in the record as part of the next listing cycle. The proposed sediment listings have changed since the Public Review Draft of the Integrated Report was issued. Please see response to Comment #34.

40. Comment(s)
- Based on sediment modeling results from 2004 (Elder and Reichert 2004), the USFS Klamath National Forest, using the weight of evidence approach described in the 2008 Integrated Report, recommend McKinney Creek watershed (Klamath River Middle HA, Iron Gate to Scott) as “not supporting” the beneficial uses.

Comment(s) Made By:
Patricia A. Grantham - USFS Klamath National Forest

Response:
See response to Comments #34 and #39.

41. Comment(s)
- The USFS has invested considerable effort in controlling sediment from the road system in Grider Creek and Thompson Creek. Road densities have been reduced, and the USFS expects values for embeddedness and fine sediment have been reduced as a result of reduced sediment inputs, though no recent stream survey data has been collected.

Comment(s) Made By:
Patricia A. Grantham - USFS Klamath National Forest

Response:
Analysis of embeddedness data for Grider and Thompson Creeks from the Thompson/Seiad/Grider Environmental Analysis (USFS 1999) reflect embeddedness values over the evaluation guideline (LOE 25692). When more recent data are available they should be submitted to the Regional Water Board for consideration in the next listing cycle.

42. Comment(s)
- The USFS and State Water Board have a Management Agency Agreement which provides for a USFS Water Quality Management Program based on Best Management Practices (BMPs). Between 2003 and 2008, sediment BMPs monitored on the Klamath National Forest were found to be effective in

96% of the incidents monitored. Thus, resource management activities in the Klamath National Forest provide a high level of protection for beneficial uses of water.

Comment(s) Made By:
Patricia A. Grantham - USFS Klamath National Forest

Response:
Comment noted. Regional Water Board staff look forward to continued coordination with Klamath National Forest staff in protecting the beneficial uses of the Klamath River basin.

43. Comment(s)

- The Portuguese and Fort Goff watersheds have sediment loads almost entirely from background sources and have not been significantly altered by human activities. In-channel conditions in these streams are some of the best available for this geology and channel type, and should be regarded as a reference for more managed watersheds.

Comment(s) Made By:
Patricia A. Grantham - USFS Klamath National Forest

Response:
Both Portuguese Creek and Fort Goff Creek exceeded the evaluation guideline for embeddedness, and thus consistent with the Listing Policy, Regional Water Board staff must recommend that they be placed on the 303(d) List for sediment impairment. The TMDL development process evaluates human-related versus natural sources. If the TMDL determines that the sediment loading to these creeks is from natural and not human-related sources, then no load reductions would be necessary.

44. Comment(s)

- The sediment listing proposal for the Beaver Creek Watershed is based on analysis of measurements made prior to a 1997 flood event (LOE 25689, 25690, 25691). A recent report (Cover et al. 2008) shows much improved stream channel conditions. The listing should be based on the most current data.

Comment(s) Made By:
Chris Quirmbach - Timber Products Company

Response:
All data submitted during the new data solicitation period for the 2008 Integrated Report (submittal period closed February 28, 2007) were considered for inclusion in the Integrated Report. Those data which were determined to comply with the

Listing Policy guidelines were evaluated and utilized in the decisions for the 2008 Integrated Report. All data submitted after February 28, 2007 will be considered, and become part of the record, for the next listing cycle. Thus, the data in Cover et al. 2008 will be evaluated during the next listing cycle. However, it should be noted that based on the evaluation guideline the sediment data reported in Cover et. al. supports the decision to list Beaver Creek as impaired by sediment.

## OCEAN ACIDIFICATION COMMENTS

45. Comment(s)
    - On June 11, 2008 the Center for Biological Diversity submitted scientific information concerning the latest findings on ocean acidification. In a letter dated January 16, 2009 the USEPA acknowledged the threat that ocean acidification presents to water quality. Ocean acidification data should be reviewed by the Regional Water Board and the ocean listed as impaired by acidification.
    - The Clean Water Act gives California the authority and duty to address ocean acidification.
    - Ocean waters should be listed as impaired by acidification. Ocean pH has changed significantly due to human sources of carbon dioxide. Recent surveys of the west coast show that northern California is being exposed to some of the most acidic waters due to ocean acidification (Feely et al. 2008).

    Comment(s) Made By:
    Miyoko Sakashita – Center for Biological Diversity

    Response:
    The data submitted by the Center for Biological Diversity within the submittal period (by 2/28/07) were reviewed by State Water Board staff. 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 listing.

## REDWOOD CREEK COMMENTS

46. Comment(s)
    - Supports the continued listing of Redwood Creek for impairment from high temperatures and sedimentation/siltation.
    - Provides references to additional information supporting the listing that are not currently used in any of the lines of evidence.

Comment(s) Made By:
Terrance D. Hofstra – U.S. Dept. of Interior/California Dept. of Parks and Recreation

Response:
Comment noted.

The information submitted supporting this existing listing will be considered, and become part of the record, for the next listing cycle. For the current listing cycle, interested persons were required to submit data by February 28, 2007. However, in the event that data were submitted in response to a proposal to list or delist a pollutant/water body combination in the Public Review Draft Staff Report for the 2008 Integrated Report for the Clean Water Act Section 205(b) Surface Water Quality Assessment and the 303(d) List of Impaired Waters (February 2, 2009), the data were preliminarily reviewed to determine whether questions were raised about the proposed change to the existing 303(d) List. If the data raises questions about the proposed change (either listing or delisting), the change will be postponed to the next listing cycle, and the list will go forward without the proposed change.

47. Comment(s)
- The Regional Water Board states that the presence of salmonids alone in Redwood Creek does not equal attainment of the water quality standard in the response to comment 15.1 of the Public Review Draft 2008 Integrated Report. Several studies are cited that show decline in the salmonid populations in Redwood Creek.

Comment(s) Made By:
Terrance D. Hofstra – U.S. Dept. of Interior/California Dept. of Parks and Recreation

Response:
The Regional Water Board staff response was directed at the comment that the stream should not be listed because there is an existing salmonid population. Staff did not intend to qualify the health of the salmonid population in Redwood Creek.

## MISCELANEOUS COMMENTS

48. Comment(s)
- Recommend the future listing of Lake Shastina for temperature, nutrients, dissolved oxygen, and pH. Both comment letters refer to documents, which the commentors state include data to support the above listings, and include a brief evaluation of the data to support listings.

Comment(s) Made By:
Crystal Bowman – Quartz Valley Indian Reservation
Petey Brucker – Klamath Forest Alliance
Erica Terence – Klamath Riverkeeper

Response:
For the current listing cycle, interested persons were required to submit data by February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the next listing cycle.

49. Comment(s)
- Supports the proposed listings of Green Valley Creek for pathogen indicator bacteria and low dissolved oxygen

Comment(s) Made By:
Tom Lyons – California Coastkeeper Alliance
Don McEnhill – Russian Riverkeeper

Response:
Comment noted.

50. Comment(s)
- Supports the proposed listings of Laguna de Santa Rosa for pathogen indicator bacteria.

Comment(s) Made By:
Tom Lyons – California Coastkeeper Alliance
Don McEnhill – Russian Riverkeeper

Response:
Comment noted.

51. Comment(s)
- Supports the continued listing of Humboldt Bay for Dioxin Toxic Equivalents.

Comment(s) Made By:
Tom Lyons – California Coastkeeper Alliance
Michelle D. Smith – Attorney for the Humboldt Baykeeper

Response:
Comment noted.

52. Comment(s)

- After establishing TMDL limits for the Elk River and Freshwater Creek, the Regional Water Board passed an exemption to the Pacific Lumber and Humboldt Redwood Corporation for Tier II zero-sediment logging. The exemption was based on a flawed "Landscape Reduction Model".

Comment(s) Made By:
Jerry Martien – Eureka, CA
Jerry Martien – Humboldt Watershed Council

Response:
There are no approved sedimentation TMDLs for Freshwater Creek or the Elk River.

The TMDL staff report for the Elk River is scheduled to be reviewed by the Regional Water Board in December 2009. The Freshwater Creek TMDL staff report is scheduled to be reviewed by the Regional Water Board in June 1010..

The "limits" referred to were not established through a TMDL process, but through Waste Discharge Requirements, and were intended to serve as an interim permitting strategy until the Elk River and Freshwater Creek TMDLs are completed. Once these TMDLs are completed, staff anticipate the Waste Discharge Requirements will be modified for conformity with their respective TMDL Action Plans.

53. Comment(s)

- The Little River should be listed as impaired for bacteria. Surfrider members have witnessed bad smells, experienced itchy skin and observed unnatural texture on the water surface.
- Requests a new listing of Little River and Widow White Creek for fecal coliform contamination.

Comment(s) Made By:
Jerry Martien – Humboldt Watershed Council
Jennifer Savage, et al. – Surfrider Foundation Humboldt Chapter

Response:
Visual observation data are allowed under the Listing Policy only as an ancillary LOE. If these visual observations can be documented and submitted to the Regional Water Board, they may be included as an ancillary LOE for the next listing cycle. Analytical data will be required to list for bacteria.

No fecal coliform data was submitted for the Little River or Widow White Creek during the data solicitation period for the 2008 Integrated Report. Any fecal

coliform data for these waterbodies that is submitted during the next data solicitation period for the next listing cycle will be analyzed to assess impairment.

54. Comment(s)
- The Regional Water Board should reconsider the applicability of coho temperature and condition requirements to the upper Klamath mainstem.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
The 2008 Integrated Report did not include an analysis of temperature conditions in the Klamath River. This analysis is being done as part of the Klamath River Temperature TMDL.

55. Comment(s)
- The Regional Water Board should review recent studies pertaining to water quality in the Fraser and Colombia Rivers and smolt survivability.
- The Regional Water Board should review recent studies pertaining to the record breaking 2008 Columbia sockeye return which refer to the fact that the dams have had a minuscule impact on habitat conditions compared to the impact of ocean conditions on the salmonids.
- The Regional Water Board should show evidence of an improvement in Klamath River conditions due to restoration projects that have been conducted in the last few decades.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
Comment noted. The Integrated Report is limited to addressing conditions within the North Coast Region of California. The Integrated Report does not address implementation actions, but these comments will be considered as part of the Klamath River Temperature and Dissolved Oxygen TMDLs.

56. Comment(s)
- The Regional Water Board should present substantive evidence that implementation “actions will bring naturally occurring water quality in the Klamath River into arbitrarily defined guidelines within your statutorily mandated reasonable timeline.”
- The Regional Water Board should considered the effects of “non natural water quality requirements on indigenous species adapted to those conditions” in the Klamath River.

Comment(s) Made By:
Rex Cozzalio – Hornbrook, CA

Response:
Comment noted. The Integrated Report is limited to addressing conditions within the North Coast Region of California. The Integrated Report does not address implementation actions, but these comments will be considered as part of the Klamath River Temperature and Dissolved Oxygen TMDLs.

57. Comment(s)
- Supports the listing of Russian River HU watersheds for indicator bacteria, dissolved oxygen, and DDT.

Comment(s) Made By:
Allison Gordon – Pacific Coast Federation of Fishermen's Association

Response:
Comment noted with the clarification that Regional Water Board staff has only proposed specific river reaches or subwatersheds for listing, and has not proposed listing the entire Russian River HU for indicator bacteria and dissolved oxygen. Additionally, the Guerneville HSA within the Russian River HU is no longer proposed to be listed on the 303(d) List for DDT impairment. Upon re-evaluation of the data it was discovered that the data do not exceed the evaluation guideline, and therefore it is inappropriate to list this HSA for DDT. A more detailed discussion of this change is in Appendix D.

58. Comment(s)
- Supports the listing of segments of the Klamath River for mercury.

Comment(s) Made By:
Allison Gordon – Pacific Coast Federation of Fishermen's Association

Response:
The Regional Water Board has not proposed a Klamath River listing for mercury. Data to support such a listing have not been made available to the Regional Water Board for assessment. However, the Regional Water Board has proposed Lake Shastina in the Klamath River HU, Shasta River HA for listing for mercury impairment.

59. Comment(s)
- Support the continued listing of the Elk River for sediment/siltation.

Comment(s) Made By:
Jerry Martien – Eureka, CA

Response:
Comment noted.

60. Comment(s)
- Supports the continued listing of the Trinity River, Redwood Creek, Mad River, Jacoby Creek, Freshwater Creek, Elk River, Van Duzen River, Eel River, and the Mattole River.

Comment(s) Made By:
Jerry Martien – Humboldt Watershed Council

Response:
Comment Noted.

61. Comment(s)
- USEPA completed the Van Duzen River TMDL for sediment in 1999. The draft 2008 Integrated Report identifies “Range Grazing-Upland”, “Range Grazing-Riparian”, and “Removal of Riparian Vegetation” as contributors to sediment in the Van Duzen River. Specific language from the TMDL report is cited that does not support identifying most cattle activities as sources of sediment pollution. An additional study (UCCE, 1999…not provided) shows the river is properly functioning and has a healthy macroinvertebrate population.

Comment(s) Made By:
Dina J. Moore – Yager/Van Duzen Environmental Stewards

Response:
The sources listed in the fact sheets for the Integrated Report were selected using best professional judgment of Regional Water Board staff. This source identification is not the same as the Source Analysis Section of a TMDL report. Sources identified in the Integrated Report database do not have any regulatory significance and are provided to show possible sources of the sediment problem, and does not represent a complete list or analysis of the relative importance of the sources listed. However, Regional Water Board staff have removed the source categories associated with grazing for Decision 6923.

62. Comment(s)

- The information presented in the new Integrated Report format is not readily accessible as prior listings. First, the Section 303(d) List should be presented separately from all other impaired water listings. Second, the priority categories of "High", "Medium", and "Low" should be reinstated.

Comment(s) Made By:
Daniel Myers – Redwood Chapter Sierra Club

Response:
Following approval by the Regional and State Water Boards, the 2008 303(d) List will be tabulated by State Water Board staff in the same format as the current 2006 303(d) List. The following three separate lists will be presented: 1) List of Water Quality Limited Segments Requiring TMDLs, 2) List of Water Quality Limited Segments Being Addressed by USEPA Approved TMDLs, and 3) List of Water Quality Limited Segments Being Addressed by Action Other Than TMDLs. The Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List states: "All water body-pollutant combinations on the section 303(d) list shall be assigned a TMDL schedule date." Therefore, on the List of Water Quality Limited Segments Requiring TMDLs the year that the TMDL is proposed for completion will be identified. The rationale for identifying the TMDL schedule data, as opposed to identifying a priority category, is detailed in the Functional Equivalent Document for the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (see Page 263 of the document, available at:
http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_093004.pdf.

63. Comment(s)

- The TMDL completion dates listed the Public Review Draft of the Integrated Report indicate the date that the USEPA approved the TMDL. Not all USEPA approved TMDLs have a Regional Water Board adopted implementation plan. There is no indication of when the Regional Water Board intends to adopt an Implementation/ Action Plan for the completed TMDLs listed.

Comment(s) Made By:
Daniel Myers – Redwood Chapter Sierra Club

Response:
Regional Water Board staff have edited Table 10 of the Integrated Report to provide clarity about which TMDLs have approved Action Plans and which do not.

On November 29, 2004, the Regional Water Board adopted via Resolution

R1-2004-0087 the Total Maximum Daily Load Implementation Policy Statement for Sediment Impaired Receiving Waters in the North Coast Region, also known as the Sediment TMDL Implementation Policy. The Sediment TMDL Implementation Policy is the TMDL implementation plan for the North Coast Region's sediment impaired Waterbodies that do not have a Board-approved implementation Plan (Action Plan). The Resolution also directed staff to develop a Work Plan that sets priorities for addressing excess sediment at a watershed-specific scale and describes how and when available authorities and permitting and enforcement tools will be used. The Regional Water Board Staff Work Plan to Control Excess Sediment in Sediment-Impaired Watersheds was completed in June 2008 via Resolution R1-2008-0057.

Regional Water Board staff anticipate addressing the development of implementation plans for the USEPA approved temperature TMDLs that don't have Regional Water Board approved Action Plans in a process similar to that described above for sediment TMDLs. This process would involve development of a TMDL Implementation Policy Statement for Temperature Impaired Waters in the North Coast Region that would set priorities for addressing temperature impairments at a watershed-scale and describing how and when available authorities and permitting and enforcement tools will be used. Regional Water Board staff anticipate development of this Policy and an associated Work Plan following completion of the Klamath River and Russian River watershed TMDLs.

64 Comment(s)

- Supports the continued listing of the Shasta River for organic enrichment/low dissolved oxygen and temperature.
- Supports the idea of developing a groundwater study for the Shasta River basin and supports the re-adjudication of surface and groundwater.

Comment(s) Made By:
Dr. Lowell L. Novy – Simi Valley, CA

Response:
Comment Noted. These comments were provided to the Regional Water Board staff implementing the Shasta River TMDLs.

65. Comment(s)

- The description of the mainstem of the Klamath River in Decision ID 13197 overlaps with the description of the mainstem Klamath River in Decision ID 13198 and is confusing for the reader.

Comment(s) Made By:
Chris Quirmbach - Timber Products Company

Response:
Thank you for the comment. Regional Water Board staff have rectified this issue in the Integrated Report database so that there is no overlap in the description of the mainstem segments.

# Appendix D: Summary of Significant Changes from the Public Review Draft

## PROCEDURE FOR HANDLING NEW DATA SUBMITTED DURING THE PUBLIC COMMENT PERIOD

For the 2008 listing cycle, interested persons were required to submit data by February 28, 2007. All data submitted after that date will be considered, and become part of the record, for the 2010 listing cycle. The only exception to this procedure occurred in the case of data that was submitted in response to the Public Review Draft Staff Report for the 2008 Integrated Report for the Clean Water Act Section 205(b) Surface Water Quality Assessment and the 303(d) List of Impaired Waters (Public Review Draft) (February 2, 2009). If new data was submitted in response to a proposal to list or delist a pollutant/water body combination, staff conducted a preliminary review to determine whether the data raised questions about the proposed change to the existing 303(d) List. If the late data raised questions about the proposed change (either listing or delisting), the decision to change the listing status was postponed to the next listing cycle, and the 303(d) List will go forward without the proposed change.

## CHANGES TO THE PUBLIC REVIEW DRAFT KLAMATH RIVER HU, MIDDLE AND LOWER RIVER HAs, PROPOSED SEDIMENT LISTINGS

The proposed sediment listings for the Klamath River HU, Middle and Lower HAs, have changed since the Public Review Draft of the Integrated Report was issued.

Originally, Regional Water Board staff made the recommendation to list watersheds within the Middle and Lower HAs of the Klamath River HU as sediment impaired based on readily available data, which included information on road density, landslide volume, surface erosion, percent fines, ratio of equivalent roaded area to threshold of concern (ERA/TOC), embeddedness, pool reduction, and cumulative impacts data. If a watershed exceeded the evaluation guideline for any one of these parameters, staff recommended in the Public Review Draft that the watershed be listed as sediment impaired. Additionally, in the Public Review Draft, the mainstem Klamath River in the reach encompassed by the watersheds proposed for listing was also considered to be sediment impaired and was proposed for listing.

Upon further consideration, Regional Water Board staff determined that the original approach for determining sediment impairment needed to be modified. Thus, Regional Water Board staff utilized the following approach to determine sediment impairment. This approach is supported by the Listing Policy (SWRCB 2004a) and Functionally Equivalent Document to the Listing Policy (SWRCB 2004b).

Instream sediment data (percent fines and embeddedness) was used as the primary evidence/basis for sediment impairment listings. Upslope information (road density

information), visual estimates of pool filling, and cumulative impacts data from USFS reports were used only as supporting evidence, not as the primary evidence for listing waterbodies.

The Listing Policy states that modeling information may only be used as supporting (ancillary) evidence, and not as the primary evidence for listing a waterbody. However, modeling data are no longer being utilized as supporting evidence in the Klamath River HU listing decisions, as public comments submitted on the Public Review Draft pointed out that the original modeling results from the USFS (USFS 1996; USFS 1999; USFS 2002; Boland 2001, Attachment F) utilized in the assessment of Klamath River HU sediment impairment were out-of-date and that newer results were available. The newer modeling information (USFS 2004) was submitted by the USFS during the public comment period. Due to the fact that these data were submitted after the solicitation period for new data for the 2008 Integrated Report (submittal period closed February 28, 2007) they will be considered, and become part of the record, for the next listing cycle. However, because the 2004 modeling results reflect different conditions than the original modeling data utilized in the Public Review Draft, it was determined that original modeling data were no longer current and would not be utilized.

Thus, Regional Water Board staff have only recommended sediment impairment listings for those waterbodies where instream sediment data are available and those data exceed the evaluation guideline. The waterbodies proposed for listing are discussed further in the “Klamath River Sediment Analysis” section of this report, beginning on P.17.

**CHANGES TO THE PUBLIC REVIEW DRAFT WOOLEY CREEK HSA PROPOSED TEMPERATURE DELISTING**

The proposed temperature delisting for the Wooley Creek HSA has changed since the Public Review Draft was issued. Regional Water Board staff are no longer recommending that the Wooley Creek HSA be delisted for temperature.

In the Public Review Draft of the Integrated Report, Regional Water Board staff recommended delisting the Wooley Creek HSA for temperature based on the determination that there was <15% human disturbance in the watershed, and thus, the high stream temperatures reported for the HSA were “natural” and met the Basin Plan natural receiving water temperature objective. Additional Lines of Evidence presented in the Public Review Draft as supporting evidence were road density, modeled landslide volumes, and modeled surface erosion volumes, all of which did not exceed their respective evaluation guidelines.

Based upon public comments and input by State Water Board staff, Regional Water Board staff reassessed the available information and determined that the original approach utilized in the Decision to propose delisting the Wooley Creek HSA needed to be re-evaluated.

First, the use of a disturbance index of <15% is an inappropriate tool for determining natural water temperature conditions in the watershed. Rather, evaluation of compliance with the Salmon River Watershed Temperature TMDL targets for effective shade should be completed in order to determine whether the temperature objective is being met, and therefore whether delisting is warranted. Regional Water Board staff are not aware of any effective shade data for Wooley Creek, and therefore staff can not assess whether the TMDL targets are being achieved and the natural stream temperature objective is being met. Compliance with the TMDL targets constitutes compliance with the objective, and would warrant delisting. To evaluate whether the TMDL target is being met, monitoring of riparian shade conditions and instream temperatures both need to be conducted. Since the TMDL is based on effective shade conditions, these conditions need to be monitored. Until these TMDL shade targets are met, Regional Water Board staff can not make a determination that the temperature objective is being met and that delisting is warranted.

Second, the Line of Evidence (LOE 21155) on human disturbance in the Wooley Creek watershed was not incorporated as supporting evidence into the Decision on Wooley Creek, as public comments submitted on the Public Review Draft included new information revealing that there may be more human-related disturbance in the watershed (particularly cattle grazing) than was previously identified. The new information submitted during the public comment period will be considered and the LOE will be updated for use in the next listing cycle.

Third, road density data is currently being utilized only as a supporting line of evidence in this Decision. Road density information is not an appropriate form of data to use as the primary basis for water temperature listing and delisting decisions.

Finally, modeling data from the USFS pertaining to landslide volumes and surface erosion values are no longer being incorporated in the water temperature Decision for the Wooley Creek HSA, as public comments submitted on the Public Review Draft pointed out that the modeling results were out-of-date and that newer results were available. In addition, the Functionally Equivalent Document to the Listing Policy states that modeling data can not be used as primary evidence. Newer modeling results were submitted by the USFS during the public comment period and will be considered as supporting evidence in the next listing cycle.

In summary, Regional Water Board staff do not recommend that the Wooley Creek HAS be delisted for temperature.

## CHANGES TO THE PUBLIC REVIEW DRAFT MAD RIVER HU PROPOSED DDE LISTING

The proposed Mad River HU DDE listing has changed since the Public Review Draft was issued. Regional Water Board staff are no longer recommending that the Mad River HU be listed for DDE, as discussed below.

One DDE sample collected in the mainstem Mad River was detected at a level of 0.004 ug/l, and one sample was detected not quantifiable (DNQ), with an estimated concentration of 0.001 ug/l (method detection limit of 0.001 ug/l, reporting limit of 0.002 ug/l). Both sample concentrations exceed the evaluation guideline for DDE of 0.00022 ug/l.

There were also an additional 10 samples from the mainstem Mad River, all of which were non-detect. However, these non-detect data could not be utilized in this assessment because the detection limit for DDE (0.001 ug/l) is above the evaluation guideline for DDE of 0.00022 ug/l. Per the Listing Policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis.

The one detection of DDE occurred in 2002 and the one DNQ of DDE occurred in 2003. All 9 subsequent DDE samples taken in the mainstem Mad River from April 2003 to June 2006 have been non-detect. Additionally, there have been 2 samples collected since June 2006, both of which were non-detect.

Based on the readily available data and information, Regional Water Board staff have determined that there is sufficient justification to not place this water segment-pollutant combination on the section 303(d) List in the Water Quality Limited Segments category at this time. The lack of any DDE "detections" in any watershed in the North Coast Region since 2003 has raised questions about the validity of the data from 2002 and 2003. Thus, Regional Water Board staff do not propose utilizing this information as the sole basis for listing. Additional sampling for DDE in the Mad River is part of the Regional Water Board's SWAMP 5-Year Monitoring Plan. When additional DDE data becomes available it will be assessed in future listing cycles, and the determination not to list the Mad River for DDE will be re-evaluated.

**DISCUSSION OF THE KLAMATH RIVER HU, SCOTT RIVER HA PROPOSED DDT DECISION NOT TO LIST**

Regional Water Board staff are recommending that the Klamath River HU, Scott River HA not be listed for DDT, as discussed below.

Two DDT samples collected in the mainstem Scott River were reported as detected not quantifiable (DNQ) and both sample concentrations exceed the DDT evaluation guideline of 0.00022 ug/l. The DNQ sample concentrations were reported as estimated values: 0.0027 ug/l and 0.003 ug/l (method detection limit of 0.002 ug/l, reporting limit of 0.005 ug/l).

There were an additional 21 samples collected from the mainstem Scott River, which were non-detect for DDT. However, these non-detect data could not be utilized in this assessment because the detection limit for DDT (0.002 ug/l) is above the evaluation guideline for DDT of 0.00022 ug/l. Per the Listing Policy, when a sample value is less than the quantitation limit, and the quantitation limit is greater than the evaluation guideline, the result shall not be used in the analysis.

The two DNQ values of DDT occurred in 2002 and 2003, and all 14 subsequent DDT samples taken in the mainstem Scott River from April 2003 to June 2006 have been non-detect. Additionally, there have been 6 samples collected since June 2006, all of which were non-detect.

Based on the readily available data and information, Regional Water Board staff have determined that there is sufficient justification to not place this water segment-pollutant combination on the section 303(d) List in the Water Quality Limited Segments category at this time. The lack of any DDT "detections" in any watershed in the North Coast Region since 2003 has raised questions about the validity of the data from 2002 and 2003. Thus, Regional Water Board staff do not propose utilizing this information as the sole basis for listing. Additional sampling for DDT in the Scott River is part of the Regional Water Board's SWAMP 5-Year Monitoring Plan. When additional DDT data becomes available it will be assessed in future listing cycles, and the determination not to list the Scott River for DDT will be re-evaluated.

**CHANGES TO THE PUBLIC REVIEW DRAFT RUSSIAN RIVER HA, GUERNEVILLE HSA PROPOSED DDT LISTING**

The proposed Russian River HA, Guerneville HSA DDT listing has changed since the Public Review Draft was issued. Regional Water Board staff are no longer recommending that the Russian River HA, Guerneville HSA be listed for DDT, as discussed below.

In the Public Review Draft, Regional Water Board staff recommended listing the Russian River HA, Guerneville HSA for DDT based on a review of available SWAMP data. Two of 2 samples collected in the Russian River HA had DDT concentrations which exceeded the evaluation guideline and thus, it was recommended for listing as DDT impaired.

Upon further review of the data, however, it was determined that only one of the 2 detections of DDT was in the Guerneville HSA; the other DDT detection was in the Geyserville HSA. This brought the number of detections to 1 of 1 for both HSAs, and according to Table 3.1 of the Listing Policy this does not exceed the minimum number of exceedances needed to place a water segment on the 303(d) List for toxicants. Therefore, it is not recommended that either the Guerneville HSA or the Geyserville HSA be listed for DDT.

**CHANGES TO THE GUALALA RIVER AND FOUR EEL RIVER PROPOSED ALUMINUM LISTINGS**

Regional Water Board staff are recommending that the Eel River HU (1) Lower Eel River HA, (2) Middle Fork HA, Eden Valley and Round Valley HSAs, (3) Middle Main HA, (4) South Fork Eel HA, and the Mendocino Creek HU, Gualala River HA, Gualala River be listed for aluminum. The proposed listings are new since the Public Review Draft was issued.

In the Public Review Draft, Regional Water Board staff made the determination that the aluminum levels in these waterbodies represent natural conditions and presented the following information in the Decisions for these waterbodies: "Aluminum is the most abundant metal and third most abundant of all elements in the earth's crust. Domestic tap water may contain aluminum either naturally, because it has been added as flocculent in the drinking water treatment process, or because of industrial processes that use aluminum. There are no known aluminum industrial processes occurring in any of these waterbodies. Any aluminum added from a drinking water treatment plant would not be represented in the samples collected in the river. Natural increases of aluminum-containing clay-sized particles in the water during higher flow rates and turbidity concentrations may be the cause of the aluminum exceedances."

Review of these Decisions and input from State Water Board and USEPA staff raised questions about this draft determination. Regional Water Board staff were informed that unless the Basin Plan had a site specific objective for aluminum, which stated that the levels of aluminum found in these waterbodies was natural, Regional Water Board staff must recommend these watersheds for inclusion on the 303(d) List for aluminum. There is no site specific objective for aluminum in these waterbodies and therefore, Regional Water Board staff now recommend that these waterbodies be placed on the 303(d) List for aluminum.

**CHANGES TO PROPOSED SCHEDULING OF THE MARK WEST CREEK DISSOLVED OXYGEN, NUTRIENTS, TEMPERATURE, AND SEDIMENTATION TMDLs**

The Mark West Creek watershed was listed as part of the entire Russian River watershed in 1998 for sediment and in 2002 for temperature. The 2019 schedule date for TMDL completion shown in the Public Review Draft applies to the entire Russian River watershed. However, sediment and temperature TMDLs for Mark West Creek are currently being developed as part of the larger Laguna de Santa Rosa watershed TMDL development effort. The Laguna de Santa Rosa TMDLs address low dissolved oxygen, high nutrients, high temperature and sedimentation water quality impairments. These TMDLs are planned for Regional Water Board consideration by November 2011, with USEPA approval expected in 2012.

# References for Appendix D

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