

WATER QUALITY CONTROL PLAN FOR THE NORTH COAST REGION

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NORTH COAST REGIONAL WATER QUALITY CONTROL BOARD

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1. INTRODUCTION

State and Regional Water Boards

In establishing the California Water Code, the California State Legislature assigned the primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board (State Water Board) and the nine regional water quality control boards.

The State Water Board sets statewide policies and plans for the implementation of state and federal laws and regulations. The regional water boards adopt and implement water quality control plans (basin plans), which recognize the unique characteristics of each region with regard to natural water quality; past, present, and potential beneficial uses; and water quality problems.

The jurisdiction of the North Coast Regional Water Quality Control Board (North Coast Water Board) extends from the California-Oregon state line southerly, to the southern boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma counties, and encompasses all basins draining into the Pacific Ocean, including Lower Klamath Lake and Lost River basins.

The North Coast Water Board is a seven member decision-making body, appointed by the Governor and confirmed by the State Senate. The Board holds regular meetings at different locations throughout the North Coast Region. The day-to-day work of the North Coast Water Board is carried out by civil service staff, both technical and administrative, under the direction of an Executive Officer appointed by the Board.

Function and Objectives of the Basin Plan

The North Coast Basin Plan is designed to provide a definitive program of actions to preserve and enhance water quality and protect beneficial uses of all regional waters. The Basin Plan addresses many factors and activities, which may affect water quality. It includes actions to be taken by the State Water Board and the North Coast Water Board.

Specifically, the Basin Plan:

- Designates beneficial uses of surface waters and groundwaters.
- Sets narrative and numeric objectives that must be attained or maintained to protect beneficial uses.
- Defines implementation programs that include specific prohibitions, action plans, and policies to achieve the water quality objectives.
- Describes the Regional Water Board's monitoring activities.

Additionally, the Basin Plan describes the North Coast Water Board's provisions for public participation and provides the framework for the development of discharge regulation. State Water Board water quality control plans and policies also apply within the North Coast Region.

The Basin Plan is the basis for the North Coast Water Board's regulatory programs. North Coast Water Board orders cite the Basin Plan's beneficial uses, water quality objectives, and prohibitions applicable to a particular discharge. The Basin Plan is used by other agencies in their permitting and resource management activities. Other state offices, departments, and boards shall comply with the Basin Plan when carrying out activities that may affect water quality unless otherwise directed or authorized by statute. The Basin Plan also serves as an educational document for the Regional Water Board's technical staff and dischargers. Finally, the Basin Plan provides valuable information to members of the public about local water quality issues.

Additional Water Planning Efforts

This Basin Plan is one of a number of regulations that directly or indirectly address water resources of the North Coast Region. The Department of Water Resources (DWR) developed the California Water Plan and updates it every five years. The California Water Plan calls for the orderly and coordinated control, protection, conservation, development, and use of the state's water resources. Once adopted, basin plans become part of the California Water Plan. The North Coast Water Board considers the effect of its actions on the California Water Plan, and any other general or coordinated governmental plan, looking toward the development, utilization, or conservation of water resources of the state.

Federally recognized Native American Tribes may also develop and implement water quality control plans as they can qualify for treatment in the same manner as states in accordance with section 518 (e) of the federal Clean Water Act. Under these provisions, the Hoopa Valley Tribal Council in the Klamath River watershed has adopted and is implementing its Water Quality Control Plan. Other tribes within the North Coast Region may also undertake processes to assess water quality and establish standards for waters under their jurisdiction.

All of the counties and cities in the North Coast Region are required to prepare general plans, which address conservation, development and use of natural resources, including water resources. Additional plans that address water resources in the North Coast Region are developed and distributed by federal, state, and local agencies, as well as watershed groups, stakeholders, and other organizations.

Legal Basis and Authority

The Basin Plan implements a number of state and federal laws. The most important are the California Porter-Cologne Water Quality Control Act and the federal Clean Water Act. Other pertinent state and federal laws include the California Health and Safety Code and the Federal Resource Conservation and Recovery Act.

The Porter-Cologne Water Quality Control Act (Porter-Cologne) is codified in the California Water Code (Water Code §§ 13000 et seq.) and authorizes the State Water Board to adopt, review, and revise policies for all waters of the state.

Porter-Cologne directs regional water boards to adopt, review, and revise basin plans, and provides specific guidance on factors that must be considered in adoption of water quality objectives and implementation measures. The format for basin plans as described in Water Code sections 13241-13247 follows a logical progression towards water quality protection.

The federal Clean Water Act is codified in the United States Code (33 U.S.C. §§ 1251 et seq.). Enacted by the federal government in 1972, the Clean Water Act is designed to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. One of the national goals states that wherever attainable, water quality should provide for the protection and propagation of fish, shellfish, and wildlife, and provide for recreation in and on the water (i.e., fishable, swimmable).

Section 303 of the federal Clean Water Act requires states to adopt water quality standards (which include water quality objectives, beneficial uses, and anti-degradation policies) for navigable waters of the United States and to review and update those standards on a triennial basis. Section 303(d) requires identification of waterbodies that are not meeting water quality standards and generally results in the development of total maximum daily loads (TMDL) or alternative implementation programs for these waterbodies to attain and maintain water quality standards. Under state law, a TMDL is to be accompanied by an implementation plan that will utilize a variety of regulatory mechanisms to ensure restoration of beneficial uses and attainment of water quality standards. Section 401 of the federal Clean Water Act requires that the state certify that a project subject to federal permitting, such as a dredge and fill activity, complies with all state water quality standards.

The US EPA has delegated responsibility for implementation of portions of the Clean Water Act to the State and Regional Water Boards, including the National Pollutant Discharge Elimination System (NPDES) program (33 U.S.C. § 1342). Direction for implementation of the Clean Water Act is provided by the Code of Federal Regulations and by a variety of US EPA guidance documents on specific subjects.

In addition to state and federal laws, several court decisions provide guidance for basin planning. For example, the 1983 Mono Lake Decision (National Audubon Society v. Superior Court (1983) 33 Cal. 3d 419) reaffirmed the public trust doctrine, holding that the public trust is "an affirmation of the duty of the state to protect the people's common heritage in streams, lakes, marshlands, and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust." Public trust encompasses uses of water for commerce, navigation, fisheries and recreation.

Triennial Review and Basin Plan Amendment Process

California Water Code section 13240 directs the State and Regional Water Boards to periodically review and update basin plans. The Clean Water Act (33 U.S.C. § 303(c)(1)) directs states to review water quality standards every three years (triennial review) and, as appropriate, modify and adopt new standards. The Triennial Review process allows the North Coast Water Board to keep pace with changes in regulations, new technologies and policies, and physical changes within the North Coast Region.

During the Triennial Review process, basin planning issues are formally identified and ranked. These and other modifications to the Basin Plan are implemented through basin plan amendments as described below. In addition, the North Coast Water Board can amend the Basin Plan as needed. Such amendments need not coincide with the Triennial Review process.

All basin plan and statewide plan amendments are subject to the California Environmental Quality Act (CEQA). The basin planning process has been certified by the Secretary of Resources as being exempt from CEQA's requirement for preparation of an environmental impact report (EIR) or negative declaration and initial study (Code of Regs., title 14, § 15251). Amending the Basin Plan involves the preparation of an amendment, environmental review, and a staff report.

Workshops may be held before formal action on an amendment is scheduled. Public input is solicited before formal action is taken. The public participation efforts are intended to foster public awareness through the open process of governmental decision-making. Input from interested persons may be through written correspondence, public workshop sessions, or at the hearing. Following a public review period and response to public comments, the North Coast Water Board can adopt the amendment at a public hearing. During the hearing, the Board considers testimony specific to the proposed amendment. This process allows the North Coast Water Board to consider each potential amendment on its own merits, to thoroughly identify the problem, to consider alternatives for action, and to assess the expected environmental impact of the proposed action.

Following adoption by the North Coast Water Board, basin plan amendments and supporting documents are submitted to the State Water Board for review and approval. The State Water Board may approve the amendments or remand them to the North Coast Water Board with directions for change. Basin plan amendments must be reviewed and approved by the State Office of Administrative Law (OAL). For purposes of state law, all amendments take effect upon approval by the OAL. Adoption or revisions of federal surface water standards are subject to the approval of the US EPA.

History of Basin Planning in the North Coast Region

The North Coast Water Board first adopted an interim Basin Plan in 1971. This was a brief document, which was used until comprehensive basin plans for its two natural hydrologic basins, the Klamath River Basin 1A and the North Coastal Basin 1B, were developed. These plans were adopted by the North Coast Water Board, and approved by the State Water Board in 1975. Also in 1975, the comprehensive plans were condensed into two abstracts, which were adopted by the North Coast Water Board and approved by the State Water Board.

In 1980, the hydrologic basin planning areas within California were redefined. The North Coast Region is Hydrologic Region Number 1. This hydrologic unit is divided into hydrologic areas and sub areas as shown on Figure 1-1, located on the [Basin Plan webpage](https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/180710/BPMap.pdf)

(https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/180710/BPMap.pdf). The Basin Plan webpage also includes an [interactive map of the region](#)

(<https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=3c441d71e7034227b776cae2f32c8d28>). On April 28, 1988, the North Coast Water Board combined and updated the two comprehensive plans and their abstracts into a single Water Quality Control Plan for the North Coast Region (Basin Plan).

The Basin Plan has been amended several times and will continue to be amended to serve the needs of the North Coast Water Board, its staff, and the public. Appendix 1 of this plan contains a summary of Basin Plan amendments adopted since 1975.

Setting of the North Coast Region

This section provides an overview of the environmental and socioeconomic setting of the North Coast Region, as well as a description of available water resources and water use for each hydrologic unit.

The North Coast Region is defined in section 13200(a) of Porter-Cologne as follows:

North Coast region, which comprises all basins including Lower Klamath Lake and Lost River Basins draining into the Pacific Ocean from the California-Oregon state line southerly to the southerly boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties.

The North Coast Region is divided into two natural drainage basins, the Klamath River Basin and the North Coastal Basin. The North Coast Region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou, and Sonoma Counties, and small portions of Glenn, Lake, Modoc, and Marin Counties.

County	Percent of County in the Region	Approx. Acres in the Region	Approx. Square Miles in the Region
Del Norte	100	648,320	1,013
Glenn	6	54,400	85
Humboldt	100	2,291,840	3,581
Lake	23	192,000	300
Marin	7	22,400	35
Mendocino	100	2,243,840	3,506
Modoc	28	751,360	1,174
Siskiyou	82	3,324,800	5,195
Sonoma	82	832,640	1,301
Trinity	100	2,051,200	3,205

The North Coast Region encompasses approximately 19,400 square miles, and includes 340 miles of scenic coastline and remote wilderness areas, as well as urbanized and agricultural areas.

The North Coast Region is characterized by distinct temperature zones. Along the coast, the climate is moderate and foggy and the temperature variation is minimal. However,

inland temperatures can range widely with seasonal variations in temperatures sometimes exceeding 100°F.

Precipitation over the North Coast Region is greater than for any other part of California, and floods can be a hazard.

The North Coast Region is abundant in surface water and groundwater resources. Although the North Coast Region constitutes only about 12% of the area in California, it produces about 41% of the annual runoff. This runoff contributes to flow in surface water streams, storage in lakes and reservoirs, and replenishment of groundwater.

California is divided into hydrologic regions. The North Coast Region is Hydrologic Region Number 1. There are 14 major surface water hydrologic units in the North Coast Region, as shown in Figure 1-1, located on the [Basin Plan webpage](https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/180710/BPMap.pdf) (https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/180710/BPMap.pdf). Each of these hydrologic units is divided into smaller units called hydrologic areas and hydrologic subareas. The Basin Plan webpage also includes an [interactive map of the region](https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=3c441d71e7034227b776cae2f32c8d28) (<https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=3c441d71e7034227b776cae2f32c8d28>).

DWR has identified 62 groundwater basins in the North Coast Region. Groundwater may also exist even where groundwater basins have not been identified. Groundwater basins do not always follow the same boundaries as surface waters.

Groundwater is used widely throughout the North Coast Region for municipal, domestic, agricultural, urban, and industrial water supply. The supply of groundwater in the North Coast Hydrologic Region varies yearly with precipitation, infiltration, and the amount of withdrawals from groundwater basins. Withdrawals are dependent on a number of factors, such as changes in surface water availability, urban and agricultural growth, market fluctuations, and water use efficiency practices. Groundwater extractions and uses vary by watershed. According to the DWR, groundwater contributes about one-third of the total water supply for agricultural, urban, and managed wetlands in the North Coast Region.

Ample precipitation in combination with the mild climate found over most of the North Coast Region provides for a wealth of fish, wildlife, and scenic resources. The mountainous nature of the North Coast Region, with its dense coniferous forests interspersed with grassy or chaparral-covered slopes, provides shelter and food for deer, elk, bear, mountain lion, furbearers, and many upland bird and mammal species.

The numerous streams and rivers of the North Coast Region contain anadromous fish, and the reservoirs, although few, support both coldwater and warmwater fish. The North Coast Region's native fish species include salmonids such as coho, Chinook, pink and chum salmon, as well as steelhead, coastal cutthroat and rainbow trout. Other native fish include green and white sturgeon, eulachon, Pacific and western brook lamprey, stickleback, five sculpin species, two sucker species, and several minnow species.

Healthy fisheries support the economy of the North Coast Region through commercial fishing and tourism. Further, riparian ecosystems are integral to the continued success of native fish populations, subsistence fishing and cultural uses.

From time immemorial, Native American Tribes along the North Coast have maintained relationships with culturally significant fisheries. Tribal community members throughout the North Coast Region rely on these fisheries for food and cultural uses.

Tribes throughout the North Coast Region have been working with federal, state, and local agencies to develop and implement monitoring programs and management strategies to improve water quality and quantity with the vision of preserving and protecting fisheries and watersheds. Western science and Traditional Knowledge recognize the complex relationships between waters and environmental systems in our watersheds.

The federal government has a responsibility to protect fisheries that are subject to tribal trust rights. This tribal trust responsibility applies to the Klamath and Trinity River systems, both of which run through tribal lands and are subject to tribal fishing rights.

Tidelands and marshes are extremely important to many species of waterfowl and shore birds for feeding and nesting. Cultivated land and pasturelands also provide supplemental food for many birds, including small pheasant populations. Tideland areas along the north coast provide important habitat for marine invertebrates and nursery areas for forage fish, game fish, and crustaceans. Many species of seabirds use offshore coastal rocks as nesting areas.

Major components of the economy are tourism and recreation, logging and timber milling, aggregate mining, commercial and sport fisheries, sheep, beef and dairy production, vineyards and wineries, and other agricultural operations.

The largest urban centers are located in the Eureka area of Humboldt County and in the Santa Rosa area of Sonoma County, the latter of which has experienced the highest population growth of all the counties within the North Coast Region. Numerous Native American communities are located throughout the region.

In all, the North Coast Region offers a beautiful natural environment with opportunities for scientific study and research, recreation, sport and commerce. To ensure their perpetuation, the resources must be used wisely.

The Klamath River Basin

The Klamath River Basin covers approximately 10,860 square miles within northern California, and includes the watersheds of Klamath, Smith, Trinity, Applegate, Illinois, and Winchuck Rivers, as well as the closed Lost River and Butte Valley hydrologic drainage areas. The Basin is bounded by the Oregon state border on the north, the Pacific Ocean on the west, Redwood Creek and Mad River hydrologic units on the south, and by the Sacramento Valley to the east. The Basin covers all of Del Norte County, and major portions of Humboldt, Trinity, Siskiyou, and Modoc counties.

The western portion of the Basin is within the Klamath Mountains and Coast Range provinces, and is characterized by steep, rugged peaks ranging to elevations of 6,000 to 8,000 feet with relatively little valley area. The mountain soils are shallow and often unstable. Precipitation ranges from 60 to 125 inches per year. The 45-mile coastline is dominated by a narrow coastal plain where heavy fog is common.

The eastern portion of the Basin receives low to moderate rainfall and includes predominantly high, broad valleys such as the Butte, Shasta, and Scott valleys.

The Klamath River Basin includes five hydrologic units: Winchuck River, Rogue River, Smith River, Klamath River, and Trinity River.

Winchuck River Hydrologic Unit (HU No. 101.00)

Most of the Winchuck River drainage lies in Oregon; only 18 square miles of drainage extends into Del Norte County in California. The watershed contains varied eco-regions including mountainous regions with high sediment loads, forest regions where forestry use is common, and agricultural and residential areas.

The Winchuck River Hydrologic Unit has no significant surface water development. Consumptive water uses in this unit include domestic, agricultural, and industrial water supply. No groundwater basin has been identified by DWR for this hydrologic unit.

Rogue River Hydrologic Unit (HU No. 102.00)

The Rogue River lies in Oregon. However, the headwaters of two of its major tributaries, the Illinois River and the Applegate River, extend into California, where their watersheds cover a total of approximately 150 square miles in Del Norte and Siskiyou counties of California. The majority of the Rogue River Hydrologic Unit lies within National Forest lands. The Rogue River was one of the original eight rivers named in the Wild and Scenic Rivers Act of 1968.

The Rogue River Hydrologic Unit has no significant surface water development. Consumptive water uses in this unit includes domestic, agricultural, and industrial water supply. No groundwater basin has been identified by DWR for this hydrologic unit.

Smith River Hydrologic Unit (HU No. 103.00)

The Smith River Hydrologic Unit covers approximately 704 square miles. The Smith River is one of the longest national wild and scenic rivers in the United States, and as such, there are no dams or significant surface water developments on the river. Domestic, agricultural, and industrial water needs are supplied through surface water diversions and groundwater pumping. DWR has identified one groundwater basin within this hydrologic unit; the Smith River Plain basin.

Klamath River Hydrologic Unit (HU No. 105.00)

The Klamath River Hydrologic Unit covers approximately 7,039 square miles and is divided into seven hydrologic areas: Lower Klamath River, Salmon River, Middle Klamath River, Scott River, Shasta Valley, Butte Valley, and Lost River. Water resources and water use are described for each hydrologic area in the following sections.

The Klamath River is a valuable ecological resource to California and Oregon. The Klamath River Basin provides important spawning habitat for Chinook salmon, coho salmon, and other fish species. The Klamath's lakes, marshes, tributaries, and tidal estuary have in the past supported multiple fish runs, resulting in the third largest salmon producing river on the west coast of the United States.

The Klamath River watershed is home to the largest population of Native American Tribes in California. Tribal people depend on the Tribal Trust species of the Klamath River for subsistence fishing purposes. The Trust species and races include, but are not limited to: coho salmon, Chinook salmon, steelhead trout, Pacific and non-anadromous lamprey eel, sturgeon, and eulachon. Sufficient numbers of Trust species must be maintained to sustain the primary dietary needs of the Klamath Basin Tribes. The federal allocation of salmon fishery to the Klamath Basin Tribes is 50 percent of the total available harvest.

Lower Klamath River Hydrologic Area (HU No. 105.10)

The Lower Klamath River Hydrologic Area is in the Coastal Range and Klamath Mountains provinces and covers approximately 771 square miles. Elevation ranges from sea level to over 1,000 feet. Annual precipitation ranges from 42 inches to 125 inches.

In the Lower Klamath River Hydrologic Area, domestic and agricultural water supplies are provided through surface water diversions and groundwater pumping. DWR has identified one groundwater basin in this hydrologic area; the Lower Klamath River Valley.

Salmon River Hydrologic Area (HU No. 105.20)

The Salmon River Hydrologic Area covers approximately 751 square miles in the Klamath Mountains province. Elevations in this hydrologic area range from approximately 450 feet to 8,560 feet. There are no dams, diversions, urban areas, nor major industry in the watershed, and as such, the water quality is very high. Annual precipitation ranges from 35 inches in the South Fork Salmon River Canyon to 85 inches in the headwaters.

Domestic water use in the Salmon River Hydrologic Area is supplied by surface water diversions and springs. No groundwater basins have been identified by DWR in this hydrologic area.

Middle Klamath River Hydrologic Area (HU No. 105.30)

The Middle Klamath River Hydrologic Area is in the Cascade Volcanics and Klamath Mountains provinces and covers approximately 1,615 square miles. Elevation ranges from 460 feet to over 2,000 feet. Annual precipitation ranges from 14 inches to 115 inches.

Domestic and agricultural water supply needs in the Middle Klamath Hydrologic Area are met through surface water diversions, groundwater pumping, and springs. DWR has identified two groundwater basins in this hydrologic area: Happy Camp Town Area and Seiad Valley.

Scott River Hydrologic Area (HU No. 105.40)

The Scott River Hydrologic Area covers approximately 814 square miles in the Klamath Mountains province. The valley floor elevation ranges from 2,500 to 3,000 feet, and surrounding mountains range up to 8,500 feet. Annual precipitation ranges from below 20 inches in the valley to over 70 inches in the western mountains.

Domestic and agricultural water supply needs in the Scott Valley Hydrologic Area are met through surface water diversions, groundwater pumping, and springs. One irrigation district and one private ditch company serve a small area on the east side of the valley. Approximately 32,000 acres are irrigated in the Scott Valley area. Increases in groundwater pumping for irrigation have prompted adjudication of groundwater in Scott Valley. All surface water rights in the Scott River Hydrologic Area above the U.S. Geological Survey gage station on the mainstem Scott River, and groundwater within a delineated interconnected groundwater area, are adjudicated. DWR has identified one groundwater basin in this hydrologic area; the Scott River Valley Basin.

Shasta Valley Hydrologic Area (HU No. 105.50)

The Shasta Valley Hydrologic Area covers approximately 790 square miles principally within the Cascade Range province. The valley floor elevation ranges from 2,500 to 3,000 feet, and surrounding mountains range up to 14,162 feet (Mt. Shasta). Annual precipitation ranges from less than 15 inches in the valley to more than 60 inches in the mountains.

In the Shasta Valley Hydrologic Area, domestic and agricultural water supply needs have historically been met through surface water diversions and from springs. Groundwater is used increasingly for domestic and agricultural supply. DWR has identified one groundwater basin in this hydrologic area, the Shasta Valley Basin. The principal water service agency in the Shasta Valley Hydrologic Area is the Montague Water Conservation District, which serves more than 10,000 of the approximately 46,000 acres irrigated in the watershed. The District's main supply source is 50,000 acre-foot Lake Shastina (also known as Dwinnell Reservoir) on the Shasta River. Several smaller irrigation districts in the Shasta Valley serve from 1,500 to 3,500 acres each.

Butte Valley and Lost River Hydrologic Areas (HU Nos. 105.80 and 105.90)

The Butte Valley and Lost River hydrologic areas cover of approximately 2,298 square miles in the Modoc-Oregon Lava Plateau. The area is characterized by broad valleys ranging from 4,000 to 6,000 feet in elevation. Typical annual precipitation is 15 to 25 inches. Groundwater is the primary source of domestic water supply in the Lost River Hydrologic Area. Groundwater basins identified by DWR in the Lost River Hydrologic area are Klamath River Valley and Fairchild Swamp Valley.

Water use in the Butte Valley Hydrologic Area comes mostly from groundwater pumping. Groundwater basins identified by DWR in the Butte Valley Hydrologic Area are Butte Valley, Bray Town Area, and Red Rock Valley. Approximately 23,000 acres are irrigated in Butte Valley. Water not used for irrigation is pumped from Meiss Lake to the Klamath River via drainage facilities operated by Meiss Lake Ranch in order to regulate the groundwater table.

The Bureau of Reclamation's Klamath Project, located in the Lost River Hydrologic Area, is the largest irrigation development in the Klamath River Basin. It serves irrigation water to approximately 210,000 acres of land in Oregon (62 percent) and the Lost River area of California (38 percent). The project's water supply is derived from the Klamath River in Oregon and the Lost River. The principal feature within the basin is the 527,000 acre-foot Clear Lake Reservoir on the Upper Lost River. Runoff and drainage reaching Tule Lake is pumped to Lower Klamath Lake for irrigation and wildlife refuge use. Water not used for irrigation in Lower Klamath Lake is pumped to the Oregon portion of the Klamath River via the Klamath Straits Drain to regulate the water table within the Tule Lake Irrigation District area. The Klamath Project serves a majority of the irrigable land in the Lost River watershed. The Tule Lake Irrigation District, the basin's largest, serves more than 60,600 acres in California with Klamath Project water.

Trinity River Hydrologic Unit (HU No. 106.00)

The Trinity River Hydrologic Unit covers approximately 2,970 square miles. In the Trinity River Hydrologic Unit, domestic, agricultural, and industrial water is supplied through surface water diversions, groundwater pumping, and springs. Groundwater basins identified by DWR in this hydrologic unit are Hayfork Valley, Hoopa Valley, Hyampom Valley, and Wilson Point Area.

The Trinity River Division of the Central Valley Project is the largest water development in the Klamath River Basin. The 538-foot-high Trinity Dam forms the 2.5 million acre-foot Trinity Lake (formerly Clair Engle Lake). Releases pass through the 140,000 kW Trinity Power Plant to Lewiston Reservoir (14,660 acre-foot capacity), from which water is diverted by tunnel to the Sacramento Valley.

The North Coastal Basin

The North Coastal Basin covers approximately 8,540 square miles along the north-central California Coast. The area is bounded on the west by the Pacific Ocean; on the north by the Klamath River and Trinity River basins; on the east by the Sacramento Valley drainage, consisting of the basins of Clear Lake, Putah and Cache Creeks, and the Napa River; and on the south by the Marin-Sonoma area. The North Coastal Basin covers all of Mendocino County, major portions of Humboldt and Sonoma counties, about one-fifth of Trinity County, and small portions of Glenn, Lake, and Marin counties.

Most of the North Coastal Basin consists of rugged forested coastal mountains dissected by six major river systems: the Eel, Russian, Mad, Navarro, Gualala, and Noyo rivers, and numerous smaller river systems. Soils are generally unstable and erodible, and rainfall is high. The area along the eastern boundary of the North Coastal Basin is mostly National Forest land administered by the United States Forest Service. Major population areas are centered in the Humboldt Bay and Santa Rosa areas.

Four hydroelectric power generation plants exist within the North Coastal Basin. R.W. Matthews Dam at Ruth Lake is equipped with a 2,000 kW facility. Cape Horn Dam on Van Arsdale Reservoir supports a 9,000 kW plant. Coyote Dam (also known as Coyote Valley Dam) at Lake Mendocino supports two power generation units with a combined capacity of 3,500 kW. Warm Springs Dam at Lake Sonoma is equipped with a 2,600 kW facility.

The North Coastal Basin is divided into nine hydrologic units: Redwood Creek, Trinidad, Mad River, Eureka Plain, Eel River, Cape Mendocino, Mendocino Coast, Russian River, and Bodega.

Redwood Creek and Trinidad Hydrologic Units (HU Nos. 107.00 and 108.00)

The Redwood Creek and Trinidad hydrologic units cover approximately 424 square miles and include Little River, Maple Creek, and Redwood Creek.

In the Redwood Creek and Trinidad hydrologic units, there are no significant surface water developments. Groundwater and surface water diversions supply most of the domestic and agricultural needs. Groundwater basins identified by DWR in these units are in the Prairie Creek Area, Redwood Creek Valley, and Big Lagoon Area.

Mad River and Eureka Plain Hydrologic Units (HU Nos. 109.00 and 110.00)

The Mad River and Eureka Plain hydrologic units cover approximately 724 square miles and include Elk River, Freshwater Creek, Humboldt Bay, Jacoby Creek, Mad River, and Salmon Creek.

In the Mad River and Eureka Plain hydrologic units, water supply is adequate to meet currently projected requirements. The only major surface storage is provided by the 48,030 acre-foot capacity Ruth Reservoir on the Mad River, which regulates municipal and industrial water supply for the Eureka/Arcata area by exporting Mad River water to the Eureka Plain subbasin. Groundwater basins have been identified by DWR in both of these hydrologic units. The main groundwater sources in the Eureka Plain are in the Elk River / Salmon Creek Area and the Jacoby Creek / Freshwater Creek Area.

Eel River Hydrologic Unit (HU No. 111.00)

The Eel River Hydrologic Unit covers approximately 3,682 square miles and includes seven major branches of the Eel River: the Upper Mainstem Eel River, Middle Mainstem Eel River, Lower Mainstem Eel River, North Fork Eel River, Middle Fork Eel River, South Fork Eel River, and the Van Duzen River.

The only major surface water development in the Eel River Hydrologic Unit is Lake Pillsbury, which is formed by Scott Dam, with a storage capacity of 74,993 acre-feet. This facility, in conjunction with Cape Horn Dam and the Potter Valley Tunnel, provides power and export of Eel River water to the Russian River. The City of Willits obtains its water supply from the 621 acre-foot capacity Morris Reservoir and the 504 acre-foot capacity Centennial Reservoir, both located on James Creek. Fifteen groundwater basins have been identified by DWR in this unit: Eel River Valley, Pepperwood Town Area, Larabee Valley, Hettenshaw Valley, Dinsmore Town Area, Laytonville Valley, Little Lake Valley, Weott Town Area, Garberville Town Area, Lower Laytonville Valley, Gravelly Valley, Sherwood Valley, Round Valley, Williams Valley, and Eden Valley.

Cape Mendocino Hydrologic Unit (HU No. 112.00)

The Cape Mendocino Hydrologic Unit covers approximately 499 square miles and includes the Bear and Mattole rivers and Oil Creek.

No significant surface water development has occurred in the Cape Mendocino Hydrologic Unit. Groundwater and surface water pumping are used for domestic supply in this unit. DWR has identified two groundwater basins in this unit: Mattole River Valley and Honeydew Town Area.

Mendocino Coast Hydrologic Unit (HU No. 113.00)

The Mendocino Coast Hydrologic Unit covers approximately 1,599 square miles and includes the Albion River, Alder Creek, Big River, Brush Creek, Caspar Creek, Elk Creek, Garcia River, Greenwood Creek, Gualala River, Navarro River, Noyo River, Pudding Creek, Ten Mile River, and Wages Creek.

Surface water storage in the Mendocino Coast Hydrologic Unit is minor, and includes Newman Reservoir on Newman Gulch, a tributary to the Noyo River. Surface water diversions and groundwater pumping are used to supply agricultural and domestic needs. DWR has identified eleven groundwater basins: Ten Mile River, Cottoneva Creek Valley, Branscomb Town Area, Little Valley, Fort Bragg Terrace Area, Big River Valley, Navarro River Valley, Anderson Valley, Garcia River Valley, Annapolis Ohlson Ranch Formation Highlands, and Fort Ross Terrace Deposits.

Russian River Hydrologic Unit (HU No. 114.00)

The Russian River Hydrologic Unit covers approximately 1,484 square miles. There are two surface water storage facilities in the Russian River Hydrologic Unit. Lake Mendocino stores imported Eel River water and East Fork Russian River water. Coyote Dam forms Lake Mendocino and has a maximum storage capacity of 122,400 acre-feet with 70,000 acre-feet allocated to water supply. Formed by Warm Springs Dam, Lake Sonoma is located on Dry Creek, a tributary to the Russian River. Lake Sonoma has a maximum storage capacity of 381,000 acre-feet.

DWR has identified a number of groundwater basins in this unit. These include: Potter Valley, Ukiah Valley, Sanel Valley, McDowell Valley, Cloverdale Area, Alexander Area, Alexander Valley, Healdsburg Area, Santa Rosa Plain, Santa Rosa Valley, Kenwood/Rincon Valley, Lower Russian River Valley, and Wilson Grove Formation Highlands. Groundwater is used for domestic supply by the cities of Ukiah, Windsor, Santa Rosa, Rohnert Park, and Sebastopol, as well as in unincorporated areas outside of the City of Santa Rosa. Russian River water also is exported to southern Sonoma County and northern Marin County for domestic use.

Bodega Hydrologic Unit (HU No. 115.00)

The Bodega Hydrologic Unit covers approximately 148 square miles and includes Bodega Bay, the Estero Americano and Stemple Creek, Estero de San Antonio and San Antonio Creek, and Salmon Creek.

The Bodega Hydrologic Unit has no significant surface water storage. One groundwater basin has been identified in the unit.

Water Quality Issues

In many cases, water quality within the North Coast Region is sufficient to support, and in some cases enhance the beneficial uses assigned to waterbodies in Chapter 2 of this

Basin Plan. However, there are a number of present or potential water quality issues, which may interfere with beneficial uses or create nuisances or health hazards.

Section 305 (b) of the Clean Water Act requires the State Water Board to compile surface water quality assessment information from each of the nine regional water boards on a biennial basis.

The US EPA uses these reports to prepare the National Water Quality Inventory Report to Congress, which characterizes water quality, identifies water quality problems, and describes various programs implemented to restore and protect water quality.

Water Quantity

The nexus between water quantity (i.e. supply) and water quality must be recognized when managing water and controlling pollution. For example, water rights that provide additional stream flows for fish and wildlife usually improve water quality, and those that reduce stream flows may reduce water quality.

The Division of Water Rights (Division) within the State Water Resources Control Board regulates water rights in order to develop, conserve and utilize in the public interest the water resources of the state, while protecting vested rights, water quality, and the environment. In determining water availability, the Division must consider the amount of water needed to remain instream for protection of beneficial uses whenever it is in the public interest. In acting on applications to appropriate water and other actions, the Basin Plan shall be considered and the Division may require terms and conditions necessary to carry out the Basin Plan.

Climate Change

Global climate change is altering long-recognized climatic patterns in the North Coast region, impacting water quantity and water quality and affecting beneficial use support, with consequences for human health and culture, commerce, ecosystem health, and hydrologic functions. Increases in greenhouse gas emissions and changes to carbon sequestration capacity have and will continue to cause an increase in global air and water temperatures, changes in precipitation patterns and increases in the intensity and frequency of extreme weather events, and sea level rise.

These changes in climate and weather are causing climate-induced hazards including extreme heat and increases in water temperature, drought, wildfire, intense rainfall and flooding, land inundation, and saltwater intrusion, each of which impact aquatic systems and ~~stress~~ beneficial uses. Observed climatic and weather changes in the North Coast include altered coastal fog regimes, extreme variation in precipitation patterns from prolonged drought and decreased snowpack to more frequent intense rainfall events, all of which impact watershed hydrology, causing desiccation of headwater streams and reduced stream baseflows and lower groundwater levels, as well as extreme flooding and associated erosion and sedimentation and pollutant mobilization.

Climate change is also identified as a causal factor in certain shifts in water quality conditions such as increases in stream temperature, elevated pollutant concentrations,

and altered geomorphic conditions. These climate change-induced changes to watershed hydrology and water quality can contribute to freshwater harmful algal blooms, shifts in aquatic habitat conditions and types, and changes in aquatic species composition. Further, ocean acidification, marine harmful algae blooms, hypoxia, and changes in marine species composition are also symptoms of climate change. Coastal flooding and erosion and groundwater level rise in coastal areas due to rising sea levels also increase the risk of damage to shoreline infrastructure, pollutant mobilization, drowning of coastal and estuarine habitats, and shifts in species composition.

The impacts of climate change can be compounded by site-specific conditions and factors and are manifested both at the site-specific and landscape scales. Further, the discharge of waste and other controllable water quality factors can exacerbate the impacts of climate change. Therefore, efforts to address the impacts of climate change in the North Coast Region require regional, cross-jurisdictional, collaborative, and multi-faceted approaches that maximize climate resilience.

2. BENEFICIAL USES

2.1 Introduction

The basis for the discussion of beneficial water uses, which follows, is Section 13050(f) of California's Porter-Cologne Water Quality Control Act, which states:

"Beneficial uses" of the waters of the state that may be protected against water quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

An essential part of a water quality control plan is an assessment of the beneficial uses, which are to be designated and protected. Table 2-1 identifies beneficial uses for each hydrologic area in the North Coast Region, as well as for specific waterbodies and broad categories of waters (i.e., bays, estuaries, minor coastal streams, ocean waters, wetlands, and groundwaters). Protection will be afforded to the present and potential beneficial uses of waters of the North Coast Region as designated and presented in Table 2-1. The beneficial uses of any specifically identified water body generally apply to all its tributaries.

Water quality standards are adopted to protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act (as defined in Sections 101(a)(2), and 303(c) of the Act). Water quality standards consist of 1) designated beneficial uses; 2) the water quality objectives to protect those designated uses; 3) implementation of the Federal and State policies for antidegradation; and 4) general policies for application and implementation. This chapter (Chapter 2) describes the beneficial uses of waters in the North Coast Region. Chapter 3 of the Basin Plan contains numeric and narrative water quality objectives, including an explanation of the state's *Policy for Maintaining High Quality of Waters in California* (Antidegradation Policy Resolution 68–16), designed to ensure that all designated beneficial uses of water in the region are maintained and protected. Chapters 4 through 6 contain the implementation plans and policies intended to meet water quality objectives and protect beneficial uses. Chapter 7 describes the regional and statewide monitoring and surveillance methods to measure achievement of the water quality objectives.

2.2 Beneficial Use Definitions

In 1972, the State Water Board adopted a uniform list of beneficial uses, including descriptions, to be applied throughout all basins of the State. This list was updated in 1996. In addition to the beneficial uses identified on the statewide list, the following uses have been identified in this Region: Three wetland beneficial uses, recognizing the value of protecting these unique waterbodies: Wetland Habitat (WET); Water Quality Enhancement (WQE); and Flood Peak Attenuation/ Flood Water Storage (FLD). The Native American Cultural (CUL) use and Subsistence Fishing (FISH) use have been added, identifying the traditional and cultural uses of waters within the Region.

The following beneficial uses are designated within the North Coast Region, presented alphabetically by commonly used abbreviation:

Agricultural Supply (AGR) Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Preservation of Areas of Special Biological Significance (ASBS) Includes marine life refuges, ecological reserves and designated areas of special biological significance, such as areas where kelp propagation and maintenance are features of the marine environment requiring special protection.

Aquaculture (AQUA) Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Cold Freshwater Habitat (COLD) Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Commercial and Sport Fishing (COMM) Uses of water for commercial, recreational (sport) collection of fish, shellfish, or other aquatic organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Native American Culture (CUL) Uses of water that support the cultural and/or traditional rights of indigenous people such as subsistence fishing and shellfish gathering, basket weaving and jewelry material collection, navigation to traditional ceremonial locations, and ceremonial uses.

Estuarine Habitat (EST) Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Flood Peak Attenuation/Flood Water Storage (FLD) Uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.

Subsistence Fishing (FISH) Uses of water that support subsistence fishing.

Freshwater Replenishment (FRSH) Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

Groundwater Recharge (GWR) Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Industrial Service Supply (IND) Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Marine Habitat (MAR) Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

Migration of Aquatic Organisms (MIGR) Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Municipal and Domestic Supply (MUN) Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Navigation (NAV) Uses of water for shipping, travel, or other transportation by private, military or commercial vessels.

Hydropower Generation (POW) Uses of water for hydropower generation.

Industrial Process Supply (PRO) Uses of water for industrial activities that depend primarily on water quality.

Rare, Threatened, or Endangered Species (RARE) Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Water Contact Recreation (REC-1) Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white-water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2) Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Inland Saline Water Habitat (SAL) Uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

Shellfish Harvesting (SHELL) Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

Spawning, Reproduction, and/or Early Development (SPWN) Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Warm Freshwater Habitat (WARM) Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Wetland Habitat (WET) Uses of water that support natural and man-made wetland ecosystems, including, but not limited to, preservation or enhancement of unique wetland functions, vegetation, fish, shellfish, invertebrates, insects, and wildlife habitat.

Wildlife Habitat (WILD) Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Water Quality Enhancement (WQE) Uses of waters, including wetlands and other waterbodies, that support natural enhancement or improvement of water quality in or downstream of a waterbody including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.

Key to Table 2-1

The list of beneficial uses in Table 2-1 reflects demands on the water resources of the North Coast Region. Water quality objectives (see Chapter 3) will adequately protect the quality of the waters of the Region for future generations.

Table 2-1 lists designated beneficial uses of inland surface waters by hydrologic unit, hydrologic area, hydrologic subarea, and in a few cases, by specific waterbody. General categories at the bottom of the table list the beneficial uses of bays/harbors, estuaries/lagoons, ocean waters, minor coastal streams, freshwater and saline wetlands, and groundwater.

Within Table 2-1, hydrologic unit, area, and sub-area numbers are shown as developed for the State's hydrologic basin planning system. For uniformity purposes, the Calwater system was developed by a State and Federal interagency committee in 1997. Calwater is a set of standardized watershed boundaries for California nested into larger previously standardized watersheds, which meet standardized delineation criteria.

“CALWATER (Rbuas) Number” This column contains a numeric identifier in a specified order representing specific subdivisions of drainage used by the Calwater classification system. The number follows the format below:

Hydrologic Region + Basin/ HU + HA + HSA

“Hydrologic Unit/Subunit/Drainage Feature” This column contains (in bold type) the names of watersheds and subwatersheds corresponding to the hydrologic unit (HU), hydrologic area (HA), or hydrologic subarea (HSA) number in the preceding column. The definitions of these area classifications are provided below.

HU: Hydrologic Unit Each hydrologic region is divided into hydrologic units, which are defined by surface drainage as well as topographic and geographic conditions. A hydrologic unit may encompass a major river watershed or a major groundwater basin,

contiguous watersheds with similar hydrogeologic characteristics, or a closed drainage area, such as a desert basin or group of such basins.

HA: Hydrologic Area Major subdivisions of hydrologic units. Best described as major tributaries of a river, large valley groundwater basin, or a component of a stream or desert basin group.

HSA: Hydrologic Subarea Consist of a major segment of a hydrologic area having significant geographical characteristics of hydrological homogeneity.

Drainage Feature/Waterbody An individual waterbody, which has been listed as a distinct feature of the hydrologic subunit in which it exists, based on unique designated beneficial uses.

Beneficial Uses The subheadings under this heading are abbreviations of beneficial uses, which are defined above. An “E” or a “P” in a column beneath one of these designates an existing or potential beneficial use for a given hydrologic area, sub-area or waterbody, respectively.

The complete list of beneficial uses follows:

AGR	Agricultural Supply	RARE	Rare, Threatened,
AQUA	Aquaculture	REC-1	Water Contact Recreation
ASBS	Preservation of Areas of Special Biological Significance	REC-2	Non-Contact Water Recreation
COLD	Cold Freshwater Habitat	SAL	Inland Saline Water Habitat
COMM	Commercial and Sport Fishing	SHELL	Shellfish Harvesting
CUL	Native American Culture Early Development	SPWN	Spawning, Reproduction, and/or
EST	Estuarine Habitat	WARM	Warm Freshwater Habitat
FISH	Subsistence Fishing	WET	Wetland Habitat
FLD	Flood Peak Attenuation/ Flood Water Storage	WILD	Wildlife Habitat
FRSH	Freshwater Replenishment	WQE	Water Quality Enhancement
GWR	Groundwater Recharge		
IND	Industrial Service Supply		
MAR	Marine Habitat		
MIGR	Migration of Aquatic Organisms		
MUN	Municipal and Domestic Supply		
NAV	Navigation or Endangered Species		
POW	Hydropower Generation		
PRO	Industrial Process Supply		

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHELL	SPWN	WARM	WET	WILD	WQE
101.00	Winchuck River Hydrologic Unit																											
	Winchuck River	E	P		E	E			E		E		E	E	E	P	P	E	E	E			E			E		
102.00	Rogue River Hydrologic Unit																											
102.20	Illinois River Hydrologic Area	E	E		E	E			E		E		E	E	E	E	P	E	E	E			E			E		
102.30	Applegate River Hydrologic Area	E	P		E	E			E		E		E	E	E	P	E	E	E	E			E			E		
103.00	Smith River Hydrologic Unit																											
103.10	Lower Smith River Hydrologic Area																											
103.11	Smith River Plain Hydrologic Subarea	E	P		E	E	E	E		E		E	E	E	E		P	E	E	E			E			E		
	Lake Talawa		P		E	E	E			E			E	P	E			E	E	E				E			E	
	Lake Earl	E	P		E	E	E			E		E		E	E	E			E	E	E				E		E	
	Crescent City Harbor		E		E	E				E			E	E		E			E	E	E		E		P		E	
103.12	Rowdy Creek Hydrologic Subarea	E	P		E	E				E		E		E	E	E	P	P	E	E	E			E			E	
103.13	Mill Creek Hydrologic Subarea	E	P		E	E				E		E		E	E	E	P	P	E	E	E			E			E	
103.20	South Fork Smith River Hydrologic Area	E	P		E	E	E			E		E		E	E	E	E	P	E	E	E			E			E	
103.30	Middle Fork Smith River Hydrologic Area	E	E		E	E	P			E		E		E	E	E	E	P	E	E	E			E			E	
103.40	North Fork Smith River Hydrologic Area	E	P		E	E				E		E		E	E	E	E	P	E	E	E			E			E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA /HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHELL	SPWN	WARM	WET	WILD	WQE
103.50	Wilson Creek Hydrologic Area	F	P		F	F	F			F		F		F	F	F	F	P	F	F	F			F			F	
105.00	Klamath River Hydrologic Unit																											
105.10	Lower Klamath River Hydrologic Area																											
105.11	Klamath Glen Hydrologic Subarea	F	P		F	F	F	F		F	F	P	F	F	F	F	P	P	F	F	F		F	F	F		F	
105.12	Orleans Hydrologic Subarea	F	P		F	F	F			F	F	F		F	F	F	P	P	F	F	F		P	F	F		F	
105.20	Salmon River Hydrologic Area																											
105.21	Lower Salmon Hydrologic Subarea	F	P		F	F	F			F		F		F	F	F	P	P	F	F	F		P	F			F	
105.22	Wooley Creek Hydrologic Subarea	P	P		F	F	F			F	F	F		F	F	F	P	P	F	F	F		P	F			F	
105.23	Sawyers Bar Hydrologic Subarea	F	P		F	F				F		F		F	F	F	P	P	F	F	F		P	F			F	
105.24	Cecilville Hydrologic Subarea	F	P		F	F				F		F		F	F	F	P	P	F	F	F		P	F			F	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHELL	SPWN	WARM	WET	WILD	WQE
105.30	Middle Klamath River Hydrologic Area																											
105.31	Ukonom Hydrologic Subarea	E	P		E	E	E			E	E	E		E	E	E	P	E	E	E	E			E	E		E	
105.32	Happy Camp Hydrologic Subarea	E	P		E	E	E			E	E	E		E	E	E	P	E	E	E	E			E	E		E	
105.33	Seiad Valley Hydrologic Subarea	E	P		E	E	E			E	E	E		E	E	E	P	E	E	E	E			E	E		E	
105.35	Beaver Creek Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	E	E	E	E			E	E		E	
105.36	Hornbrook Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	E	E	E	E			E	E		E	
105.37	Iron Gate Hydrologic Subarea	P	E		E	E				E		P		E	P	E	E	P	E	E	E		E	E	E		E	
105.38	Copco Lake Hydrologic Subarea	E	E		E	E				E		E		E	E	E	E	P	E	E	E			E	E		E	
105.40	Scott River Hydrologic Area																											
105.41	Scott Bar Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E			E	
105.42	Scott Valley Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	E	P	E	E	E			E			E	
105.50	Shasta Valley Hydrologic Area																											
	Shasta River & Tributaries	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E	
	Lake Shastina	E	P		E					E	E	P		P	P	E		P		E	E				E		E	
	Lake Shastina Tributaries	E	P		E	E				E	E	E		E	E	P	P	P		E	E			E	E		E	
105.80	Butte Valley Hydrologic Area																											

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																									
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHELL	SPWN	WARM	WET	WILD
105.81	Macdoel-Dorris Hydrologic Subarea	E	P		E	E					P		E	E		E	P	E	E	E			E	E		E	
	Meiss Lake	E	P		E					E	P			E			P		P	E				E		E	
105.82	Bray Hydrologic Subarea	E	P			E							E	E		P		E	E	E			E	E		E	
105.83	Tennant Hydrologic Subarea	E	P		E	P			E	E	P		E	E		P	P	P	E	E			E	P		E	

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
105.90	Lost River Hydrologic Area																											
105.91	Mount Dome Hydrologic Subarea	E	P		E	P				E	E	P		E	P		P	P	E	P	E			E	E		E	
105.92	Tule Lake Hydrologic Subarea	E	P		P	E				E	E	P		E	P			P	E	P	E			E	E		E	
105.93	Clear Lake Hydrologic Subarea	E	P		E	E				E	E	P		E	P	P	P	P	E	E	E		P	E	E		E	
105.94	Boles Hydrologic Subarea	E	P		E	E				E	E	P		E	P		P	P	E	P	E		P	E	E		E	
	Trinity River Hydrologic Unit																											
106.10	Lower Trinity River Hydrologic Area																											
106.11	Hoopa Hydrologic Subarea	E	P		E	E	E			E	E	E		E	E	E	P	P	E	E	E		P	E			E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
106.12	Willow Creek Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E		P	E			E	
106.13	Burnt Ranch Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E		P	E			E	
106.14	New River Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E		P	E			E	
106.15	Helena Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E		P	E			E	
106.20	South Fork Trinity River Hydrologic Area																											
106.21	Grouse Creek Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	
106.22	Hyampom Hydrologic Subarea	E	P		E	E				E	E	E		E	E	P	E	P	E	E	E			E			E	
106.23	Forest Glen Hydrologic Subarea	E	P		E	E				E	E	E		E	E	P	P	P	E	E	E			E			E	
106.24	Corral Creek Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	
106.25	Hayfork Valley Hydrologic Subarea	E	P		E	E				E	E	E		E	E		P	E	E	E	E			E			E	
	Ewing Reservoir		P		E	E						P			E	E		P	E	P	E				E		E	
106.30	Middle Trinity Hydrologic Area																											
106.31	Douglas City Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
106.32	Weaver Creek Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	
106.40	Upper Trinity River Hydrologic Area																											
	Trinity Lake (formerly Clair Engle Lake)	E	P		E	E				E	E	E		P	E	E	E	E	E	E			E	E		E		
	Lewiston Reservoir	E	E		E	E				E	E	P		P	E	E	E	P	E	E	E			E	P		E	
	Trinity River	E	E		E	E				E	E	P		E	E	E	P	P	E	E	E			E			E	
107.00	Redwood Creek Hydrologic Unit																											
107.10	Orick Hydrologic Area	E	P		E	E	E	E			E	E	E	E	E	E	P	P	E	E	E			E			E	
107.20	Beaver Hydrologic Area	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E			E	
107.30	Lake Prairie Hydrologic Area	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E			E	
108.00	Trinidad Hydrologic Unit																											
108.10	Big Lagoon Hydrologic Area	E	P	E	E	E	E	E		E	E	E	E	E	E	E		P	E	E	E			E			E	
108.20	Little River Hydrologic Area	E	P		E	E	E	E		E	E	E	E	E	P	E		P	E	P	E			E			E	
109.00	Mad River Hydrologic Unit																											
109.10	Blue Lake Hydrologic Area	E	E		E	E	E	E		E	E	E	P	E	E	E	P	E	E	E	E			E			E	
109.20	North Fork Mad River Hydrologic Area	E	P		E	E				E	E	E		E	E	E	P	E	E	E	E			E			E	
109.30	Butler Valley Hydrologic Area	E	P		E	E	E			E	E	E		E	E	E	P	E	E	E	E			E			E	
109.40	Ruth Hydrologic Area	E	P		E	E				E	E	E		E	E	E	E	E	E	E	E			E	E		E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																													
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE			
110.00	Eureka Plain Hydrologic Unit																														
	Jacoby Creek	E	P		E	E	E	E*		E	E	E		E	E	E	P	P	E	E	E			E			E				
	Freshwater Creek	E	E		E	E	E	E*		E	E	E		E	E	E	P	P	E	E	E			E			E				
	Elk River	E	P		E	E		E*		E	E	E		E	E	E	P	P	E	E	E			E			E				
	Salmon Creek	E	P		E	E	E	E*		E	E	E		E	E	E	P	P	E	E	E			E			E				
	Humboldt Bay	E	E		E	E	E	E*		E		E	E	E	E	E	P	P	E	E	E		E	E			E				
111.00	Eel River Hydrologic Unit																														
111.10	Lower Eel River Hydrologic Area																														
111.11	Ferndale Hydrologic Subarea	E	P		E	E	E	E		E	E	E	P	E	E	E	P	P	E	E	E		E	E			E				
111.12	Scotia Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E				
111.13	Larabee Creek Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E				
111.20	Van Duzen River Hydrologic Area																														
111.21	Hydesville Hydrologic Subarea	E	P		E	E	E			E	E	E		E	E	E	P	P	E	E	E			E	E		E				
111.22	Bridgeville Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E				
111.23	Yager Creek Hydrologic Subarea	E	E		E	E	E			E	E	E		E	E		P	P	E	E	E			E	E		E				

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																											
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE	
111.30	South Fork Eel River Hydrologic Area																												
111.31	Weott Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E		
111.32	Benbow Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E		
111.33	Laytonville Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E		
111.40	Middle Fork Eel River Hydrologic Area																												
111.41	Sequoia Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
111.42	Spy Rock Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
111.50	North Fork Eel River Hydrologic Area	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
111.60	Upper Main Eel River Hydrologic Area																												
111.61	Outlet Creek Hydrologic Subarea	E	E		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E		
111.62	Tomki Creek Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E		
111.63	Lake Pillsbury Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
111.70	Middle Fork Eel River Hydrologic Area																												

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
111.71	Eden Valley Hydrologic Subarea	E	E		E	E				E		E		E	E	E	P	P	E	E	E			E	E		E	
111.72	Round Valley Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E			E	P		E	
111.73	Black Butte River Hydrologic Subarea	E	P		E	E				E		E		E	E	E	E	P	E	E	E			E	E		E	
111.74	Wilderness Hydrologic Subarea	E	P		E	E				E		E		E	E	E	E	P	E	E	E			E	E		E	
112.00	Cape Mendocino Hydrologic Unit																											
112.10	Oil Creek Hydrologic Area	E	E		E	E	E	E		E		E		E	P		P	P	E	E	E			E			E	
112.20	Capetown Hydrologic Area	E	P		E	E	E			E	E	E		E	E	E	P	P	E	E	E			E			E	
112.30	Mattole River Hydrologic Area	E	E		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E	P		E	
113.00	Mendocino Coast Hydrologic Unit																											
113.10	Rockport Hydrologic Area	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.11	Usal Creek Hydrologic Subarea	P			E	E				E	E	P		E	E	E	P	P	E	E	E			E			E	
113.12	Wages Creek Hydrologic Subarea	E			E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	
113.13	Ten Mile River Hydrologic Subarea	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.20	Noyo River Hydrologic Area	E	E		E	E		E		E	E	E		E	E	E	E	P	E	E	E			E			E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
113.30	Big River Hydrologic Area	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.40	Albion River Hydrologic Area	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.50	Navarro River Hydrologic Area	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.60	Pt Arena Hydrologic Area																											
113.61	Greenwood Creek Hydrologic Subarea	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.62	Elk Creek Hydrologic Subarea	P	P		E	E		E		E	E	E		E	P	E	P	P	E	E	E			E			E	
113.63	Alder Creek Hydrologic Subarea	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.64	Brush Creek Hydrologic Subarea	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E			E			E	
113.70	Garcia River Hydrologic Area	E	P		E	E		E		E		E		E	E	E	P	P	E	E	E			E			E	
113.80	Gualala River Hydrologic Area																											
113.81	North Fork Gualala Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	P	P	E	E	E			E			E	
113.82	Rockpile Creek Hydrologic Subarea	E	P		E	E		E			E	E		E	E	E	P	P	E	E	E			E	E		E	
113.83	Buckeye Creek Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E	

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																											
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE	
113.84	Wheatfield Fork Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E		
113.85	Gualala Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E			E	E		E		
113.90	Russian Gulch Hydrologic Area	E	E		E	P					E	E		E	E			P		E	E	E		E			E		
114.00	Russian River Hydrologic Unit																												
114.10	Lower Russian River Hydrologic Area																												
114.11	Guerneville Hydrologic Subarea	E	P		E	E		E		E	E	E		E	E	E	P	P	E	E	E		P	E	E		E		
114.12	Austin Creek Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E		
114.20	Middle Russian River Hydrologic Area																												
114.21	Laguna Hydrologic Subarea	E	P		E	E				E	E	E		E	P	E	E	P	E	E	E		P	E	E		E		
114.22	Santa Rosa Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E		P	E	E		E		
114.23	Mark West Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E		P	E	E		E		
114.24	Warm Springs Hydrologic Subarea	E	E		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
114.25	Geyserville Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	P	P	E	E	E		P	E	E		E		

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																											
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE	
114.26	Sulphur Creek Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E		
114.30	Upper Russian River Hydrologic Area																												
114.31	Ukiah Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E		P	E	E		E		
114.32	Coyote Valley Hydrologic Subarea	E	P		E	E				E	E	E		E	E	E	E	P	E	E	E			E	E		E		
114.33	Forsythe Creek Hydrologic Subarea	E	P		E	E					E	E		E	E	E	P	P	E	E	E			E	E		E		
115.00	Bodega Hydrologic Unit																												
115.10	Salmon Creek Hydrologic Area	E	P		E	E		E			E	E		E	E	E		P	E	E	E		P	E			E		
115.20	Bodega Harbor (or Bay) Hydrologic Area	E	E		E	E					E	E	E	E	E	E		P	E	E	E		E	E			E		
115.30	Estero Americano Hydrologic Area	E	P		E	E		E			E	E	E	E	E	E		P	E	E	E		P	E			E		
115.40	Estero de San Antonio Hydrologic Area	E	P		E	E		E			E	E	E	E	E	E		P	E	E	E		P	E			E		
	Minor Coastal Streams (not listed above**)	P	P		P	E	P	E		P	P	P	P	P	E	P		P	E	P	P			P	P		E		
	Ocean Waters		E	P		E						P	E	E		E		P	E	E	E		E	E			E		
	Bays		P		E	E	P	P				P	E	E		E		P	P	P	E		E	E	P		E		

TABLE 2-1: BENEFICIAL USES OF WATERS OF THE NORTH COAST REGION

HU/HA/ HSA	HYDROLOGIC UNIT/AREA/ SUBUNIT/DRAINAGE FEATURE	BENEFICIAL USES																										
		AGR	AQUA	ASBS	COLD	COMM	CUL	EST	FLD	FRSH	GWR	IND	MAR	MIGR	MUN	NAV	POW	PRO	RARE	REC1	REC2	SAL	SHEL	SPWN	WARM	WET	WILD	WQE
	Saline Wetlands		P		P	P	P	P	P	P	P	P	P		P			P	P	P	P	P	P	P	P	E	P	P
	Freshwater Wetlands	P	P		P	P	P	P	P	P	P		P	P	P			P	P	P		P	P	P	P	E	P	P
	Estuaries	P	P		E	P	P	E		P		P	E	E	P	E	P	P	P	E	E		E	E	P		E	
	Groundwater	E	P				E					E			E			P										

Waterbodies are grouped by hydrologic unit (HU) or hydrologic area (HA).

*EST use applies only to the estuarine portion of the waterbody as defined in Chapter 2

**Permanent and intermittent

P = Potential

E = Existing

2.3 Identifying Present and Potential Beneficial Uses

In the basin planning process, a number of beneficial uses are usually identified for a given body of water. At a minimum, states must designate uses that are attainable whether or not they are currently being attained. Attainable uses are uses that can be achieved when technologies are implemented to achieve effluent limits under Section 306 of the Clean Water Act and when cost-effective and reasonable Best Management Practices (BMPs) are imposed.

Water quality objectives are established (see Chapter 3) to be sufficiently stringent to protect the most sensitive use. The North Coast Water Board reserves the right to resolve any conflicts among beneficial uses, based on the facts in a given case. It should be noted that the assimilation of wastes is not a beneficial use.

In the table of beneficial uses (Table 2-1), an “E” indicates an existing use and a “P” indicates a potential use. Biological data, human use statistics, and/or professional experience documents the existing uses. Existing uses are those uses, which were attained in a waterbody on or after November 28, 1975.¹ Existing uses cannot be removed or modified unless a use requiring more stringent criteria is added. However, a use requiring more stringent criteria can always be added because doing so reflects the goal of further improvement of water quality.

Waterbodies may have potential beneficial uses established for any of the following reasons: 1) the use existed prior to November 28, 1975, but is not currently being attained; 2) plans already exist to put the water to that use; 3) conditions make such future use likely; 4) the water has been identified as a potential source of drinking water based on the quality and quantity available (see *Sources of Drinking Water Policy*, in Appendix 7); 5) existing water quality does not support these uses, but remedial measures² may lead to attainment in the future; or 6) there is insufficient information to support the use as existing, however, the potential for the use exists and upon future review, the potential designation may be re-designated as existing. The establishment of a potential beneficial use can have different purposes such as establishing a water quality goal, which must be achieved through control actions in order to re-establish a beneficial use, or serving to protect the existing quality of a water source for eventual use.

Many communities in the North Coast Region depend on surface waterbodies for their municipal water supply. These waterbodies include the Smith, Mad, and Russian Rivers. Agricultural water use is distributed over more areas than domestic, municipal and industrial use, as it is present in all of the hydrologic units within the region.

¹ Date of the first Water Quality Standards Regulation published by USEPA (November 28, 1975) 40 CFR 131.3 (e).

² Remedial measures include implementation of effluent limits required under Section 301(b) and 306 of the CWA, and implementation of cost-effective and reasonable best management practices for nonpoint source control. 40 CFR 131.10(d).

Recreational use occurs in all hydrologic units on both fresh and salt water. Water recreation areas in the North Coast Region attract over ten million people annually and the numbers are expected to keep growing. This area has rugged natural beauty and some of the most renowned fishing streams in North America. The North Coast Region has many unique characteristics: diverse topography including a scenic ocean shoreline, diverse forest environments including a large forested belt which has more than half of California's redwoods, and extensive inland mountains.

Coastal areas receiving the greatest recreational use have been the ocean beaches, the lower reaches of rivers flowing to the ocean, and Humboldt and Bodega Bays. Rivers receiving the largest levels of recreational use are the Russian, Eel, Mad, Smith, Trinity, Navarro Rivers, and Redwood Creek. Activities cover the spectrum of water-oriented recreation. Fishing, river rafting, kayaking, and canoeing being popular on the rivers, and fishing, clamming, beach combing, and surfing predominating at the ocean beaches and bays. Photography, painting, bird watching, and sightseeing are important recreational activities, which take place throughout the entire North Coast Region.

Virtually all surface waters are home to fish and wildlife in the North Coast Region. Coastal waters and streams support anadromous fish, which are important for both sport and commercial fishing. Historically, coastal and inland streams in the Region provided thousands of miles of habitat suitable for salmon and steelhead. Recent focus has been placed on re-establishment of the once productive anadromous salmonid runs in the North Coast Region through habitat restoration and educational outreach. Humboldt and Bodega Bays support shellfish and fish populations, which are very important to the commercial fishing industry and to the recreationalist. Both bays also provide refuge for wildlife populations especially waterfowl, shorebirds, and other water-associated birds.

Many of the watersheds of the North Coast Region support plant and wildlife species that are considered rare, threatened, and endangered. A few examples include the Swainson's hawk (*Buteo swainsoni*), Bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus tundrius*), Coho Salmon (*Oncorhynchus kisutch*), Chinook Salmon (*Oncorhynchus tshawytscha*), Lost River sucker (*Deltistes luxatus*), Shortnose sucker (*Chamistes brevirostris*), California freshwater shrimp (*Syncaris pacificaz*), Baker's larkspur (*Delphinium hesperium* sp. Cuyamaca), and Sebastopol meadowfoam (*Limnanthes vinculans*), all of which have been observed in watershed areas within the North Coast Region.

Navigation is vital to the economy of the North Coast Region. There are fishing ports at Crescent City, Eureka, Fort Bragg, and Bodega Bay. The principal commercial harbor between San Francisco and Coos Bay, Oregon, is the Port of Eureka located at Humboldt Bay.

Hydroelectric power generation in the North Coast Region occurs at Trinity Dam, located at Trinity Lake (formerly Clair Engle Lake); Matthews Dam located at Ruth Lake on the Mad River; the Potter Valley Project located at Van Arsdale Reservoir on the Eel River; Coyote Dam located at Lake Mendocino on the East Fork of the Russian River; and Warm Springs Dam on Dry Creek, a tributary to the Russian River.

2.4 Designation of the RARE Beneficial Use

The Rare, Threatened, or Endangered Species (RARE) beneficial use designation was based, in part, on the information contained within the California Department of Fish and Wildlife's California Natural Diversity Data Base (CNDDDB). The CNDDDB tracks the location and condition of federal and state listed rare, threatened, endangered, and sensitive plants, animals and natural communities. The CNDDDB is the most complete single source of information on California's rare, endangered, threatened and sensitive species, and natural communities. However, the absence of a special animal, plant, or natural community from the CNDDDB report does not necessarily mean that they are absent from the area in question, only that no occurrence data was entered in the CNDDDB inventory as of January 2001. Supplemental information was collected by interviewing biologists with the California Department of Fish and Wildlife and the U.S. Forest Service regarding the presence of rare, threatened and endangered species.

The RARE designation is added based on substantial evidence that the waterbody supports threatened or endangered species. By definition, waterbodies with a RARE designation support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered. The North Coast Water Board can provide specific information about the sighting(s) used to designate the RARE beneficial use. However, it is the responsibility of the lead agency or project sponsor to provide adequate information as to whether a proposed project will affect fish and wildlife (including plants) and their habitats.

The RARE beneficial use is generally, but not always, present throughout the entire reach of a particular waterbody. In addition, the RARE beneficial use may not be present throughout the year. The RARE designation is placed on bodies of water where the protection of a threatened or endangered species depends on the water either directly, or to support its habitat. The purpose of the RARE designation for a particular hydrologic subarea or waterbody is to highlight the existence of the threatened or endangered species. This will ensure that, absent extraordinary circumstances, RARE species are not placed in jeopardy by the quality of the discharges to those waterbodies.

Recognition that a waterbody is used by threatened or endangered species (RARE) does not necessarily mean that any particular suite of water quality objectives will be applied to the water body. In the absence of RARE species, the North Coast Water Board would rely on the aquatic habitat uses. These include Cold Freshwater Habitat (COLD), Warm Freshwater Habitat (WARM), Estuarine Habitat (EST), Marine Habitat (MAR), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Wildlife Habitat (WILD).

2.5 Beneficial Uses for Specific Waterbodies

Beneficial uses are designated for all waters in the North Coast Region. The waterbodies are separated into various categories. Wetlands and groundwater are described outside of the Coastal and Inland Waters categories, as they are unique waterbodies that require more detailed descriptions. Freshwater and saline wetlands are combined for the purposes of discussion on wetlands, but separated in Table 2-1 for the purpose of designation of beneficial uses. Each waterbody category is defined below as follows.

2.5.1 Coastal Waters

Coastal waters discussed in this section may be defined as waters subject to tidal action and include ocean waters, enclosed bays, harbors, estuaries, and lagoons. Beneficial uses for these coastal waters generally include, but are not limited to: Water Contact and Non-contact Water Recreation (REC-1, REC-2), Estuarine Habitat (EST), Rare, Threatened or Endangered Species (RARE), Wildlife Habitat (WILD), Marine Habitat (MAR), Shell Fish Harvesting (SHELL), Saline Habitat (SAL), and Navigation (NAV). Coastal waters include the subcategories: ocean waters, enclosed bays, and estuaries as described below.

Ocean Waters

Ocean waters are territorial marine waters of the North Coast Region as defined by California law to the extent that these waters are outside of enclosed bays, estuaries, and coastal lagoons.

Enclosed Bays

Enclosed bays are indentations along the coast, which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest difference between the headlands or outermost harbor works is less than seventy-five percent of the greatest dimension of the enclosed portion of the bay. These areas are generally more sheltered from wave action than the open coast and are relatively shallow (less than 30m in depth).

Large shallow inlets and enclosed bays are complex systems interlinking the terrestrial and aquatic environments and composed of an interdependent mosaic of subtidal, intertidal, and surrounding terrestrial habitats. Enclosed bays do not include inland surface waters or ocean waters.

Estuaries

Estuaries are the tidal portions of rivers located at the mouths of streams, which are sometimes temporarily separated from the ocean by sandbars. Estuarine waters extend from a bay or the open ocean to a point upstream where the freshwater of the river mixes with the saline ocean water.

Estuarine coastal waters provide protective habitat for marine life (MAR), including shellfish, and support the migration (MIGR) of aquatic organisms including anadromous salmonids. These waters are also used extensively for Water Contact and Non-Contact Water Recreation (REC-1, REC-2), Navigation (NAV), and Commercial and Sport Fishing (COMM), among others.

All coastal lagoons of the North Coast Region are included in the estuaries category. The mouths of most of the rivers and creeks are continually affected by tidal action and present a relatively stable environment for wildlife and vegetation. Other coastal lagoons may be separated from tidal action by earthen deposits and thus present an environment with major seasonal variations. Such conditions result in the development of a unique biologic community highly specific to that area. Occasionally, the mouths of these coastal lagoons are opened subjecting the lagoons to tidal flushing which causes short-term changes to

the habitat conditions and enhancement of the recreational uses. The action would not alter the categories of beneficial uses of the coastal lagoons.

2.5.2 Inland Surface Waters

Inland surface waters consist of rivers, streams, lakes, reservoirs, and inland wetlands. Beneficial uses of these inland surface waters and their tributaries are designated on Table 2-1.

Rivers and Streams

Beneficial uses of inland surface waters generally include Water Contact Recreation (REC-1); Cold Freshwater Habitat (COLD); Warm Freshwater Habitat (WARM); Spawning, Reproduction, and Development (SPWN); Migration of Aquatic Organisms (MIGR); and Commercial and Sport Fishing (COMM), reflecting the goals of the federal Clean Water Act. Inland waters are also often designated with Agricultural Water Supply (AGR), Industrial Water Supply (IND), Industrial Process Supply (PRO), Non-contact Water Recreation (REC-2), and Wildlife Habitat (WILD) uses. In addition, inland waterbodies are sometimes designated with Rare, Threatened or Endangered Species (RARE) uses. Many Regional streams are primary sources of replenishment for major groundwater basins that supply water for drinking and other uses, and as such must be protected as Groundwater Recharge (GWR). Inland surface waters that meet the criteria mandated by the Sources of Drinking Water Policy (State Water Board Resolution No. 88-63) are designated Municipal and Domestic Supply (MUN). Several waterbodies have been designated with the Native American Cultural (CUL) beneficial use, which is applied when there is information available indicating that waters were historically used for cultural purposes meeting the definition of CUL.

Lakes and Reservoirs

Lakes and reservoirs are depressions that are natural or artificial impoundments of water used for irrigation, municipal water supply, recreation, and hydroelectric power generation, among others. These water resources have the greatest diversity of beneficial uses and are located in several of the region's hydrologic units. All lakes and reservoirs in the region are designated with Water Contact Recreation (REC-1), reflecting the federal Clean Water Act goals. Water Contact Recreation (REC-1) uses can be restricted or prohibited by the entities that manage these waters.

The largest reservoirs in the North Coast Region (the Central Valley Project's Trinity Lake and the Army Corps of Engineer's Lake Sonoma) export to adjacent hydrologic regions, while Clear Lake Reservoir in Modoc County, supplies water to the United States Bureau of Reclamation (USBR) Klamath Project, which is mainly in Oregon.

2.5.3 Wetlands

Wetlands are waters of the state and are protected under state regulations by provisions of the California Water Code. In addition, some wetlands are protected under the federal Clean Water Act, which was enacted with a goal to restore and maintain the physical, chemical, and biological integrity of the nation's waters, including some wetlands. State Executive Order W-59-93 directed that all state government programs that affect wetlands

shall “ensure no overall net loss and long-term net gain in the quantity, quality and permanence of wetlands acreage and values in California”. On April 2, 2019, and as revised on April 6, 2021, the State Water Board adopted the [State Policy for Water Quality Control: State Wetland Definition and Procedures for Dredge and Fill Material to Waters of the State](https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedure_s.pdf)

(https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedure_s.pdf) that can be found on the [State Water Board's Plans and Policies webpage](https://www.waterboards.ca.gov/plans_policies/) (https://www.waterboards.ca.gov/plans_policies/). This policy established a state definition for wetlands, delineation methodology, a framework for jurisdictional determination and procedure for permitting dredge and fill activities within waters of the state. The Water Boards define wetlands as follows: “An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area’s vegetation is dominated by hydrophytes or the area lacks vegetation.” Federal regulations define wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” (33 CFR § 328.3(c)(1); 40 CFR § 120.2(c)(1).) Both the USEPA and the U.S. Army Corps of Engineers use this definition in administering the Clean Water Act Section 404 discharge permit program.

Federal administrative regulations (33 CFR § 328.3; 40 CFR § 120.2) define some wetlands as a subset of “waters of the United States,” for purposes of the federal Clean Water Act. Waters of the state are defined by the Porter-Cologne Act as “any water, surface or underground, including saline waters, within the boundaries of the State” (CWA § 13050(e)). The definition of waters of the state is broader than the definition of waters of the United States. Under state law and policy, wetlands that meet the above state definition are waters of the state and wetland water quality control is within the jurisdiction of the State and Regional Water Boards independent of federal law, and need not meet federal jurisdictional requirements under the Clean Water Act to trigger state regulatory controls.

Since the Clean Water Act was adopted, various Supreme Court decisions and federal rules have changed the federal interpretation of whether some wetlands are considered federally jurisdictional waters of the U.S. and require permitting under the Clean Water Act for dredge or fill activities. These decisions do not affect the Porter-Cologne (California Water Code) authority of the State and Regional Water Boards to regulate discharges of waste to isolated wetlands or waters of the state.

State and Federal Wetland Policies

The State of California and the federal government adopted separate wetland policies in August 1993 to protect these valuable waters. These policies represented a significant advance in wetland protection. The policies that were developed represent agreements that are sensitive to the needs of landowners and provide flexibility in the permit process. Both policies support the interim goal of no overall net loss and the long-term goal of increasing the quality and quantity of the remaining wetlands.

Wetland Identification, Delineation and Regulation

Regulating development to minimize its effects on existing wetlands is a primary function of several agencies in California. The North Coast Water Board's role in this process is the protection of water quality and the beneficial uses of waters. There are many issues pertinent to wetland regulatory decisions that demonstrate the complexity and controversy that surround regulation and protection of this resource. These include defining what a wetland is, determining its allowable uses, and in some cases determining the appropriate compensatory mitigation, all of which are challenging issues.

The California Coastal Act provides strong enforceable policies for protection of wetlands within California's coastal zone by the California Coastal Commission. These policies are described in the Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone (California Coastal Commission, 1994) and the Procedural Guidance for Evaluating Wetland Mitigation Projects in the California Coastal Zone (California Coastal Commission, 1995).

The North Coast Water Board recognizes that wetlands are frequently referred to under the following names (or classifications): saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, sandflats, unvegetated seasonal ponded areas, vegetated shallows, sloughs, wet meadows, fens, playa lakes, natural ponds, vernal pools, diked baylands, seasonal wetlands, and riparian woodlands. Section III of the State Wetland Procedures³ sets forth the process for wetland area delineation in the North Coast Region. The North Coast Water Board will exercise its independent judgment in determining both the size and functions of the water at issue, and the necessary requirements to protect water quality as a water of the state required by Porter-Cologne.

Constructed Treatment Wetlands

Constructed treatment wetlands are, in most cases, designed, built and managed to provide wastewater or storm water treatment in order to achieve protection or improvement in receiving water quality. These types of wetlands are not constructed to provide mitigation for projects that impact jurisdictional wetlands. These constructed treatment wetlands can also have other benefits including the support of waterfowl and other wildlife, as well as opportunities for education and recreation.

The North Coast Water Board's approach toward regulation of the use of constructed treatment wetlands is to encourage protection of these affiliated uses while appropriate treatment uses are supported.

Beneficial Uses of Wetlands

The North Coast Water Board adopted three additional beneficial uses related to wetlands in 2003 (Resolution No. R1-2003-0052). These beneficial uses: 1) Wetland Habitat (WET), 2) Flood Peak Attenuation/Flood Water Storage (FLD), and 3) Water Quality Enhancement (WQE) are designated for freshwater and saline wetlands in the North

³Full [text of State Wetland Procedures available](https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedure_s.pdf)

(https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedure_s.pdf)

Coast Region (see Table 2-1). The definitions of these beneficial uses can be found within the list of beneficial uses in section 2.2 of this chapter. Many beneficial uses for saline and freshwater wetlands have been designated as potential although some wetlands currently have these uses. When field reconnaissance is conducted as part of a wetland identification process, as described above, the specific beneficial uses of the wetlands will be identified as existing or potential on an individual basis.

2.5.4 Groundwater

Groundwater is defined as subsurface water in soils and geologic formations that are fully saturated all or part of the year.⁴ It includes areas where saturation of the soils and geology fluctuate, including areas of capillary fringe. Groundwater bearing formations sufficiently permeable to transmit and yield significant quantities of water are called aquifers. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers.

Where an aquifer or a number of aquifers underlie a depression that is surrounded or nearly surrounded by hills or mountains, they make up a groundwater basin. Water-bearing geologic units that do not meet the exact definition of an aquifer occur throughout the North Coast Region within groundwater basins. For instance, there are shallow, low permeability zones throughout the region that have extremely low water yields.

Therefore, for basin planning purposes, the term “groundwater” includes all subsurface waters, whether or not these waters meet the classic definition of an aquifer or occur within identified groundwater basins.

Existing and potential beneficial uses applicable to groundwater in the North Coast Region include Municipal and Domestic Water Supply (MUN), reflecting the importance of groundwater as a source of drinking water in the region and as required by the State Water Board's Sources of Drinking Water Policy (See Appendix 7). Other beneficial uses for groundwater include: Industrial Water Supply (IND), Industrial Process Water Supply (PRO), Agricultural Water Supply (AGR), and Freshwater Replenishment to Surface Waters (FRSH), among others. Occasionally, groundwater is used for other purposes (e.g., groundwater pumped for use in aquaculture operations).

⁴ Groundwater does not include subterranean streams, which have the beneficial uses of surface water.

3. WATER QUALITY OBJECTIVES

3.1 Introduction

Water Code section 13241 provides that the Regional Water Quality Control Board (North Coast Water Board) is responsible for establishing water quality objectives which, in the North Coast Water Board's judgment, are necessary for the reasonable protection of the beneficial uses and for the prevention of nuisance.^{5, 6} Establishing water quality objectives involves, first designating beneficial uses; and second selecting the water quality constituents or characteristics and limits or levels necessary to protect those beneficial uses. The beneficial uses of waters in the North Coast Region are described in Chapter 2 and include uses associated with aquatic life, ecological functioning, and human health and welfare. Existing and potential beneficial uses are designated for individual waterbodies in Table 2-1. Programs of implementation for achieving water quality objectives that apply statewide are contained within Chapter 4 and those that apply regionwide are in Chapter 5. Watershed specific water quality attainment strategies including TMDLs are found in Chapter 6.

The North Coast Water Board reviews the Basin Plan, including the water quality standards, every triennial review period to evaluate the need for appropriate modification, as described in Chapter 1. As part of the state's continuing planning process, data is collected and new or revised numeric water quality objectives are developed as sufficient information becomes available for the establishment of such water quality objectives.

3.1.1 Federal and State Law

The federal Clean Water Act (33 U.S.C. § 303) requires the state to submit to the Administrator of the U.S. Environmental Protection Agency (U.S. EPA) for approval all new or revised water quality standards, which are established for surface and ocean waters that are waters of the United States. Water quality standards include designated uses (i.e., beneficial uses), water quality criteria (i.e., water quality objectives), and an antidegradation policy. The beneficial uses in Chapter 2 of this Basin Plan, the water quality objectives contained in this chapter, and the Statement of Policy with Respect to Maintaining High Quality Waters in California, comprise water quality standards for purposes of the federal Clean Water Act.

The Porter-Cologne Water Quality Control Act requires the North Coast Water Board to establish beneficial uses and water quality objectives for waters of the state.⁷ "Water quality objectives" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.⁸ Other water quality objectives

⁵ Wat. Code § 13241

⁶ Wat. Code § 13050(m)

⁷ Waters of the state are any surface water or groundwater, including saline water, within the boundary of the state.

⁸ Wat. Code, § 13050, subd. (h)

[e.g., taste and odor thresholds or other secondary Maximum Contaminant Levels (MCLs)] and policies (e.g., State Water Board Resolution No. 92-49 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304) may apply and may be more stringent. Where more than one water quality objective exists for the same water quality parameter, the water quality objective protective of the most sensitive beneficial use applies. The water quality objectives for ocean waters, inland surface waters, enclosed bays, and estuaries, and groundwaters contained herein are designed to satisfy all state and federal requirements.

The quality of water is defined by the chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water that affect its use.⁹ Water quality objectives can be either narrative objectives or numeric objectives. Narrative objectives provide a general description of water quality that must be attained, and numeric objectives provide a quantitative limitation on pollutant concentrations or levels, to protect beneficial uses of the water body. Both must be attained through pollution control measures, watershed management, restoration and other actions.

Controllable water quality factors shall conform to the water quality objectives contained herein. When other factors result in the degradation of water quality beyond the levels or limits established herein as water quality objectives, then controllable factors shall not cause further degradation of water quality. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the state and that may be reasonably controlled.

3.1.2 Antidegradation Policy

The following policy shall apply to all waters of the North Coast Region, or as described.

Whenever the existing quality of water is better than that established by water quality objectives, such existing water quality shall be maintained unless otherwise provided by the provisions of State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (state Antidegradation Policy), including any revisions thereto.

The State Water Board has interpreted the state Antidegradation Policy to incorporate the federal Antidegradation Policy where the federal policy applies (State Board Order WQO 86-17). The state Antidegradation Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/antidegradation.html) (https://www.waterboards.ca.gov/plans_policies/antidegradation.html).

The federal Antidegradation Policy is found at 40 CFR Section 131.12. Summaries of the state and federal Antidegradation Policies are provided here for the convenience of the reader. These summaries are not intended to augment or modify the state and federal policies.

The state Antidegradation Policy applies more comprehensively to water quality changes than the federal policy. In particular, the state Antidegradation Policy applies to those

⁹ Wat. Code § 13050(g)

groundwaters and surface waters in which the existing water quality meets or exceeds (is better than) water quality objectives. Such groundwaters and surface waters are defined as high quality waters. The state Antidegradation Policy establishes two conditions that must be met before the quality of high quality waters may be lowered by nonpoint or point source waste discharges, whether or not such a discharge is allowed under a new, renewed, or revised permit.

First, the state must determine that lowering the quality of high quality waters:

- 1) Will be consistent with the maximum benefit to the people of the state,
- 2) Will not unreasonably affect present and anticipated beneficial uses of such water, and
- 3) Will not result in water quality less than that prescribed in state policies (e.g., water quality objectives in water quality control plans).

Second, any activities that result in discharges to high quality waters are required to:

- 1) Meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to avoid pollution or nuisance and
- 2) Maintain the highest water quality consistent with the maximum benefit to the people of the state.

If best practicable treatment or control results in a discharge that maintains the existing high water quality, then a less stringent level of treatment or control would not be in compliance with the state Antidegradation Policy.

Likewise, a discharge to high quality water could not be allowed under the state Antidegradation Policy if the discharge, even after treatment or control, would unreasonably affect beneficial uses or would not comply with applicable provisions of water quality control plans.

The federal Antidegradation Policy applies to surface waters, regardless of the level of existing water quality. Where water quality is better than the minimum necessary to support existing or anticipated beneficial uses of surface water, the federal Antidegradation Policy requires that quality to be maintained and protected, unless the state finds, after ensuring public participation, that:

- 1) Such activity is necessary to accommodate important economic or social development in the area in which the waters are located;
- 2) Water quality is adequate to protect existing beneficial uses fully; and,
- 3) The highest statutory and regulatory requirements for all new and existing point source discharges and all cost-effective and reasonable best management practices for nonpoint source control are achieved.

Under the federal Antidegradation Policy, an activity that results in discharge to surface water would be prohibited if the discharge would lower the quality of surface waters that do not currently attain water quality standards. Both the state and federal antidegradation policies acknowledge that an activity that results in a minor water quality lowering, even if incrementally small, can result in a violation of antidegradation policies through

cumulative effects, especially, for example, when the waste discharge contains a cumulative, persistent, or bioaccumulative pollutant or pollutants.

3.2 Water Quality Objectives for Ocean Waters

The provisions of the State Water Board-*Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) and *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) and any revisions thereto shall apply to ocean waters within the North Coast Region. These plans can be found at the [State Water Board website](https://www.waterboards.ca.gov/plans_policies/) (https://www.waterboards.ca.gov/plans_policies/).

3.3 Water Quality Objectives for Inland Surface Waters, Enclosed Bays, and Estuaries

Federal water quality criteria contained in the National Toxics Rule¹⁰ (NTR) and the California Toxics Rule¹¹ (CTR) address human health and aquatic life protection and shall apply to inland surface waters, enclosed bays, and estuaries of the North Coast Region. NTR and CTR water quality criteria are implemented through the provisions of the State Water Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). This policy can be found at the State Water Board website.

In addition to, the Antidegradation Policy, the waterbody-specific water quality objectives contained in Tables 3-1, 3-1a, and 3-1b, and the following water quality objectives shall apply to inland surface waters, enclosed bays, and estuaries of the North Coast Region. The water quality objectives are presented below alphabetically. For statewide water quality objectives established by the State Water Board, the below subsections include a summary of the water quality objectives along with links that include the entirety of the applicable provisions.

3.3.1 Bacteria

3.3.1.1 North Coast Narrative Bacteria Objective

The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

3.3.1.2 SHELL

At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43/100 mL for a 5-tube decimal dilution test or 49/100 mL when a three-tube decimal dilution test is used (National Shellfish Sanitation Program, Manual of Operation).

3.3.1.3 REC-1

The State Water Board established two bacteria water quality objectives applicable to

¹⁰ 40 C.F.R. § 131.36.

¹¹ 40 C.F.R. § 131.38.

waters with the REC-1 beneficial use, depending on the salinity level, and an implementation plan in Part 3 of the Water Quality Control Plan for Inland Surface Water, Enclosed Bays, and Estuaries of California – Bacteria Provisions and a Water Quality Standards Variance Policy, State Water Board Resolution 2018-0038 (Statewide Bacteria Provisions). The Statewide Bacteria Provisions apply to the North Coast Region. This section provides a summary of the water quality objectives in the Statewide Bacteria Provisions. The full text of the Statewide Bacteria Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/bacterialobjectives/) (<https://www.waterboards.ca.gov/bacterialobjectives/>).

The water quality objectives are summarized as follows:

For all waters where the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time during the calendar year, the bacteria objective is:

A six-week rolling geometric mean of *Escherichia coli* (*E. coli*) not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly and a statistical threshold value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

For all waters where the salinity is greater than 1 ppt more than 5 percent of the time during the calendar year, the bacteria objective is:

A six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL calculated weekly, with an STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

Applicable Waters	Objective Elements/Indicators	GM (cfu/100mL) ¹²	STV (cfu/100 mL) ¹³
All waters where salinity is equal to or less than 1 ppt 95 percent or more of the time	<i>E. coli</i>	100	320
All waters where salinity is greater than 1 ppt more than 5 percent of the time	Enterococcus	30	110

¹² GM = geometric mean, a six-week rolling geometric mean calculated weekly

¹³ STV = statistical threshold value, not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner

3.3.2 Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

3.3.3 Chemical Constituents

Waters shall not contain concentrations of chemical constituents in amounts that cause nuisance or adversely affect beneficial uses.

In no case shall waters designated for use as domestic or municipal supply (MUN) contain concentrations of chemical constituents in excess of the following maximum contaminant level (MCL) and secondary maximum contaminant level (SMCL) provisions specified in title 22 of the California Code of Regulations:

- a) Table 64431-A, MCLs - Inorganic Chemicals (§ 64431)
- b) Table 64444-A, MCLs - Organic Chemicals (§ 64444)
- c) Table 64449-A, SMCLs - "Consumer Acceptance Contaminant Levels" (§ 64449)
- d) Table 64449-B, SMCLs - "Consumer Acceptance Contaminant Level Ranges" (§ 64449)
- e) Table 64442, Radionuclide Maximum Containment Levels and Detection Levels for Purposes of Reporting (DLRs) (§ 64442)
- f) Table 64443, Radionuclide Maximum Contaminant Levels and
- g) DLRs (§ 64443)

These provisions are incorporated by reference into this Basin Plan. This incorporation by reference is prospective, including future changes to the incorporated provisions as the changes take effect.

Numeric water quality objectives for individual waterbodies are contained in Table 3-1, 3-1a, and 3-1b.

3.3.4 Color

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

3.3.5 Dissolved Oxygen

Dissolved oxygen concentrations shall conform to the following aquatic life requirements or as specified.

Beneficial Use	Daily Minimum Objective (mg/L)	7-Day Moving Average Objective (mg/L)¹⁴
Marine Habitat (MAR) Inland Saline Water Habitat (SAL)	5.0	NA
Warm Freshwater Habitat (WARM)	5.0	6.0
Cold Freshwater Habitat (COLD) ¹⁵	6.0	8.0
Spawning, Reproduction, and/or Early Development (SPWN) ¹⁶	9.0	11.0

Dissolved oxygen concentrations in Humboldt Bay and Bodega Bay shall conform to a daily minimum objective of 6.0 mg/L. As required by the Ocean Plan, dissolved oxygen concentrations in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally in ocean waters.

Upon approval from the Executive Officer, in those waterbodies for which the aquatic life-based dissolved oxygen requirements are unachievable due to natural conditions¹⁷, site specific background dissolved oxygen requirements can be applied as water quality objectives by calculating the daily minimum dissolved oxygen necessary to maintain 85% dissolved oxygen saturation during the dry season and 90% dissolved oxygen saturation during the wet season under site salinity, site atmospheric pressure, and natural receiving water temperatures.¹⁸ In no event may controllable factors reduce the daily minimum dissolved oxygen below 6.0 mg/L.

¹⁴ A 7-day moving average is calculated by taking the average of each set of seven consecutive daily averages.

¹⁵ Water quality objectives designed to protect COLD-designated waters are based on the aquatic life-based requirements of salmonids but apply to all waters designated in Table 2-1 of the Basin Plan as COLD regardless of the presence or absence of salmonids.

¹⁶ Water quality objectives designed to protect SPWN-designated waters apply to all fresh waters designated in Table 2-1 of the Basin Plan as SPWN in those reaches and during those periods of time when spawning, egg incubation, and larval development are occurring or have historically occurred. The period of spawning, egg incubation, and emergence generally occur in the North Coast Region between the dates of September 15 and June 4.

¹⁷ Natural conditions are conditions or circumstances affecting the physical, chemical, or biological integrity of water that are not influenced by past or present anthropogenic activities.

¹⁸ The method(s) used to estimate natural temperatures for a given waterbody or stream length must be approved by the Executive Officer and may include, as

For the protection of estuarine habitat (EST), the dissolved oxygen concentration of enclosed bays and estuaries shall not be depressed to levels adversely affecting beneficial uses as a result of controllable water quality factors.

Dissolved oxygen concentrations for the Klamath River Watershed shall conform to the waterbody-specific objectives listed in Table 3-1a.

3.3.6 Floating Material

Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

3.3.7 Mercury

The State Water Board established mercury water quality objectives for the reasonable protection of people and wildlife consuming fish in Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California-Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions, State Water Board Resolution 2017-0027 (Statewide Mercury Provisions). The Statewide Mercury Provisions apply to the North Coast Region. The Statewide Mercury Provisions include applicability, mercury water quality objectives, and implementation plans. This section provides a summary of the applicability and water quality objectives in the Statewide Mercury Provisions. The full text of the Statewide Mercury Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/mercury/docs/hg_prov_final.pdf)

(https://www.waterboards.ca.gov/water_issues/programs/mercury/docs/hg_prov_final.pdf)

Applicability:

The water quality objectives that protect people who consume fish apply to, but may not be limited to, waters with the COMM, CUL, T-SUB, and SUB/FISH¹⁹ beneficial uses. The water quality objectives that protect wildlife that consume fish apply to, but may not be limited to, waters with WILD, MAR, RARE, WARM, COLD, EST, and SAL beneficial uses.

Mercury Water Quality Objectives:

The Statewide Mercury Provisions contain five mercury fish tissue water quality objectives, which are formulated for one or more of the applicable beneficial uses, depending on the consumption pattern (which includes consumption rate, fish size, and species) by individuals and wildlife²⁰. Additionally, different sizes and species of fish contained in a water body will, in some cases, affect whether a particular water quality objective may be utilized to evaluate whether one or more beneficial uses are supported. Therefore, the fish in a particular water body would dictate which water quality objective(s) must be evaluated to ensure all the applicable wildlife beneficial uses are supported, as

appropriate, comparison with reference streams, simple calculation, or computer models.

¹⁹ The water quality objective applicable to the SUB beneficial use applies to the Subsistence Fishing (FISH) beneficial use contained in chapter 2 of this Basin Plan.

²⁰ The California Least Tern Prey Fish Water Quality Objective that is in the Mercury Provisions is not currently applicable to any waters in the North Coast Region.

discussed and illustrated in the flow chart in Attachment B of the Statewide Mercury Provisions. For any of the mercury fish tissue water quality objectives, measurements of total mercury concentrations in fish tissue may be substituted for methylmercury concentrations in fish tissue.

- Sport Fish Water Quality Objective
 - The average methylmercury concentrations shall not exceed 0.2 milligrams per kilogram (mg/kg) fish tissue within a Calendar Year²¹
 - The water quality objective applies to the wet weight concentration in skinless fillet in trophic level 3 or trophic level 4 fish, whichever is the highest trophic level fish in the water body.
 - Freshwater trophic level 3 fish are between 150 to 500 millimeters (mm) in total length and trophic level 4 fish are between 200 to 500 mm in total length, except for sizes specified in Attachment C of the Statewide Mercury Provisions, or as additionally limited in size in accordance with the legal size limit for the species caught. Estuarine fish shall be within the legal size limit and greater than 150 mm, or as otherwise specified in Attachment C of the Statewide Mercury Provisions.
- Tribal Subsistence Fishing Water Quality Objective²²
 - The average methylmercury concentrations shall not exceed 0.04 mg/kg fish tissue within a calendar year. The water quality objective applies to the wet weight concentration in skinless fillet from a mixture of 70 percent trophic level 3 fish and 30 percent trophic level 4 fish as detailed in Attachment C of the Statewide Mercury Provisions.
- Subsistence Fishing Water Quality Objective
 - Waters with the Subsistence Fishing (FISH) beneficial use shall be maintained free of mercury at concentrations which accumulate in fish and cause adverse biological, reproductive, or neurological effects in people.
 - The fish consumption rate used to evaluate this water quality objective shall be derived from water body- and population-specific data and information on the subsistence fishers' rate and form (e.g. whole, fillet with skin, skinless fillet) of fish consumption.²³

²¹ The Statewide Mercury Provisions define calendar year to mean a fixed period of twelve calendar months.

²² Chapter 2 of this Basin Plan does not currently contain the CUL, T-SUB, or SUB beneficial uses as defined by the State Water Board. In the future, if the North Coast Water Board amends its Basin Plan with the Provisions' beneficial uses for CUL, T-SUB, and SUB, such designation would determine which of the Mercury Water Quality Objectives would apply.

²³ U.S. EPA recommended national subsistence fishing consumption rate of 142 grams per day (4 to 5 meals per week) shall be used to translate the narrative objective unless a site-specific numeric water quality objective is developed or an external peer-reviewed consumption study uses a different methodology to translate the narrative water quality objective.

- When a water quality control plan designates a water body or water body segment with the Subsistence Fishing (FISH) beneficial use, development of a region-wide or site-specific numeric fish tissue mercury water quality objective is recommended to account for the wide variation of consumption rate and fish species encompassed by the FISH beneficial use.
- Prey Fish Water Quality Objective
 - The average methylmercury concentrations shall not exceed 0.05 mg/kg in Wet Weight whole fish tissue of any species between 50 to 150 mm in total length during the breeding season. The breeding season is February 1 through July 31, unless site-specific information indicates another appropriate breeding period.

3.3.8 Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water that cause nuisance, or that otherwise adversely affect beneficial uses.

3.3.9 Pesticides

Waters shall not contain any individual pesticide or combination of pesticides in concentrations that cause nuisance or adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations in bottom sediments or aquatic life that cause nuisance or adversely affect beneficial uses.

In no case shall waters designated for use as domestic or municipal supply (MUN) contain concentrations of pesticides in excess of the numeric limits established in title 22 and as prospectively incorporated in 3.4.3 Chemical Constituents.

3.3.10 pH

The pH shall conform to those limits listed in Table 3-1. For waters not listed in Table 3-1 and where pH objectives are not prescribed, the pH 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 MAR or SAL beneficial uses nor 0.5 units within the range specified above in fresh waters with COLD or WARM beneficial uses.

3.3.11 Radioactivity

Waters shall not contain radionuclides in concentrations that are deleterious to human, plant, animal, or aquatic life nor result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or indigenous aquatic life.

In no case shall waters designated for use as MUN contain concentrations of radionuclides in excess of the numeric limits established in title 22 and as prospectively incorporated in 3.4.3 Chemical Constituents.

3.3.12 Sediment

The suspended sediment load and suspended sediment discharge rate to surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

3.3.13 Settleable Material

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

3.3.14 Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

3.3.15 Tastes and Odors

Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses.

In no case shall waters designated for use as MUN contain concentrations of chemicals in excess of the numeric taste and odor limits established in title 22 and as prospectively incorporated in 3.4.3 Chemical Constituents.

3.3.16 Temperature

Temperature objectives for interstate waters associated with COLD, WARM, enclosed bays, and estuaries are as specified in the State Water Board Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California (Thermal Plan) including any revisions thereto. The Thermal Plan is available at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/docs/2023/thermpln.pdf):

(https://www.waterboards.ca.gov/plans_policies/docs/2023/thermpln.pdf).

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 North Coast Water Board that such alteration in temperature does not adversely affect beneficial uses.

At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.

At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Waterbody-specific objectives for temperature in the Upper Trinity River are listed in Table 3-1b.

3.3.17 Toxicity

3.3.17.1 North Coast Regional Narrative Toxicity Objective

Waters shall not contain toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the synergistic effect of multiple substances. Compliance with this objective shall 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 North Coast Water Board.

In addition, effluent limits based upon bioassays of effluents will be prescribed, where appropriate. Additional numeric receiving water quality objectives for specific toxicants will be established as sufficient data become available and source control of toxic substances may be required.

3.3.17.2 Aquatic Toxicity Water Quality Objectives

The State Water Board, in its State Policy for Water Quality Control: Toxicity Provisions, Resolution 2020-0044 (Toxicity Provisions), established requirements for water quality that apply to all inland surface waters, enclosed bays, and estuaries and coastal lagoons of the state, including both waters of the United States and surface waters of the state. The Toxicity Provisions apply in the North Coast Region.

The Toxicity Provisions include applicability, water quality objectives, and implementation plans. This section provides a summary of the Statewide Toxicity Provisions. The full text of the Statewide Toxicity Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/2021/2021-state-policy-toxicity-provisions.pdf) (https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/2021/2021-state-policy-toxicity-provisions.pdf).

3.3.17.2.1 Numeric Chronic Aquatic Toxicity Objective

The chronic aquatic toxicity water quality objective is expressed as a null hypothesis and an alternative hypothesis with a regulatory management decision (RMD) of 0.75, where the following null hypothesis shall be used:

$$H_0: \text{Mean response (ambient water)} \leq 0.75 \cdot \text{mean response (control)}$$

In general terms, the null hypothesis is the following statement: the ambient water is toxic because the response (e.g., survival, reproduction, growth) of the test organisms in the ambient water sample is less than or equal to 75 percent of the test organisms' response in the control water sample.

And where the following alternative hypothesis shall be used:

H_a : Mean response (ambient water) > 0.75 • mean response (control)

In general terms, the alternative hypothesis is the following statement: the ambient water is not toxic because the response (e.g., survival, reproduction, growth) of the test organisms in the ambient water sample is greater than 75 percent of the test organisms' response in the control water sample.

Attainment of the water quality objective is demonstrated by conducting chronic aquatic toxicity testing as described in section iii.b.2 and rejecting this null hypothesis in accordance with the test of significant toxicity (tst) statistical approach described in section iii.b.3. When the null hypothesis is rejected, the alternative hypothesis is accepted in its place, and there is no exceedance of the chronic aquatic toxicity water quality objective. failing to reject the null hypothesis (referred to as a "fail") is equivalent to an exceedance of the chronic aquatic toxicity water quality objective.

3.3.17.2.2 Numeric Acute Aquatic Toxicity Objective

The acute aquatic toxicity water quality objective is expressed as a null hypothesis and alternative hypothesis with an RMD of 0.80, where the following null hypothesis shall be used:

H_0 : Mean response (ambient water) \leq 0.80 • mean response (control)

In general terms, the null hypothesis is the following statement: the ambient water is toxic because the response (e.g., survival) of the test organisms in the ambient water sample is less than or equal to 80 percent of the test organisms' response in the control water sample.

And where the following alternative hypothesis shall be used:

H_a : Mean response (ambient water) > 0.80 • mean response (control)

In general terms, the alternative hypothesis is the following statement: the ambient water is not toxic because the response (e.g., survival) of the test organisms in the ambient water sample is greater than 80 percent of the test organisms' response in the control water sample.

Attainment of the water quality objective is demonstrated by conducting acute aquatic toxicity testing as described in Section III.B.2 and rejecting this null hypothesis in accordance with the TST statistical approach described in Section III.B.3. When the null hypothesis is rejected, the alternative hypothesis is accepted in its place, and there is no

exceedance of the acute aquatic toxicity water quality objective. Failing to reject the null hypothesis (referred to as a “fail”) is equivalent to an exceedance of the acute aquatic toxicity water quality objective.

3.3.18 Trash

The State Water Board, in Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries in California, Resolution 2020-0044 (Trash Provisions), established a narrative water quality objective applicable to both waters of the United States and surface waters of the state. The Trash Provisions apply in the North Coast Region.

The Trash Provisions include applicability, prohibitions, and implementation requirements. This section provides a summary of the water quality objective in the Trash Provisions. The full text of the Trash Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/trash_control/docs/trash_appendix_e_121615.pdf) (https://www.waterboards.ca.gov/water_issues/programs/trash_control/docs/trash_appendix_e_121615.pdf).

The water quality objective is summarized as follows:

Trash shall not be present in inland surface waters, enclosed bays, estuaries, and along shorelines or adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.

3.3.19 Turbidity

Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

3.4 Water Quality Objectives for Groundwaters²⁴

The following objectives shall apply to groundwaters of the North Coast Region. Waterbody-specific objectives contained in Table 3-1 also apply.

3.4.1 Bacteria

In groundwaters used for domestic or municipal supply (MUN), the median of the most probable number of coliform organisms over any 7-day period shall be less than 1.1 MPN/100 ml, less than 1 colony/100 ml, or absent (State Department of Health Services).

²⁴Groundwater is defined as subsurface water in soils and geologic formations that are fully saturated all or part of the year. Groundwater is any subsurface body of water which is beneficially used or usable; and includes perched water if such water is used or usable or is hydraulically continuous with used or usable water.

3.4.2 Chemical Constituents

Groundwaters shall not contain concentrations of chemical constituents in amounts that cause nuisance or adversely affect beneficial uses.

In no case shall groundwaters designated for use as MUN contain concentrations of chemical constituents in excess of the following MCL and SMCL provisions specified in Title 22 of the California Code of Regulations:

- a) Table 64431-A, MCLs - Inorganic Chemicals (§ 64431)
- b) Table 64444-A, MCLs - Organic Chemicals (§ 64444)
- c) Table 64449-A, SMCLs - "Consumer Acceptance Contaminant Levels" (§ 64449)
- d) Table 64449-B, SMCLs - "Consumer Acceptance Contaminant Level Ranges" (§ 64449)
- e) Table 64442, Radionuclide MCLs and Detection Levels for Purposes of Reporting (DLRs) (§ 64442)
- f) Table 64443, Radionuclide MCLs and
- g) DLRs (§ 64443)

These provisions are incorporated by reference into this Basin Plan. This incorporation by reference is prospective, including future changes to the incorporated provisions as the changes take effect.

Waterbody-specific numeric objectives for individual groundwaters are contained in Table 3-1.

3.4.3 Radioactivity

Groundwaters shall not contain concentrations of radionuclides in concentrations that cause nuisance or adversely affect beneficial uses.

In no case shall waters designated for use as MUN contain concentrations of radionuclides in excess of the numeric limits established in Title 22 and as prospectively incorporated in 3.5.2 Chemical Constituents.

3.4.4 Tastes and Odors

Groundwaters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

In no case shall waters designated for use as MUN contain concentrations of chemicals in excess of the numeric taste and odor limits established in Title 22 and as prospectively incorporated in 3.5.2 Chemical Constituents.

3.4.5 Toxicity

Groundwaters shall not contain toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, humans or that adversely affects

beneficial uses. This objective applies regardless of whether the toxicity is caused by a single substance or the synergistic effect of multiple substances.

3.5 Compliance with Water Quality Objectives

The primary ways in which the North Coast Water Board implements water quality objectives is through permits, orders, and other actions for specific and general categories of discharges and potential discharges, and associated controllable water quality factors. These permits, orders, and other actions include, but are not limited to waste discharge requirements (including provisions required by federal law), waivers of waste discharge requirements, total maximum daily loads, water quality certifications, waste discharge prohibitions, and cleanup orders. Water quality objectives are also implemented by other state and federal agencies in some circumstances.

Water quality objectives must be implemented in accordance with the applicable laws governing the regulated activity. Compliance with applicable water quality objectives is achieved through implementation of individual or general permits, orders and other regulatory actions in accordance with statute, regulation, and actions plans contained in Chapters 4 through 6. It is not feasible to predetermine the circumstances and conditions that could be created by all discharges. Also, it is not practical to specify how water quality objectives are implemented as appropriate for all conditions which could be created by discharges and other controllable water quality factors.

The North Coast Water Board recognizes that immediate compliance with new effluent and/or receiving water limitations or cleanup levels based on new, revised or newly interpreted water quality objectives or prohibitions adopted by the North Coast Water Board or the State Water Board, or with new, revised or newly interpreted water quality criteria promulgated by the U.S. EPA²⁵, may not be technically or economically feasible in all circumstances. Therefore, it is within the discretion of the North Coast Water Board to establish the terms of compliance with applicable water quality objectives and the Antidegradation Policy within individual or general permits, orders and other regulatory actions, by evaluating site-specific characteristics or constraints and establishing schedules of compliance.²⁶ Any schedule of compliance shall require attainment of water quality objectives within the shortest feasible period of time. The issuance of an NPDES permit containing a compliance schedule will be in accordance with the State Water Board *Policy for Compliance Schedules in NPDES Permits*.²⁷

²⁵ New, revised, or newly interpreted water quality objectives, criteria, or prohibitions means: 1) objectives as defined in Section 13050(h) of Porter-Cologne; 2) criteria as promulgated by the U.S. EPA; or 3) prohibitions as defined in the Water Quality Control Plan for the North Coast Region that are adopted, revised, or newly interpreted after November 29, 2006. Objectives and criteria may be narrative or numeric.

²⁶ Wat. Code § 13300

²⁷ State Water Board Resolution No. 2008-0025.

3.5.1 Discharge Limitations and Cleanup Levels

The North Coast Water Board, in setting waste discharge requirements, will consider, among other things, the potential impact on beneficial uses within the area of influence of the discharge, the appropriate water quality objectives, the existing quality of receiving waters, and the Antidegradation Policy. The North Coast Water Board will make a finding as to the beneficial uses to be protected and establish requirements to protect those uses, to meet water quality objectives and the Antidegradation Policy.

In setting discharge limitations and cleanup levels, the North Coast Water Board need not authorize the utilization of the full waste assimilation capacities of the receiving waters.²⁸ Therefore, in some cases, with appropriate considerations and findings, the North Coast Water Board may adopt discharge limitations and cleanup levels that are more stringent in order preserve high quality waters and to fully protect the existing and potential beneficial uses.

For NPDES permits, discharge limitations are developed in accordance with the provisions of the State Water Board's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP). Cleanup levels are developed in conformance with State Water Board Resolution No. 92-49 *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*, which sets natural background as the presumptive cleanup level.

When it is necessary to derive numeric values in order to develop discharge limitations and cleanup levels that implement narrative water quality objectives, or to evaluate compliance with narrative water quality objectives, the North Coast Water Board may consider all relevant and scientifically valid evidence. Generally, numeric values are derived from validated site-specific data, scientific peer-reviewed literature, and numeric values established in other state or federal laws, regulations, plans, policies, or guidelines, or developed and published by other governmental or non-governmental agencies and organizations.

Established governmental and non-governmental agencies and organizations include, but are not limited to: California State Water Resources Control Board, California Department of Public Health, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Wildlife, U.S. Environmental Protection Agency, U.S. Food and Drug Administration, National Science Foundation, National Academy of Sciences, U.S. Fish and Wildlife Service, the Food and Agricultural Organization of the United Nations and the World Health Organization. The State Water Board has compiled numeric chemical constituent and toxicant values from the literature for over 860 chemical constituents in a document entitled *A Compilation of Water Quality Goals*. A searchable *Water Quality Goals* database is accessible on the State Water Board website. The North Coast Water Board has compiled sediment thresholds from the literature for sediment-related indices and published them in a peer-reviewed report entitled *Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices* (July 2006). This document can be found on the North Coast Water Board website. On a

²⁸ Wat. Code § 13263 (b)

case by case basis, the North Coast Water Board may collect or require that a discharger collect site-specific data or conduct site-specific water quality assessments or studies for the purpose of supporting the development of appropriate discharge limitations or cleanup levels, which translate the applicable narrative water quality objective for unique site conditions.

**TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹**

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
Lost River HA									
Clear Lake Reservoir & Upper Lost River	300	200			9.0	7.0	60	0.5	0.1
Lower Lost River	1000	700			9.0	7.0	-	0.5	0.1
Other Streams	250	150			8.4	7.0	50	0.2	0.1
Tule Lake	1300	900			9.0	7.0	400	-	-
Lower Klamath Lake	1150	850			9.0	7.0	400	-	-
Groundwaters ³³	1100	500			8.5	7.0	250	0.3	0.2
Butte Valley HA									
Streams	150	100			8.5	7.0	30	0.1	0.0
Meiss Lake	2000	1300			9.0	7.5	100	0.3	0.1
Groundwaters ²⁹	800	400			8.5	6.5	120	0.2	0.1

²⁹ Values of – indicate there is no waterbody specific objective available.

³⁰ Waterbodies are grouped by hydrologic unit (HU), hydrologic area (HA), or hydrologic subarea (HSA).

³¹ 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

³² 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

³³ Value may vary depending on the aquifer being sampled. This value is the result of sampling over time, and as pumped, from more than one aquifer.

TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
Shasta Valley HA									
Shasta River	800	600			8.5	7.0	220	1.0	0.5
Other Streams	700	400			8.5	7.0	200	0.5	0.1
Lake Shastina	300	250			8.5	7.0	120	0.4	0.2
Groundwaters ²⁹	800	500			8.5	7.0	180	1.0	0.3
Scott River HA									
Scott River	350	250			8.5	7.0	100	0.4	0.1
Other Streams	400	275			8.5	7.0	120	0.2	0.1
Groundwaters ²⁹	500	250			8.0	7.0	120	0.1	0.1
Salmon River HA									
All Streams	150	125			8.5	7.0	60	0.1	0.0
Middle Klamath River HA									
Klamath River above Iron Gate Dam including Iron Gate & Copco Reservoirs ³⁴	425	275			8.5	7.0	60	0.3	0.2
Klamath River below Iron Gate Dam ³⁰									
Other Streams	300	150			8.5	7.0	60	0.1	0.0
Groundwaters ²⁹	750	600			8.5	7.5	200	0.3	0.1

³⁴ The Waterbody Specific Objectives for dissolved oxygen have been recalculated for the mainstem Klamath River and are presented separately in Table 3-1a.

CHAPTER 3. WATER QUALITY OBJECTIVES

TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
Applegate River HA									
All Streams	250	175			8.5	7.0	60	-	-
Upper Trinity River HA									
Trinity River	200	175			8.5	7.0	80	0.1	0.0
Other Streams	200	150			8.5	7.0	60	0.0	0.0
Trinity Lake & Lewiston Reservoir	200	150			8.5	7.0	60	0.0	0.0
Hayfork Creek									
Hayfork Creek	400	275			8.5	7.0	150	0.2	0.1
Other Streams	300	250			8.5	7.0	125	0.0	0.0
Ewing Reservoir	250	200			8.0	6.5	150	0.1	0.0
Groundwaters ²⁹	350	225			8.5	7.0	100	0.2	0.1
S.F. Trinity River HA									
S.F. Trinity River	275	200			8.5	7.0	100	0.2	0.0
Other Streams	250	175			8.5	7.0	100	0.0	0.0
Lower Trinity River HA									
Trinity River	275	200			8.5	7.0	100	0.2	0.0
Other Streams	250	200			8.5	7.0	100	0.1	0.0
Groundwaters ²⁹	200	150			8.5	7.0	75	0.1	0.1
Lower Klamath River HA									

TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
Klamath River ³⁰	300 ³⁵	200 ³¹			8.5	7.0	75 ³¹	0.5 ³¹	0.2 ³¹
Other Streams	200 ³¹	125 ³¹			8.5	6.5	25 ³¹	0.1 ³¹	0.0 ³¹
Groundwaters ²⁹	300	225			8.5	6.5	100	0.1	0.0
Illinois River HA									
All Streams	200	125			8.5	7.0	75	0.1	0.0
Winchuck River HU									
All Streams	200 ³¹	125 ³¹			8.5	7.0	50 ³¹	0.0 ³¹	0.0 ³¹
Smith River HU									
Smith River-Main Forks	200	125			8.5	7.0	60	0.1	0.1
Other Streams	150 ³¹	125 ³¹			8.5	7.0	60 ³¹	0.1 ³¹	0.0 ³¹
Smith River Plain HSA									
Smith River	200 ³¹	150 ³¹			8.5	7.0	60 ³¹	0.1 ³¹	0.0 ³¹
Other Streams	150 ³¹	125 ³¹			8.5	6.5	60 ³¹	0.1 ³¹	0.0 ³¹
Lakes Earl & Talawa	-	-			8.5	6.5	-	-	-
Groundwaters ²⁹	350	100			8.5	6.5	75	1.0	0.0
Redwood Creek HU									
Redwood Creek	220 ³¹	125 ³¹	115 ³¹	75 ³¹	8.5	6.5			
Mad River HU									
Mad River	300 ³¹	150 ³¹	160 ³¹	90 ³¹	8.5	6.5			
Eureka Plain HU									

³⁵ Does not apply to estuarine areas.

TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
Humboldt Bay	-	-	-	-	8.5	Footnote ³⁶			
Eel River HU									
Eel River	375 ³¹	225 ³¹	275 ³¹	140 ³¹	8.5	6.5			
Van Duzen River	375	175	200	100	8.5	6.5			
South Fork Eel River	350	200	200	120	8.5	6.5			
Middle Fork Eel River	450	200	230	130	8.5	6.5			
Outlet Creek	400	200	230	125	8.5	6.5			
Cape Mendocino HU									
Bear River	390 ³¹	255 ³¹	240 ³¹	150 ³¹	8.5	6.5			
Mattole River	300 ⁵	170 ⁵	170 ⁵	105 ⁵	8.5	6.5			
Mendocino Coast HU									
Ten Mile River	-	-	-	-	8.5	6.5			
Noyo River	185 ³¹	150 ³¹	120 ³¹	105 ³¹	8.5	6.5			
Jug Handle Creek	-	-	-	-	8.5	6.5			
Big River	300 ³¹	195 ³¹	190 ³¹	130 ³¹	8.5	6.5			
Albion River	-	-	-	-	8.5	6.5			
Navarro River	285 ³¹	250 ³¹	170 ³¹	150 ³¹	8.5	6.5			
Garcia River	-	-	-	-	8.5	6.5			
Gualala River	-	-	-	-	8.5	6.5			
Russian River HU									

³⁶ pH shall not be depressed below natural background levels.

TABLE 3-1
SPECIFIC WATER QUALITY OBJECTIVES FOR THE NORTH COAST REGION²⁹

Waterbody ³⁰	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/L)		Hydrogen Ion (pH)		Hardness (mg/L)	Boron (mg/L)	
	90% Upper Limit ³¹	50% Upper Limit ³²	90% Upper Limit ²⁷	50% Upper Limit ²⁸	Max	Min	50% Upper Limit ²⁸	90% Upper Limit ²⁷	50% Upper Limit ²⁸
(upstream) ³⁷	320	250	170	150	8.5	6.5			
(downstream) ³⁸	375 ³¹	285 ³¹	200 ³¹	170 ³¹	8.5	6.5			
Laguna de Santa Rosa	-	-	-	-	8.5	6.5			
Bodega Bay	-	-	-	-	8.5	Footnote ³²			
Coastal Waters ³⁹	-	-	-	-	Footnote ⁴⁰	Footnote ³⁶			

³⁷ Russian River (upstream) refers to the mainstem river upstream of its confluence with Laguna de Santa Rosa.

³⁸ Russian River (downstream) refers to the mainstem river downstream of its confluence with Laguna de Santa Rosa.

³⁹ The State Water Board Ocean Plan applies to all North Coast Region coastal waters.

⁴⁰ pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

TABLE 3-1a⁴¹ WATERBODY-SPECIFIC OBJECTIVES FOR DISSOLVED OXYGEN IN THE MAINSTEM KLAMATH RIVER		
Location⁴²	Percent DO Saturation Based On Natural Receiving Water Temperatures⁴³	Time Period
Stateline to the Scott River	85%	April 1 through September 30
	90%	October 1 through March 31
Scott River to Upstream Hoopa- California boundary	90%	Year round
Downstream Hoopa-California boundary to Turwar	85%	June 1 through August 31
	90%	September 1 through May 31
	80%	August 1 through August 31

⁴¹ States may establish waterbody- specific objectives equal to natural background (USEPA, 1986. Ambient Water Quality Criteria for Dissolved Oxygen, EPA 440/5-86-033; USEPA Memo from Tudor T. Davies, Director of Office of Science and Technology, USEPA Washington, D.C. dated November 5, 1997). For aquatic life uses, where the natural background condition for a specific parameter is documented, by definition that condition is sufficient to support the level of aquatic life expected to occur naturally at the site absent any interference by humans (Davies, 1997). These dissolved oxygen objectives are derived from the T1BSR run of the Klamath TMDL model and described in Tetra Tech, December 23, 2009 Modeling Scenarios: Klamath River Model for TMDL Development. They represent natural dissolved oxygen background conditions due only to non-anthropogenic sources and a natural flow regime.

⁴² These objectives apply to the maximum extent allowed by law. To the extent that the state lacks jurisdiction, the reach Specific Dissolved Oxygen Objectives for the Mainstem Klamath River are extended as a recommendation to the applicable regulatory authority.

⁴³ Corresponding dissolved oxygen concentrations are calculated as daily minima, based on waterbody- specific barometric pressure, water-specific salinity, and natural receiving water temperatures as estimated by the T1BSR run of the Klamath TMDL model and described in Tetra Tech, December 23, 2009. Modeling Scenarios: Klamath River Model for TMDL Development. The estimates of natural receiving water temperatures used in these calculations may be updated as new data or method(s) become available. After opportunity for public comment, any update or improvements to the estimate of natural receiving water temperature must be reviewed and approved by Executive Officer before being used for this purpose.

TABLE 3-1a⁴¹ WATERBODY-SPECIFIC OBJECTIVES FOR DISSOLVED OXYGEN IN THE MAINSTEM KLAMATH RIVER		
Location⁴²	Percent DO Saturation Based On Natural Receiving Water Temperatures⁴³	Time Period
Upper and Middle Estuary	85%	September 1 through October 31 and June 1 through July 31
	90%	November 1 through May 31
Lower Estuary	For the protection of estuarine habitat (EST), the dissolved oxygen content of the lower estuary shall not be depressed to levels adversely affecting beneficial uses as a result of controllable water quality factors.	

TABLE 3-1b WATERBODY-SPECIFIC OBJECTIVES FOR TEMPERATURE IN THE UPPER TRINITY RIVER		
Location/River Reach	Daily Average Not to Exceed	Time Period
Lewiston Dam to Douglas City Bridge	60°F	July 1 – September 14
	56°F	September 15 – October 1
Lewiston Dam to confluence of North Fork Trinity River	56°F	October 1 - December 31

4. STATEWIDE IMPLEMENTATION, PROHIBITIONS, PLANS, AND POLICIES

The State Water Board has adopted a number of plans and policies for statewide water quality management. The North Coast Water Board is required to implement the provisions of several State Water Board statewide plans and policies. This section of the Basin Plan includes summaries of important State Water Board plans and policies relevant to the North Coast Region. More information about State Water Board plans and policies, including the complete text, can be found on the [State Water Board's Plans and Policies website](https://www.waterboards.ca.gov/plans_policies) (https://www.waterboards.ca.gov/plans_policies).

4.1 Antidegradation Policy

Whenever the existing quality of water is better than that established by water quality objectives, such existing water quality shall be maintained unless otherwise provided by the provisions of State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (state Antidegradation Policy), including any revisions thereto. The state Antidegradation Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/antidegradation.html) (https://www.waterboards.ca.gov/plans_policies/antidegradation.html). The federal Antidegradation Policy is found at 40 CFR Section 131.12. Summaries of the state and federal Antidegradation Policies are provided in Chapter 3.

4.2 Areas of Special Biological Significance and State Water Quality Protection Areas

In 1974, the State Water Board adopted Resolution 74-28, Designating Areas of Special Biological Significance and Authorizing Notification of the Regional Water Quality Control Boards and the Environmental Protection Agency. The full text of Resolution 74-28 can be found on the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1974/rs74_028.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1974/rs74_028.pdf). Resolution 74-28 required Regional Water Boards to select areas in coastal waters which contain “biological communities of such extraordinary, even though unquantifiable, value that no acceptable risk of change in their environments as a result of man’s activities can be entertained.” These areas are known as “Areas of Special Biological Significance” (ASBS). ASBS are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

Statewide, there are 34 ASBS ocean areas monitored and maintained for water quality by the State Water Board. The ASBS in the North Coast Region are:

- Bodega (Sonoma County)
- Gerstle Cove (Sonoma County)
- Del Mar Landing (Sonoma County)
- Saunders Reef (Mendocino County)
- Jughandle Cove (Mendocino County)
- King Range (Humboldt and Mendocino counties)
- Trinidad Head (Humboldt County)

- Redwood National and State Parks (Humboldt County)

4.3 Aquatic Toxicity Provisions

The State Water Board established the Aquatic Toxicity Provisions (Toxicity Provisions) through Resolution No. 2020-0044, adopted on December 1, 2020, and Resolution No. 2021-0044, adopted on October 5, 2021. The Provisions include statewide numeric water quality objectives for both acute and chronic toxicity and a program of implementation to control toxicity. The Provisions provide consistent protection of aquatic life beneficial uses in inland surface waters, enclosed bays, estuaries, and coastal lagoons throughout the state from the effects of known and unknown toxicants. More information about the Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/aquatic_toxicity.html) (https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/aquatic_toxicity.html).

4.4 Bacteria Provisions and Variance Policy

In August 2018, the State Water Board adopted new statewide bacteria water quality objectives and implementation options to protect recreational users from the effects of pathogens in California water bodies, State Water Board Resolution No. 2018-0038 (Bacteria Provisions). Full text of the Bacteria Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/docs/bacteria.pdf) (https://www.waterboards.ca.gov/plans_policies/docs/bacteria.pdf).

4.5 California Ocean Plan

The *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) was first adopted on July 6, 1972 (State Water Board Resolution 72-45) and has been amended several times. The Ocean Plan establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California Coast outside of enclosed bays, estuaries, and coastal lagoons. Also, the Ocean Plan prescribes effluent quality requirements and management principles for waste discharges and specifies certain waste discharge prohibitions. Full text of the Ocean Plan can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/oceanplan2019.pdf) (https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/oceanplan2019.pdf).

4.6 California Thermal Plan

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan), adopted by the State Water Board in 1972 and amended in 1975, specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of enclosed bay and estuary waters and waste discharges. The Thermal Plan can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/docs/2023/thermpln.pdf) (https://www.waterboards.ca.gov/plans_policies/docs/2023/thermpln.pdf).

4.7 California Wetlands Conservation Policy

This policy, adopted in 1993 (Executive Order W-59-93), established state guidelines for wetlands conservation. The primary goal is to ensure no overall net loss and to achieve

a long-term net gain in the quantity, quality, and permanence of wetland acreage in California. The Executive Order can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf) (https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf).

4.8 Cannabis Cultivation Policy

The *Cannabis Cultivation Policy: Principles and Guidelines for Cannabis Cultivation* (Cannabis Cultivation Policy) was adopted in 2017 (State Water Board Resolution 2017-0063) and amended in 2019 (State Water Board Resolution 2019-0007). The Cannabis Cultivation Policy establishes principles and guidelines (requirements) for cannabis cultivation activities to protect water quality and instream flows. The purpose of the Cannabis Cultivation Policy is to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not have a negative impact on water quality, aquatic habitat, riparian habitat, wetlands, and springs. The Cannabis Cultivation Policy requirements are primarily implemented through the Water Boards Cannabis Cultivation General Order and Cannabis Small Irrigation Use Registration (SIUR) permits in addition to the California Department of Food and Agriculture's CalCannabis Cultivation Licensing Program. The Cannabis Cultivation Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/final_cannabis_policy_with_att_a.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/final_cannabis_policy_with_att_a.pdf).

4.9 Cleanup and Abatement Policies and Procedures

The *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* was adopted by the State Water Board in 1992 (State Water Board Resolution 92-49) and amended in 1996 (State Water Board Resolution 96-79). This policy describes the policies and procedures for investigation and cleanup and abatement of discharges under Water Code section 13304. The policy also provides detailed information on when a containment zone is appropriate and appropriate requirements. The Site Cleanup Program webpage has more information about applicable regulations, policies, plans, and procedures and can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/site_cleanup_program/) (https://www.waterboards.ca.gov/water_issues/programs/site_cleanup_program/).

4.10 Compliance Schedule Policy

The State Water Board adopted the *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits* in 2008 (State Water Board Resolution 2008-0025). This policy sets forth uniform provisions authorizing compliance schedules and establishes statewide consistency in the implementation of these provisions in the NPDES permit program. The full policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2008/rs2008_0025.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2008/rs2008_0025.pdf).

4.11 Comprehensive Response to Climate Change

Recognizing the challenges posed by climate change, on March 7, 2017, the State Water Board adopted a *Comprehensive Response to Climate Change* resolution,

directing a proactive approach to climate change in all Water Board actions, including drinking water regulation, water quality protection, and financial assistance (State Water Board Resolution No. 2017-0012). The resolution lays the foundation for a response to climate change that is integrated into all Water Boards actions. Directives included in the resolution include tracking and reporting on actions to reduce greenhouse gases, coordinating with interested parties to account for climate change, and developing recommendations for specific, enforceable actions that can be taken by the Water Boards to address climate change related impacts. To increase regulatory consistency, Resolution No. 2017-0012 also encourages Regional Water Boards staff to use climate change policy guidance from other agencies, such as the State of California Sea Level Rise Guidance produced by the California Coastal Commission and Ocean Protection Council. The full text of the *Comprehensive Response to Climate Change* can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/rs2017_0012.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/rs2017_0012.pdf).

4.12 Consolidated Cleanup Plan

The State Water Board adopted the Consolidated Toxic Hot Spots Cleanup Plan as a State Policy in 1999 (State Water Board Resolution 99-065) and amended in 2004 (State Water Board Resolution 2004-0002). This policy contains a specific definition of a toxic hot spot, ranking criteria to assist Water Boards in establishing priorities for addressing toxic hot spots in plans, and other measures necessary to facilitate completion of plans to address known toxic hot spots and prevent further pollution or creation of new toxic hot spots. The *Consolidated Cleanup Plan* can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/dfed_complete.pdf) (https://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/dfed_complete.pdf).

4.13 Enclosed Bays and Estuaries Plan

The *Water Quality Control Plan for Enclosed Bays and Estuaries of California- Sediment Quality Provisions* (Sediment Quality Provisions) complies with the legislative directive in California Water Code section 13393 that requires the State Water Board to develop sediment quality objectives (SQOs). The State Water Board adopted the Sediment Quality Provisions in September 2008 (State Water Board Resolution No. 2008- 0070) and amended the Provisions in April 2011 (State Water Board Resolution No. 2011-0017) and June 2018 (State Water Board Resolution No. 2018-0028). The Sediment Quality Provisions integrate chemical, toxicological, and biological measures to protect benthic communities in enclosed bays and estuaries, human health, wildlife, and resident finfish. The Sediment Quality Provisions include narrative SQOs for the protection of aquatic life; narrative SQOs for the protection of human health; narrative SQOs for the protection of wildlife and resident finfish; identification of the beneficial uses that these SQOs are intended to protect; and a program of implementation for each SQO. The Sediment Quality Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/sediment/sed_qual_provs.pdf): (https://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/sediment/sed_qual_provs.pdf).

4.14 Enclosed Bays and Estuaries Policy

The *Water Quality Control Policy for the Enclosed Bays and Estuaries of California* (Enclosed Bays and Estuaries Policy), adopted by the State Water Board in 1974 and amended in 1995, provides water quality principles and guidelines for the prevention of water quality degradation and the protection of beneficial uses of waters. The Enclosed Bays and Estuaries Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1995/rs1995_0084.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1995/rs1995_0084.pdf).

Decisions by the Regional Water Boards are required to be consistent with the provisions designed to prevent water quality degradation and to protect beneficial uses. The policy lists principles of management that include a statement of the desirability of phasing out all discharges (exclusive of cooling waters) as soon as practicable. Quality requirements state conformability with other plans and policies. Discharge prohibitions are placed on:

- new dischargers (other than those that would enhance the receiving waters);
- untreated waste and waste products;
- refuse;
- consequential effects of mining, construction, agriculture, and timber harvesting;
- materials of petroleum origin;
- radiological, chemical, or high-level radioactive waste; or
- discharge or bypass of untreated waste.

4.15 Enforcement Policy

The State Water Board adopted the *Water Quality Enforcement Policy* in 2009 (State Water Board Resolution 2009-0083) and amended the policy in 2017 and on December 5, 2023 (State Water Board Resolution 2023-0043). This policy provides guidance for the application of the California Water Code enforcement provisions and defines a consistent and transparent enforcement process and penalty methodology application. The Water Quality Enforcement Policy and amendments can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/enforcement/water_quality_enforcement.html) (https://www.waterboards.ca.gov/water_issues/programs/enforcement/water_quality_enforcement.html).

4.16 Human Right to Water Resolution

The California Water Code, Section 106.3, recognizes that “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.” The human right to water extends to all Californians, including disadvantaged individuals and groups and communities in rural and urban areas.

Recognizing that a wide range of activities and projects undertaken by the Water Boards may involve the human right to water, the State Water Board adopted Resolution No. 2016-0010, *Adopting the Human Right to Water as a Core Value and Directing its Implementation in Water Board Programs and Activities* on February 16, 2016. The resolution identifies the human right to water as a top priority and core value

of the Water Boards and affirms the State Water Board's commitment to considering how Water Board activities impact and advance the human right to safe, affordable and clean water to support basic human needs. Resolution No. 2016-0010 can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2016/rs2016_0010.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2016/rs2016_0010.pdf).

4.17 Listing Policy

Clean Water Act section 303(d) requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards by the next listing cycle. The State Water Board adopted the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* (Listing Policy) in September 2004 (State Water Board Resolution No. 2004-0063) to establish a standardized approach for developing California's Clean Water Act section 303(d) list in order to realize the overall goal of achieving water quality standards and maintaining beneficial uses in all of California's surface waters. The Policy was subsequently amended in February 2015 (State Water Board Resolution No. 2015-0005) to create a more efficient process for effective and timely submissions of the section 303(d) list to U.S. EPA.

The Listing Policy describes the process and methodologies used by the State and Regional Water Boards to comply with the listing requirements of Clean Water Act section 303(d). The policy establishes requirements for data quality, data quantity, and administration of the listing process. In order to make decisions regarding attainment of water quality standards, the policy provides guidance for interpreting data and information as they are compared to beneficial uses, existing numeric and narrative water quality objectives, and anti-degradation considerations and uses a weight-of-evidence approach. The policy specifies the frequency of exceedance of applicable water quality objectives that is necessary to make a determination that the water is impaired. The Listing Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf): (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf).

4.18 Impaired Waters Policy

The State Water Board adopted the *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options* (Impaired Waters Policy) on June 16, 2005 (State Water Board Resolution 2005-0050). This policy ensures that the impaired waters of the state are addressed in a timely and meaningful fashion. The policy provides guidance on principles that can be applied to resolve impairments in surface waters of the state and on processes that can be used to adopt Total Maximum Daily Loads in California. The Impaired Waters Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/iw_policy.pdf): (https://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/iw_policy.pdf).

4.19 Instream Flows Policy

The *Policy for Maintaining Instream Flows in Northern California Coastal Streams* (Policy) establishes principles and guidelines for maintaining instream flows for the protection of fishery resources, while minimizing water supply impacts on other beneficial uses of water, such as irrigation, municipal use, and domestic use. The Policy implements Water

Code section 1259.4, which was added by Assembly Bill 2121 (Stats. 2004, ch. 943, § 3). The geographic scope of the Policy encompasses coastal streams from the Mattole River to San Francisco and coastal streams entering northern San Pablo Bay, and extends to five counties: Marin, Sonoma, and portions of Napa, Mendocino, and Humboldt Counties. The Policy applies to applications to appropriate water, small domestic use, small irrigation use, and livestock stockpond registrations, and water right petitions.

The Policy does not establish specific instream flow requirements for particular rivers or streams. Nor does the Policy approve any particular water diversion projects, or specify the terms and conditions that will be incorporated into water right permits, licenses, or registrations. Instead, the Policy establishes guidelines for evaluating the potential impacts of water diversion projects on stream hydrology and biological resources. The Policy includes principles to ensure that new water appropriations and changes to existing water right permits and licenses will not affect the instream flows needed for fish spawning, migration and rearing, or the flows needed to maintain natural flow variability, which protects the various biological functions that are dependent on that variability. The Policy also contains principles to ensure that migration paths to spawning and rearing habitats are not blocked.

More information about the Instream Flows Policy and full text of the policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_flows/) (https://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_flows/).

4.20 Low-Threat Underground Storage Tank Closure Policy

The State Water Board adopted the *Underground Storage Tank (UST) Low-Threat Closure Policy* on May 1, 2012 (State Water Board Resolution 2012-0016). This policy protects public health and safety and the environment from releases of petroleum and other hazardous substances from USTs through four elements: the Leak Prevention Program, Office of Tank Tester Licensing, cleanup of petroleum releases from UST systems and Low Threat Closure, and enforcement. The full policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf).

4.21 Mercury Provisions

In May 2017, the State Water Resources Control Board adopted new statewide mercury objectives to protect the beneficial uses associated with the consumption of fish by both people and wildlife (State Water Board Resolution No. 2017-0027) (Mercury Provisions). The Mercury Provisions became effective on June 28, 2017. Through the Mercury Provisions, the State Water Board also established three new beneficial use definitions for use by the State and Regional Water Boards to designate water bodies with Tribal Traditional Culture (CUL), Tribal Subsistence Fishing (T-SUB), and Subsistence Fishing

(SUB/FISH) beneficial uses⁴⁴. The Mercury Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/docs/2023/mercury-tribe.pdf) (https://www.waterboards.ca.gov/plans_policies/docs/2023/mercury-tribe.pdf).

4.22 Municipal Solid Waste Policy

The *Policy for Regulation of Discharges of Municipal Solid Waste* (State Water Board Resolution 93-62), was adopted by the State Water Board in 1993 (State Water Board Resolution 93-62) and amended in 2005 (State Water Board Resolution 2005-0058). This policy implements state regulations of waste discharge to land (CCR Title 27, Division 2, Subdivision 1) and federal regulations related to municipal solid waste disposal (40 Code of Federal Regulations Sections 257 and 258). The policy directs Regional Water Quality Control Boards to revise or adopt Waste Discharge Requirements for all municipal solid waste landfills subject to state and federal regulations. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2005/rs2005-0058_rs93-62.pdf): (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2005/rs2005-0058_rs93-62.pdf).

4.23 Nonpoint Source Pollution Implementation and Enforcement Policy

The *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy) was adopted in 2004 (State Water Board Resolution 2004-0030). This policy explains how the “Nonpoint Source Management Plan” that was adopted in 1988 (State Water Board Resolution 88-123) will be implemented and enforced. The plan identifies nonpoint source control programs and milestones for their accomplishment. It emphasizes cooperation with local governments and other agencies to promote the implementation of Best Management Practices and remedial projects. The policy describes the required “key elements” of a nonpoint source pollution control implementation program including how significant non-compliance will be addressed.

Many waterbodies in the North Coast Region are impaired by nonpoint sources (NPS) of pollution, such as sediment discharges and elevated water temperatures. Therefore, many of the TMDL action plans in Chapter 6 focus on NPS pollution control.

The NPS Policy explains how existing permitting and enforcement tools will be used to address nonpoint sources of pollution. The NPS Policy states that all current and

⁴⁴ The North Coast Water Board’s basin plan does not currently contain the CUL, T-SUB and SUB beneficial uses as defined by the State Water Board. The Final Staff Report, Including Substitute Environmental Documentation for Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California— Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions (State Water Resources Control Board, 2017) states that “The new beneficial use definitions proposed by the provisions would not supersede the North Coast Water Board’s existing beneficial use definitions for Native American Culture and Subsistence Fishing contained in its basin plan.”

proposed NPS discharges must be regulated under waste discharge requirements (WDRs), waivers of WDRs, a basin plan prohibition, or some combination of these tools.

An NPS pollution control implementation program is a program developed to comply with WDRs, waivers of WDRs, or basin plan prohibitions. An NPS pollution control implementation program must contain five key elements, which are summarized as follows:

Key Element 1: Explanation of the purpose of the NPS pollution control implementation program and how it will meet water quality standards.

Key Element 2: Description of the management practices and other program elements that are to be used to meet water quality standards and an evaluation that ensures proper implementation.

Key Element 3: A time schedule with quantifiable milestones.

Key Element 4: Adequate monitoring.

Key Element 5: The potential consequences for failure.

The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/nps/docs/plans_policies/nps_i_policy.pdf) (https://www.waterboards.ca.gov/water_issues/programs/nps/docs/plans_policies/nps_i_policy.pdf).

4.24 Once-Through Cooling Water Policy for Coastal and Estuarine Waters

The *Water Quality Control Policy on the Use of Coastal and Estuarine Water for Power Plant Cooling* was adopted by the State Water Board on May 4, 2010 (State Water Board Resolution 20-0020) and amended several times, most recently on August 15, 2023 (State Water Board Resolution 2023-0025). This policy establishes requirements for the implementation of Clean Water Act section 316(b), using best professional judgment in determining best technology available (BTA) for cooling water intake structures at existing coastal and estuarine power plants that must be implemented in NPDES permits. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/otc-policy-2023/otc-policy-2023.pdf): (https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/otc-policy-2023/otc-policy-2023.pdf).

4.25 Once-Through Cooling Water Policy for Inland Waters (Power Plant Cooling Policy)

The *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling* was adopted by the State Water Board in 1975 (State Water Board Resolution 75-58). This policy indicates the State Water Board's position on power plant cooling, specifying that fresh inland waters should be used for cooling only when other alternatives are environmentally undesirable or economically unsound. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1975/rs75_058.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1975/rs75_058.pdf).

4.26 Onsite Wastewater Treatment Systems Policy

The *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy) was adopted by the State Water Board in 2012 (State Water Board Resolution 2012-0032), and amended in 2018 (State Water Board Resolution 2018-0019), and in 2023 (State Water Board Resolution 2023-0012). This policy implements California Water Code, Chapter 4.5, Division 7, section 13290-13291.7 by establishing statewide regulations and standards for permitting onsite wastewater systems. The OWTS Policy specifies criteria for existing and new onsite systems and establishes a conditional waiver of waste discharge requirements for onsite systems that comply with the policy. The OWTS Policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/owts/docs/adopted_owts_policy.pdf) (https://www.waterboards.ca.gov/water_issues/programs/owts/docs/adopted_owts_policy.pdf).

4.27 Recycled Water Policy

The main goals of the *Water Quality Control Policy for Recycled Water* (Recycled Water Policy) are to provide direction to the Regional Water Boards, proponents of recycled water projects, and the public regarding the appropriate criteria to be used in issuing permits for recycled water projects; increase the use of recycled water from municipal wastewater sources; and streamline and expedite permitting of recycled water projects by the Regional Water Boards. These goals will help promote long-term protection of regional groundwater supplies. The Recycled Water Policy was adopted by the State Water Board on February 9, 2009 and amended on January 22, 2013. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2018/121118_7_final_amendment_oal.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2018/121118_7_final_amendment_oal.pdf).

4.28 Sources of Drinking Water Policy

The *Sources of Drinking Water Policy* was adopted by the State Water Board in 1988 (State Water Board Resolution 88-63), and amended in 2006 (State Water Board Resolution 2006-0008) and in 2015 (State Water Board Resolution 2015-0002). This policy specifies which ground and surface waters are considered to be suitable or potentially suitable for the beneficial use of water supply (MUN). It allows Regional Water Boards some discretion to evaluate whether bodies of water are presently or potentially suitable for MUN designation. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2006/rs2006_0008_rev_rs88_63.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2006/rs2006_0008_rev_rs88_63.pdf).

4.29 State Implementation Policy

The State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Plan, or SIP) in 2000. The SIP contains implementation provisions for priority toxic pollutant criteria found within the National Toxics Rule and the California Toxics Rule and for priority pollutant objectives found in Basin Plans. The SIP applies to discharges of toxic pollutants and allows for a standardized approach for permitting, maintaining

statewide consistency. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/plans_policies/docs/2023/sip.pdf) (https://www.waterboards.ca.gov/plans_policies/docs/2023/sip.pdf).

4.30 State Policy for Water Quality Control

The State Water Board adopted the *State Policy for Water Quality Control* in 1972. This policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the basis for the adoption of subsequent water quality control policies. The policy can be found on the [California Legislative Information website](https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=WAT&division=7.&title=&part=&chapter=3.&article=3) (https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=WAT&division=7.&title=&part=&chapter=3.&article=3).

4.31 State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State

Resolution No. 2019-0015, adopted by the State Water Board on April 2, 2019 (State Water Board Resolution 2019-0015) and amended on April 6, 2021 (State Water Board Resolution 2021-0012), established the following: 1) a wetland definition; 2) a framework for determining if a wetland feature is a water of the state; 3) wetland delineation procedures; and 4) procedures for the submittal, review, and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Wetland Definition and Procedures can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf) (https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf).

4.32 Supplemental Environmental Projects Policy

The Policy on Supplemental Environmental Projects was adopted in 2009 and amended on December 5, 2017 (Resolution 2017-0074). This Policy guides the process of the Regional or State Water Board accepting a Supplemental Environmental Project (SEP) that may allow a discharger to satisfy part of the monetary assessment imposed in an administrative civil liability (ACL). California Water Code section 13385(i) allows limited use of SEPs associated with mandatory minimum penalties and provides criteria and reporting requirements for qualifying SEPs. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/seps/20180503_sep_policy_amd.pdf) (https://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/seps/20180503_sep_policy_amd.pdf).

4.33 Trash Provisions

The Trash Provisions, adopted by the State Water Board on April 7, 2015 (State Water Board Resolution 2015-0019) do the following: (1) establish a narrative water quality objective for trash, (2) corresponding applicability, (3) establish a prohibition on the discharge of trash, (4) provide implementation requirements for permitted stormwater and other discharges, (5) set a time schedule for compliance, and (6) provide a framework for monitoring and reporting requirements. The Trash Provisions can be found at the [State Water Board's website](https://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/seps/20180503_sep_policy_amd.pdf)

(https://www.waterboards.ca.gov/water_issues/programs/trash_control/docs/trash_appendix_e_121615.pdf).

4.34 Water Reclamation Policy

The *Policy with Respect to Water Reclamation in California* was adopted by the State Water Board in 1977 (State Water Board Resolution 77-1). This policy requires the Regional Water Boards to conduct reclamation surveys and specifies reclamation actions to be implemented by the State Water Board and Regional Water Boards as well as other agencies. The policy can be found at the [State Water Board's website](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1977/rs77_001.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1977/rs77_001.pdf).

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The programs of implementation contained in Chapters 4, 5 and 6 are designed to restore and maintain water quality conditions to be consistent with the water quality standards established for the North Coast Region. The water quality standards are contained in Chapters 2 and 3 and are composed of the beneficial uses of water (Chapter 2), the numeric and narrative water quality objectives that represent the minimum condition necessary to protect the most sensitive beneficial uses (Chapter 3), and the antidegradation policy, which establishes the conditions under which the North Coast Water Board can allow degradation of high-quality waters (i.e., waters that exceed the minimum water quality objectives for at least some constituents).

The North Coast Water Board carries out implementation through National Pollutant Discharge Elimination System (NPDES) permits issued pursuant to Section 402 of the Clean Water Act, water quality certifications pursuant to section 401 of the Clean Water Act, waste discharge requirements (WDRs), and waivers of WDRs. The programs of implementation that apply regionwide are located in this chapter (Chapter 5), statewide programs of implementation are summarized in Chapter 4, and waterbody specific programs of implementation including, but not limited to TMDL Action Plans, are found in Chapter 6.

5.1 Permitting and Enforcement Tools

The federal Clean Water Act and the California Water Code (CWC) authorize the North Coast Water Board to use permitting and enforcement tools to control waste discharges and ensure attainment of water quality standards. The North Coast Water Board shall use permitting and enforcement tools, when and where appropriate, to address waste discharges and ensure attainment of water quality standards and TMDLs.

5.1.1 Permitting Tools

Permitting tools include, but are not limited to, the authority to:

1. Require technical reports and reports on the conditions and operation of a facility, in accordance with CWC §13267.
2. Require monitoring reports, in accordance with CWC §13267.
3. Inspect a facility, in accordance with CWC §13267.
4. Permit the discharge of waste, or proposed discharge of waste, to waters of the state through Waste Discharge Requirements (WDRs), in accordance with Article 4 of the CWC. WDRs may take the form of individual or project-specific WDRs, watershed-specific WDRs, or general WDRs that are applicable to a specific activity.
5. Waive the requirement for a WDR, in accordance with CWC §13269.

6. Permit the discharge of waste to waters of the United States through National Pollutant Discharge Elimination System (NPDES) permits, in accordance with Section 402 of the Clean Water Act and CWC §13370.
7. Certify that proposed activities which require a federal permit or license comply with water quality standards, in accordance with Section 401 of the Clean Water Act.

Permits and waivers may apply to individuals, organizations, activities, and/or watersheds in the North Coast Region or the State of California.

5.12 Enforcement Tools

Enforcement tools include, but are not limited to, the authority to:

1. Require a time schedule of specific actions to be taken, in accordance with CWC §13300.
2. Issue a cease and desist order, in accordance with CWC §13301.
3. Issue a cleanup and abatement order, in accordance with CWC §13304.
4. Impose monetary liabilities or fines (administrative civil liabilities), in accordance with CWC §13268 and §13350.

Enforcement actions should be consistent with the State Water Board's *Water Quality Enforcement Policy*,⁴⁵ adopted February 19, 2002, and as subsequently amended. The Enforcement Policy promotes a fair, firm, and consistent enforcement approach appropriate to the nature and severity of a violation.

5.2 Point Source Measures

5.2.1 Waste Discharge Prohibitions

Section 13243 of the Porter-Cologne Water Quality Control Act authorizes the North Coast Water Board - in a water quality control plan or in waste discharge requirements - to specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted.

Under this authority and in order to achieve water quality objectives, protect present and future beneficial water uses, protect public health, and prevent nuisance, the North Coast Water Board declares that point source waste discharges, except as stipulated by the Thermal Plan, the Ocean Plan, and the action plans and policies contained in the Point Source Measures section of this Water Quality Control Plan, are prohibited in the following locations in the North Coast Region:

⁴⁵SWRCB Res. No. 2002-0040. 23 CCR §2910.

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Klamath River Basin

1. All surface, freshwater impoundments and their tributaries, with the exception of the lower Lost River system.
2. Crescent City Harbor and all estuaries in accordance with the provisions of the State Water Board's "Water Quality Control Policy for the Enclosed Bays and Estuaries of California."
3. Smith River and its tributaries.
4. Klamath River and its tributaries, including but not limited to the Trinity, Salmon, Scott, and Shasta rivers and their tributaries.
5. The Applegate, Illinois, and Winchuck rivers and their tributaries.
6. On all coastal streams and natural drainage ways that flow directly to the ocean, all new discharges will be prohibited. Existing discharges to these waters will be eliminated at the earliest practicable date.
7. All intertidal reaches of the coast.
8. Areas of Special Biological Significance.
9. All other tidal waters unless it is demonstrated on the basis of waste characteristics, degree and reliability of treatment, rate of mixing and dilution, and other technical factors that water quality objectives will be met and all beneficial uses will be protected.

North Coastal Basin

1. All surface freshwater impoundments and their tributaries.
2. All bays and estuaries in accordance with the provisions of the State Water Resources Control Board's "Water Quality Control Policy for the Enclosed Bays and Estuaries of California".
3. The Mad and the Eel rivers and their tributaries during the period May 15 through September 30 and during all other periods when the waste discharge flow is greater than one percent of the receiving stream's flow as set forth in NPDES permits.⁴⁶

⁴⁶ For dischargers not in compliance with the seasonal prohibition and waste discharge rate limitation, time schedules shall be set forth in National Pollutant Discharge Elimination System (NPDES) permit updates for each discharger. In addition, each

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4. The Russian River and its tributaries during the period of May 15 through September 30 and during all other periods when the waste discharge flow is greater than one percent of the receiving stream's flow as set forth in NPDES permits. In addition, the discharge of municipal waste during October 1 through May 14 shall be of advanced treated wastewater in accordance with effluent limitations contained in NPDES permits for each affected discharger, and shall meet a median coliform level of 2.2 mpn/100 ml.⁴⁷
5. The North Coast Water Board will consider exceptions for cause to the waste discharge rate limitations set forth in Prohibitions 3. and 4. (above). Exceptions shall be defined in NPDES permits for each discharger, on a case by case basis, and in accordance with the following:
 - a. The wastewater treatment facility shall be reliable.
 - b. Reliability shall be demonstrated through analysis of the features of the facility including, but not limited to, system redundancy, proper operation and maintenance, and backup storage capacity to prevent the threat of pollution or nuisance.
 - c. The discharge of waste shall be limited to rates and constituent levels which protect the beneficial uses of the receiving waters.
 - d. Protection shall be demonstrated through analysis of all the beneficial uses of the receiving waters. For receiving waters which support domestic water supply (MUN) and water contact recreation (REC-1), analysis shall include expected normal and extreme weather conditions within the discharge period, including estimates of instantaneous and long-term minimum, average, and maximum discharge flows and percent dilution in receiving waters. The analysis shall evaluate and address cumulative effects of all discharges, including point and nonpoint source contributions, both in existence and reasonably foreseeable. For receiving waters which support domestic water supply (MUN), the North Coast Water Board shall consider the California Department of Health Services evaluation of compliance with the Surface Water Filtration and Disinfection Regulations contained in Section 64650

discharger not in compliance shall report to the North Coast Water Board on progress towards compliance on an annual basis.

⁴⁷ For dischargers not in compliance with the waste discharge rate limitation and/or advanced wastewater treatment, time schedules shall be set forth in NPDES permit updates for each discharger. In addition, each discharger not in compliance shall report to the North Coast Water Board on progress towards compliance on an annual basis.

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through 64666, Chapter 17, Title 22 of the California Code of Regulations. Demonstration of protection of beneficial uses shall include consultation with the California Department of Fish and Wildlife regarding compliance with the California Endangered Species Act.

- e. The exception shall be limited to that increment of wastewater which remains after reasonable alternatives for reclamation have been addressed.
 - f. The exception shall comply with State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California," and the federal regulations covering antidegradation (40 CFR §131.12).
 - g. There shall be no discharge of waste during the period May 15 through September 30.
6. On all other coastal streams and natural drainageways that flow directly to the ocean all new discharges will be prohibited. Existing discharges to these waters will be eliminated at the earliest practicable date.
7. All intertidal reaches of the coast.
8. Areas of Special Biological Significance.
9. All other tidal waters unless it is demonstrated on the basis of waste characteristics, degree and reliability of treatment, location of discharge, rate of mixing and dilution, and other technical factors that water quality objectives will be met and all beneficial uses will be protected.

5.2.2 Schedules of Compliance

The North Coast Water Board may establish a Schedule of Compliance in a NPDES permit under the following circumstances:^{48,49}

⁴⁸ Schedules of compliance for CTR criteria are independently authorized and governed by 40 CFR 122.47 and 131.38, and the State "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (CTR-SIP). This amendment is intended to supplement, not supersede, these provisions required by the CTR-SIP. All CTR limits must be consistent with the CTR-SIP and applicable federal rules.

⁴⁹ Schedules of compliance for Non-NPDES Waste Discharge Requirements (WDRs)

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1. Where an existing discharger⁵⁰ has demonstrated, to the North Coast Water Board's satisfaction, that it is infeasible to achieve immediate compliance with effluent and/or receiving water limitations specified to implement new, revised, or newly interpreted water quality objectives, criteria, or prohibitions.⁵¹
2. Where a discharger is required to comply with Total Maximum Daily Loads (TMDLs) adopted as a single permitting action,⁵² and demonstrates that it is infeasible to achieve immediate compliance with effluent and/or receiving water limits that are specified to implement new, revised or newly interpreted objectives, criteria, or prohibitions.

The schedule of compliance shall include a time schedule for completing specific actions (including interim effluent limits) that demonstrate reasonable progress toward attaining the effluent and/or receiving water limitations, water quality objectives, criteria, or prohibitions. The schedule of compliance shall contain interim limits and a final compliance date based on the shortest feasible time required to achieve compliance (determined by the North Coast Water Board at a public hearing after considering the factors identified below).

Schedules of compliance in NPDES permits for existing NPDES permittees shall be as short as feasible, but in no case exceed the following:

are also independently authorized by Porter Cologne, and will continue to be adopted on a case-by-case basis.

⁵⁰ Existing discharger is defined in the State "Policy for Implementation of Toxic Substance Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," (CTR-SIP) as any discharger (non-NPDES or NPDES) that is not a new discharger. An existing discharger includes an increasing discharger (i.e., an existing facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after November 29, 2006). A new discharger includes any building, structure, facility, or installation from which there is, or may be, a discharge of pollutants, the construction of which commenced after November 29, 2006.

⁵¹ New, revised, or newly interpreted water quality objectives, criteria, or prohibitions means: 1) objectives as defined in Section 13050(h) of Porter-Cologne; 2) criteria as promulgated by the United States Environmental Protection Agency (USEPA); or 3) prohibitions as defined in the *Water Quality Control Plan for the North Coast Region* that are adopted, revised, or newly interpreted after November 29, 2006. Objectives and criteria may be narrative or numeric.

⁵² "Single permitting actions" means those where the North Coast Water Board incorporates the requirements to implement a TMDL through one NPDES permit. These actions would not require a Basin Plan amendment, but would require a technical staff report to support the permit requirements and any permit specified compliance schedule. Furthermore, the USEPA would still be required to approve the TMDL under the federal CWA Section 303(d).

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- Up to five years from the date of permit issuance, re-issuance, or modification that establishes effluent and/or receiving water limitations specified to implement new, revised, or newly interpreted objectives, criteria, or prohibitions. A permittee can apply for up to a five-year extension, but only where the conditions of the schedule of compliance have been fully met, and sufficient progress toward achieving the objectives, criteria, or prohibitions has been documented.
- In no case shall a schedule of compliance for these dischargers exceed ten years from the effective date of the initial permit that established effluent and/or receiving water limitations specified to implement new, revised, or newly interpreted objectives, criteria, or prohibitions.

TMDL-derived effluent and/or receiving water limitations that are specified to implement new, revised, or newly interpreted water quality objectives, criteria, or prohibitions that are adopted as a single permitting action:

- In this scenario, schedules of compliance shall require compliance in the shortest feasible period of time, but may extend beyond ten years from the date of the permit issuance.

To document the need for and justify the duration of any such schedule of compliance, a discharger must submit the following information, at a minimum. The North Coast Water Board will review the information submitted to determine if a schedule of compliance is appropriate.

For all applicants:

- A written request, and demonstration, with supporting data and analysis, that it is technically and/or economically infeasible⁵³ to achieve immediate compliance with newly adopted, revised or newly interpreted water quality objectives, criteria or prohibitions.
- Results of diligent efforts to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream.
- Documentation of source control efforts currently underway or completed, including compliance with any pollution prevention programs that have been established.
- A proposed schedule for additional source control measures or waste treatment.
- The highest discharge quality that is technically and economically feasible to

⁵³ Technical and economic feasibility shall be determined consistent with State Board Order 92-49.

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achieve until final compliance is attained.

- A demonstration that the proposed schedule of compliance is as short as technically and economically feasible.
- Data demonstrating current treatment facility performance to compare against existing permit effluent limits, as necessary to determine which is the more stringent interim limit to apply if a schedule of compliance is granted.
- Additional information and analyses, to be determined by the North Coast Water Board on a case-by-case basis.

5.2.3 Interim Policy on the Regulation of Waste Discharges from Underground Petroleum Tank Systems

At present, the North Coast Water Board is using the following laws, policies, regulations and guidelines as the basis for investigations and cleanup of discharges from underground petroleum tank systems:

- The Porter-Cologne Water Quality Control Act
- The Water Quality Control Plan for the North Coast Region
- Chapters 15 and 16, Division 3, Title 23, California Code of Regulations
- State Water Resources Control Board Resolution No. 68-16
- The Health and Safety Code

It shall be the policy of the North Coast Water Board to implement a program to investigate and cleanup groundwater pollution caused by unauthorized releases of petroleum from underground tanks that protects water quality while at the same time minimizes the cost to responsible parties and the public in general. The following principles shall constitute the North Coast Water Board's interim policy:

1. With respect to all underground petroleum tank cases in this region, the North Coast Water Board's highest priority will be to eliminate pollutant sources through tank removal, free product removal, and removal of contaminated soil to the extent practicable. If required, the need for further remedial action will be based on impacts on the beneficial uses of affected waters as determined by reasonable monitoring or other investigation.
2. The North Coast Water Board will then assign the highest priority to the resolution of underground petroleum tank cases where drinking water sources are being adversely impacted or are imminently threatened to be adversely impacted.

3. Where practicable, the North Coast Water Board will schedule the investigation and cleanup of petroleum pollution by responsible parties to coincide with the availability of funds.
4. Where practicable, the North Coast Water Board will recognize the use of alternative cleanup techniques such as in-situ bioremediation and passive remediation.
5. The North Coast Water Board will assist the State Water Resources Control Board and claimants to the State Underground Storage Tank Cleanup Fund to further reduce investigative and cleanup costs while continuing to protect water quality:
 - a. through technology transfer;
 - b. through appropriate regulatory policy and legislative recommendations; and
 - c. through continuing coordination to implement regulatory policy and law.

5.2.4 Interim Action Plan for Cleanup of Groundwaters Polluted with Petroleum Products and Halogenated Volatile Hydrocarbons

Discharges of waste from treatment facilities designed to remove pollutants from groundwaters polluted with petroleum products and halogenated volatile hydrocarbons shall be permitted to surface waters of the North Coast Region year-round with no discharge flow limitations based on the flow of the receiving water provided that the following conditions are met:

1. The discharge from the treatment facility shall be pollutant-free.⁵⁴
2. The discharge shall not adversely affect the beneficial uses of the receiving water.
3. The discharge is necessary because a polluted groundwater cleanup operation is required by an action of the North Coast Water Board.

⁵⁴ For the purposes of this Interim Action Plan, pollutants are defined as those constituents and their breakdown products that were discharged to soils and/or groundwaters that necessitated a groundwater cleanup. Pollutant-free is defined as discharges that contain no detectable levels of pollutants as analyzed in currently approved EPA or State of California methodology. The North Coast Water Board will define detectable levels in terms of numerical limits and shall specify such limits in individual NPDES permits or waste discharge requirements.

4. The discharge is necessary because no feasible alternative to the discharge (reInjection, reclamation, evaporation, discharge to a community wastewater treatment and disposal system, etc.) is available.
5. The discharge is regulated by NPDES Permit/Waste Discharge Requirements.
6. The discharger has demonstrated consistent compliance with Provision 1, above.
7. The discharge is in the public interest.

5.2.5 Action Plan for Low Threat Discharges

The North Coast Water Board finds that there are categories of discharges that pose a low threat to water quality when conducted and managed properly. A low threat discharge is generally a planned discharge that is short-term and/or of minimized volume from a definable project that results in a point source discharge to surface waters and that is managed in a manner that does not threaten the quality or beneficial uses of water without additional dilution. These discharges meet the definition of a waste,⁵⁵ and as such, are required to be permitted pursuant to the California Water Code. These low threat discharges can cause, or threaten to cause minor impairment of existing or potential beneficial uses of the receiving water if they are not properly managed through best management practices that remove pollutants and minimize the volume, rate, and duration of discharge.

The purpose of this Action Plan is to identify procedures for regulating low threat point source discharges that can be demonstrated to not have an adverse impact on beneficial uses or water quality and for which there are no other reasonable discharge alternatives, and thus provide exceptions to the Basin Plan Point Source Waste Discharge Prohibitions, set out at the beginning of this chapter.

Discharges resulting from the following sources could be determined to be low threat provided that the discharge does not contain pollutants in quantities that could adversely affect beneficial uses and the discharge meets specific criteria identified in this Action Plan:

- Construction dewatering;
- Installation, development, test pumping, maintenance and purging of water supply

⁵⁵ California Water Code, Section 13050(d) defines a waste as including “sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of disposal.”

or geothermal wells;

- Hydrostatic testing, maintenance, repair, and disinfection of potable water supply vessels, pipelines, tanks, reservoirs, etc.;
- Hydrostatic testing of newly constructed pipelines, tanks, reservoirs, etc., used for purposes other than potable water supply (e.g., gas, oil, reclaimed water, etc.);
- Dredge spoils dewatering;
- Other similar types of discharges that pose a low threat to water quality, yet technically must be regulated under a surface water discharge permit.

Low threat point source discharges may be permitted to surface waters and may be exempted from the Basin Plan seasonal and year-round point source discharge prohibition and discharge flow limitation, provided that the following conditions are met:

- 1) The discharge shall not adversely affect the beneficial uses of the receiving water or cause a condition of nuisance.
- 2) The discharge shall comply with all applicable water quality objectives.
- 3) Best practicable treatment or control of the discharge shall be implemented to assure that pollution and nuisance will not occur, and the highest water quality consistent with maximum benefit to the people of the State will be maintained.
- 4) The discharge is necessary because no feasible alternative to the discharge (reclamation, evaporation, infiltration, discharge to a sanitary sewer system, etc.) is available.
- 5) The discharge is limited to that increment of wastewater that remains after implementation of all reasonable alternatives for reclamation or disposal.
- 6) The discharge is regulated by NPDES Permit/Waste Discharge Requirements.

Low threat discharges that result in the discharge of pollutants to surface waters shall be covered under an NPDES permit/Waste Discharge Requirements. Several permit options are available, including, but not limited to statewide general municipal, industrial, or construction stormwater permits, Statewide General NPDES Permit for Discharges from Utility Vaults and Underground Structures, North Coast Water Board general permits designed to address low threat discharges, and individual permits.

Discharges may be eligible for consideration for permit coverage as a low-threat discharge after the discharger submits specific information to the North Coast Water

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Board for review and approval as required by and outlined in the appropriate permit or as otherwise required by the North Coast Water Board.

5.2.6 Action Plan for Stormwater Discharges

Stormwater runoff is part of the natural hydrologic cycle; however, human activities, particularly industrialization and urbanization, can result in significant and problematic changes to the natural hydrology of an area. As a result, when rain falls, pollutants may become dissolved in or eroded into, and carried by runoff, without treatment, into surface waters. These pollutants, unless controlled, may degrade the beneficial uses of surface waters. In addition to having direct effects on water quality, industrialization and urbanization of watersheds often alter natural runoff patterns. Stormwater that would infiltrate into soils or get captured by vegetation and natural topography can get intercepted by impervious surfaces or compacted soils. Storm drain systems collect this runoff and discharge it directly into waterways. Increased runoff amounts and alteration of peak discharge rates can result in stream bank erosion, modification of natural habitat conditions and increased downstream flooding.

To address the recognized stormwater problems, the U.S. Congress added Section 402(p) to the federal Clean Water Act in 1987. This section, and the federal regulations which implement it (40 CFR 122, 123, 124, November 1990), require NPDES permits for stormwater discharges from municipalities and industries, including construction. The 1987 Clean Water Act amendments require municipalities to reduce pollutant discharges to the maximum extent practicable, and industries, including construction, to implement Best Available Technology and Best Conventional Pollutant Control Technology to reduce pollutants.

As a result of Section 402(p), the State of California developed a program for the implementation of four types of stormwater permits:

- Phase I municipal stormwater permits for municipalities serving greater than 100,000 people,
- Phase II municipal stormwater permits for urbanized areas serving less than 100,000 people,
- Industrial stormwater permits for facilities that discharge storm water associated with industrial activities requiring a general permit pursuant to 40 Code of Federal Regulations, Section 122.26(b)(14), and
- Construction stormwater permits for sites that create land disturbance of one acre or more.

Within the stormwater permitting program, the State Water Resources Control Board (State Water Board) has issued statewide general permits for the regulation of stormwater from Phase II municipalities, and industrial and construction activities. In addition, the

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State Water Board has issued a statewide stormwater permit to the California Department of Transportation (CalTrans) in order to regulate municipal and construction stormwater discharges from the state highway system and associated facilities. Enforcement of all categories of stormwater permits is the responsibility of the North Coast Water Board. The North Coast Water Board is also responsible for adopting Phase I municipal permits and may elect to adopt site-specific or regionwide municipal, industrial and construction site permits. In addition, provisions of the Clean Water Act allow the North Coast Water Board to issue NPDES stormwater permits to other construction, industrial or municipal sources based on a finding that these discharges are significant sources of pollutants to surface waters.

The statewide general Phase II municipal permit and the Phase I municipal permit for the Santa Rosa area require stormwater dischargers to implement a Stormwater Management Program (SWMP) to reduce or prevent pollutants in stormwater discharges and authorized non-storm water discharges, and to eliminate or minimize non-stormwater discharges. The SWMP must include the following elements: public education and outreach; public involvement in development and implementation of the SWMP, inspections of commercial and industrial sites, inspections of stormwater infrastructure and facilities, including construction sites, that may discharge stormwater or non-stormwater flows to the stormwater infrastructure; monitoring of the stormwater infrastructure (visual, water quality samples, other environmental indicators), including a program to detect and eliminate illicit discharges; pollution prevention and good housekeeping program for municipal operations; complaint response, and enforcement of violators. The Phase I and II municipal permits also require special programs aimed at construction sites, including the development and implementation of construction site stormwater runoff control programs and post-construction stormwater management programs. The post-construction stormwater management program should include measures to implement low-impact design features on an individual site and area-wide basis. The goal of the program is to minimize the impact of new development on stormwater quality and quantity. The statewide general industrial and construction stormwater permits ("statewide general stormwater permits") also require the implementation of best management practices (BMPs), including structural and non-structural controls to prevent and minimize pollutants in stormwater and authorized non-stormwater discharges.

The statewide general stormwater permits, CalTrans permit and the North Coast Water Board's Phase I permit all acknowledge that municipal and industrial stormwater conveyance systems may receive certain de minimis categories of non-stormwater discharges, including, but not limited to, flows from water line flushing, irrigation, air conditioning condensate, dechlorinated swimming pool discharges, and fire hydrant flow testing, that are not expected to be sources of pollutants as determined by studies conducted or approved by the State and Regional Water Boards. The stormwater permits do not prohibit certain types of low-threat non-stormwater discharges from entering the storm drain system, provided that they are not significant contributors of pollutants to the municipal stormwater conveyance system and do not result in violation of water quality standards. Although these discharges may individually pose little threat to water quality, the stormwater permittee is required to implement certain control measures to ensure that these discharges, individually and cumulatively do not adversely impact water quality.

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The allowable low threat non-stormwater discharges fall into two categories: (1) intentional discharges that are planned, routine and occur on an on-going basis and (2) incidental discharges that are unanticipated, accidental, and infrequent. Examples of intentional low threat non-stormwater discharge categories, include, but are not limited to discharges from foundation, footing and crawl space drains, residential swimming pool draining, air-conditioning condensate, and residential car washing. Examples of incidental low threat non-stormwater discharge categories include, but are not limited to, accidental discharges from potable water sources due to unexpected line breaks, incidental runoff of potable or recycled water from landscape irrigation due to an unexpected break in irrigation line or sprinkler head, and flows from emergency fire-fighting activities. The intentional discharges, by nature, are expected to have a lower risk of containing pollutants or causing other water quality problems such as erosion, because they are subject to planning to minimize pollutants and to control the rate, volume and timing of the discharge. Although the intentional discharge categories may cause nuisance, they require a lesser BMP program than the incidental discharges. Due to the unplanned nature of incidental discharges, this category of non-stormwater discharges poses a slightly greater risk to water quality due to the potential for higher levels of pollutants and less opportunity to control the rate, volume, and timing of the discharge.

Discharges of stormwater and certain categories of low threat non-stormwater flows (identified in paragraph 6 above and in individual and general stormwater permits) from permitted stormwater conveyance systems shall not be subject to the Basin Plan's point source waste discharge prohibitions provided that the following conditions are met:

- 1) The discharge and the activities which affect the discharge are managed in conformance with the provisions of the applicable NPDES permit.
- 2) The discharge does not cause adverse effects on the beneficial uses of the receiving water.
- 3) The permittee shall implement a general management program to eliminate or minimize non-stormwater discharges into surface waters. The program shall be submitted to the North Coast Water Board for approval and include implementation of BMPs, outreach and education, inspections, monitoring, reporting and enforcement provisions.

In addition, incidental discharges of low threat non-stormwater flows from permitted stormwater conveyance systems shall not be subject to the Basin Plan's point source waste discharge prohibitions provided that the following additional conditions are met:

- 1) The incidental discharge event is not due to negligent maintenance or poor design of infrastructure, or failure to oversee the activity that resulted in incidental runoff.
- 2) There were no feasible alternatives to the incidental discharge event, such as retention of the incidental runoff. This condition is not satisfied if measures for capturing the incidental discharge should have been installed to prevent

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incidental runoff, in the exercise of reasonable engineering judgment.

- 3) The permit holder and/or potable/recycled water user has a management plan, approved by the North Coast Water Board Executive Officer, that identifies best management practices designed to avoid, minimize, and where appropriate mitigate incidental runoff incidents. The management plan must include education/outreach, inspection, monitoring, and enforcement components.

The North Coast Water Board will continue to implement Section 402(p) of the Clean Water Act by permitting discharges of stormwater from municipalities which own and operate stormwater sewer systems, and discharges associated with industrial and construction activity (as defined in 40 CFR Part 122), to surface waters of the North Coast Region.

The following policy shall be implemented with respect to discharges from individual waste treatment and disposal systems.

5.2.7 Onsite Wastewater System Requirements

Requirements for siting, design, operation, maintenance, and management of onsite wastewater systems are specified in the State Water Resources Control Board's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy). The OWTS Policy defines OWTS as individual disposal systems, community collection and disposal systems, and alternative collection and disposal systems that use subsurface disposal. OWTS do not include "graywater" systems pursuant to Health and Safety Code Section 17922.12. The OWTS Policy sets forth a tiered implementation program with requirements based upon levels (tiers) of potential threat to water quality. The OWTS Policy includes a conditional waiver of waste discharge requirements for on-site systems that comply with the policy.

The OWTS Policy, including future revisions, is incorporated by reference into this Basin Plan and shall be implemented according to the policy's provisions. A copy of the OWTS Policy can be found on the [State Water Resources Control Board website](https://www.waterboards.ca.gov/water_issues/programs/owts/) (https://www.waterboards.ca.gov/water_issues/programs/owts/).

Region-Specific Maintenance Responsibilities

Maintenance, monitoring, and repair of individual waste treatment and disposal systems shall be the responsibility of:

- 1) The individual property owner; or
- 2) A legally responsible entity of dischargers empowered to carry out such functions. That legally responsible entity shall be a public agency, unless demonstration is made to the North Coast Water Board that an existing public agency is unavailable and formation of a new public agency is unreasonable. If such a demonstration is made, a private entity must be established with adequate financial, legal, and institutional resources to

assume responsibility for waste discharge.

5.2.8 Policy on Disposal Of Solid Wastes

Solid waste has been discarded to land throughout the North Coast Region. Solid waste can adversely affect water quality through (1) direct contact with receiving waters, (2) production of leachate which can subsequently commingle with receiving waters, and (3) the production of carbon dioxide which can subsequently dissolve in receiving waters. The resulting adverse effects on water quality may include: bacterial contamination, toxicity, tastes and odors, oxygen depletion, discoloration, turbidity, and increases in mineral and organic compound concentrations.

Under the State Water Board's Land Disposal program oversight, the North Coast Water Board implements solid waste containment and protection regulations for ground and surface water resources for sites and facilities where waste is discharged to land. Requirements for siting, operation, and closure of waste disposal sites are prescribed, implemented, and enforced through the issuance of waste discharge requirements (WDRs) and compliance and enforcement efforts to ensure adequate protection of water quality.

The North Coast Water Board's solid waste program focuses on the protection of water quality by implementing the following regulations, laws, and policies:

1. The regulations governing discharges of non-hazardous wastes to land in California Code of Regulations, Title 27, Division 2 cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities;
2. The regulations governing discharges of hazardous wastes to land in California Code of Regulations, Title 23, Division 3, Chapter 15 cover landfills, surface impoundments, and waste piles;
3. The federal regulations for nonhazardous landfills under the Resource Conservation and Recovery Act (RCRA), Subtitle D, (Title 40, Code of Federal Regulations, Part 258 (40CFR258));
4. The State Water Board's Policy for Water Quality Control for Regulation of Discharges of Municipal Solid Waste (Resolution No. 93-62);
5. The State Water Board's General Waste Discharge Requirements for Disaster-Related Wastes (Order WQ 2020-0004-DWQ);
6. To efficiently support the diversion of organic material from landfills to composting operations while providing requirements to protect water quality, the State Water Board developed General Waste Discharge Requirements for Composting Operations (Composting General Order) on August 4, 2015 (order WQ 2015-0121-

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DWQ) and an additional order adopted on April 7, 2020 (Order WQ 2020-0012-DWQ). Together they are the Composting General Order which is administered by the North Coast Water Board.

The North Coast Water Board policy on disposal of solid waste is to require the orderly implementation of Chapter 15 and Title 27 requirements for all activities which constitute a discharge of waste to land and the application of federal Subtitle D regulations for municipal landfills.

In carrying out its mandate to protect water quality and regulate solid waste, the North Coast Water Board has joint regulatory authority with the California Department of Resources Recycling and Recovery (CalRecycle) permitting, compliance, closure, and remediation programs. CalRecycle is a coordinating agency for nonhazardous waste management in California and the California Department of Toxic Substances Control (DTSC) is the lead agency for hazardous waste management. The North Coast Water Board also interacts with the local enforcement agencies (principally county governments), which enforce the requirements of the CalRecycle and DTSC, and issue solid waste facility permits.

This policy describes the collaborative approach to the management of solid waste as required by federal and state regulations and policies. Implementation of this policy is necessary to protect beneficial uses of surface and ground waters in the North Coast Region.

5.2.9 Policy for Agricultural Wastewater Management

The regulation of wastewater resulting from confined animal facilities is described in 40 CFR §122.23 and administered by the North Coast Water Board. The federal regulations require NPDES permits for point source surface water discharges that meet the federal definition of confined animal feeding operation (CAFO).

Other discharges of waste, such as irrigation return flows, may not require an NPDES permit under federal regulation. However, the state may prescribe waste discharge requirements for any point source discharger from agricultural operations, facilities, or activities, regardless of type or size. The state may also prescribe waste discharge requirements for any nonpoint source discharge to surface water or groundwater, as described under the Nonpoint Source Measures section of this chapter.

5.2.10 Action Plan for Regulation of Mining Wastes

Several hundred existing and abandoned mines are located within the north coastal area. Many of the mines in the Klamath River Basin are being reworked for gold as a result of rising world gold prices. Improper operation and in some cases poor location have resulted in turbidity and sediment discharges which adversely affect beneficial uses.

A number of mining operations, principally sand and gravel extraction, occur in the watersheds of the North Coastal Basin. In addition to sand and gravel, numerous other commodities such as manganese, copper, mercury, and crushed rock have been mined. The major potential problems relating to these operations are increased turbidity resulting

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from wash-off or discharge of tailings, and the toxic threat of heavy metals to aquatic organisms.

The regulation of mining waste is described in the California Code of Regulations, Title 23, Division 3, Chapter 15. To implement the Code and to protect the quality of waters from adverse effects resulting from mining waste discharges, the North Coast Water Board shall (1) adopt waste discharge requirements on operations which could potentially adversely affect water quality in the North Coast Region, (2) immediately issue cleanup and abatement orders to mining operations which are potentially or actually adversely affecting water quality, (3) immediately begin documentation of waste discharges for purposes of taking enforcement actions if necessary, (4) issue enforcement orders when appropriate, and (5) seek civil penalties and/or refer violations of cleanup and abatement orders and cease and desist orders to the Attorney General.

5.2.11 Action Plan for Accidental Spills and Contingencies

On July 24, 1974, the North Coast Water Board adopted Resolution No. 74-151 entitled "Contingency Planning and Notification Requirements for Accidental Spills and Discharges". The Order was formulated and adopted by the North Coast Water Board when it became apparent that specific waste dischargers were unprepared for emergency situations.

The Order requires entities which discharge, convey, supply, store, or otherwise manage wastes to (1) formulate and submit a contingency plan to the North Coast Water Board, (2) immediately report to the Board by telephone any accidental discharge, (3) begin immediate cleanup and abatement activities, and (4) confirm the telephone notification in writing within two weeks of the incident. The written notification is to include the reason for the discharge, the duration and the volume of the discharge, steps taken to correct the problem, and steps taken to prevent the problem from recurring. In the event of a spill or discharge emergency, the North Coast Water Board acts as a liaison with the discharger and other affected agencies and persons to provide assistance in clean-up and abatement activities.

Section 25180.7 of the Health and Safety Code requires designated employees of the North Coast Water Board to inform local agencies of any illegal discharge or threatened illegal discharge of a hazardous waste.

Section 13271 (a) of the Porter-Cologne Water Quality Control Act requires immediate notification of illegal and accidental discharges of sewage or hazardous substances to the Office of Emergency Services and the North Coast Water Board, and further requires that the Regional Water Board: 1) list all such notifications at its next business meeting, and 2) notify appropriate local health officials.

5.2.12 Policy on the Regulation of Fish Hatcheries, Fish Rearing Facilities, and Aquaculture Operations

Fish hatcheries, fish rearing facilities, and aquaculture operations, if regulated, may enhance beneficial water uses. These operations characteristically require the utilization of large quantities of water on a continuous basis. Most of the water is used to satisfy the flow-through requirements of the fish, and is returned to the receiving waters without

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alteration of beneficial uses. Wastes generated during the care and feeding of fish may include suspended and settleable solids, salt (sodium chloride), antibiotics, anesthetics, and disease control agents. The following criteria shall apply to the discharge from fish hatcheries, rearing facilities, and aquaculture operations:

1. The discharge shall not adversely impact the recognized existing and potential beneficial uses of the receiving waters.
2. The discharge of waste resulting from cleaning activities shall be prohibited.
3. The discharge of detectable levels of chemicals used for the treatment and control of disease, other than salt (NaCl) shall be prohibited.
4. The discharge will be subject to review by the North Coast Water Board for possible issuance of Waste Discharge Requirements/NPDES permit.
5. The North Coast Water Board may waive Waste Discharge Requirements for fish hatcheries, fish rearing, and aquaculture facilities, provided that the discharge complies with applicable sections of the Water Quality Control Plan for the North Coast Region and satisfies the conditions for waiver which are described in North Coast Water Board Resolution No. 87-113 (Appendix Section of this Plan).
6. The public interest is served by the fish hatchery, rearing facility, or aquaculture operation.

5.2.13 Policy on Power Plant Cooling

Utilization of fresh waters of the basin for power plant cooling poses both quantity and quality problems. Approximately 25,000 acre-feet of water per year are required for cooling purposes for each 1,000 megawatts of installed generating capacity if evaporative cooling towers are used. Losses of cooling water through evaporation would be approximately 22,000 acre-feet per each 1,000 megawatts of generating capacity. Such losses for power plant cooling could seriously affect the availability of water for other consumptive uses, and may impair the beneficial use of the water for such nonconsumptive uses as esthetic, fish and wildlife habitat, and recreation purposes.

The utilization of fresh inland waters of the region for power plant cooling is regulated by the State Water Resources Control Board's Thermal Plan. In addition, the North Coast Water Board can adopt waste discharge requirements on power plant cooling operations which could potentially adversely affect water quality in the region.

5.2.14 Policy On Residual Wastes

Residual wastes such as raw sludge from sewage treatment plants shall be disposed of only at sites approved by the North Coast Water Board. In approving such sites the Board shall be guided by the regulations contained in the California Code of Regulations, Title 23, Division 3, Chapter 15.

5.3 Nonpoint Source Measures

In the North Coast Region, nonpoint source discharges are the principal sources of contaminant discharges to surface water and groundwater. Nonpoint source discharges generally occur when water, such as stormwater, drainage, or seepage, flows across a modified, disturbed, or contaminated landscape, entraining pollutants that are then delivered to a water of the state or placed on the landscape where they are at risk of being delivered to a water of the state.

Nonpoint source discharges are diffuse in origin and variable in quality. Management of nonpoint source discharges is in many ways more difficult to achieve than point source discharges, since it requires an array of control techniques customized to local watershed conditions. Management practices are structural and non-structural (operational) controls applied before, during and after pollution producing activities to eliminate or reduce the generation of nonpoint source discharges. Management practice implementation typically requires: 1) adaptation to site specific or regional specific conditions; 2) monitoring to ensure that practices are properly applied and are effective in attaining and maintaining water quality standards; 3) immediate mitigation of a problem where the practices are not effective; and 4) improvement of management practice implementation or implementation of additional practices when needed to resolve a deficiency. Nonpoint source discharge in the North Coast Region may result from such activities as timber, agriculture, cannabis operations and includes roads; construction; and gravel, rock and mineral mining operations, among others.

The State Water Board adopted the Plan for California's Nonpoint Source Pollution Control Program in 1999 and the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program in 2004. The North Coast Water Board must regulate all nonpoint sources of pollution, using the administrative permitting authorities provided by Porter-Cologne. These include: 1) Basin Plan waste discharge prohibitions, 2) Waste Discharge Requirements, and 3) Waivers of Waste Discharge Requirements that provide conditions for discharge and expire no later than 5 years after adoption or any combination.

5.3.1 Action Plan for Logging, Construction, and Associated Activities

The following waste discharge prohibitions pertain to logging, construction, and associated activities in the North Coast Region.

1. The discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.
2. The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities which could be deleterious to fish, wildlife, or other beneficial uses is prohibited.

Similarly, the guidelines for implementation of the prohibitions have proven most helpful to the North Coast Water Board and its staff as well as to potential waste dischargers.⁵⁶ They reflect state regulations, objectives, and procedures, and are as follows:

5.3.2 Guidelines for Implementation and Enforcement of Discharge Prohibitions Relating to Logging, Construction, or Associated Activities

These guidelines, which are hereby incorporated into the *Water Quality Control Plan for the North Coast Region* (Basin Plan), have been developed with the objective of (1) defining the criteria by which the North Coast Water Board will consider that violations of the prohibitions have occurred or threaten to occur; (2) instructing the North Coast Water Board staff of procedures and actions they will take in implementing the prohibitions; (3) advising all potential dischargers of the scope and intent of the prohibitions; and (4) advising all interested parties that it is the intent of the North Coast Water Board to carry out its responsibilities in this matter in a reasonable and effective manner.

Criteria

Chapter 3 of the Basin Plan contains water quality objectives, which specify limitations on certain water quality parameters that are not to be exceeded as a result of waste discharges. Accordingly, the Executive Officer of the North Coast Water Board is directed to investigate and report to the North Coast Water Board evidence of violations of the water quality objectives contained in the Basin Plan which result or threaten to result in unreasonable effects on the beneficial uses of the waters of the North Coast Region. When such investigation reveals that such violations are occurring or are threatened due to the discharge or threatened discharge of waste, the Executive Officer shall take all appropriate actions as directed by the Enforcement section of these guidelines.

The following water quality objectives, from Chapter 3 of the Basin Plan, are considered of particular importance in protecting beneficial uses from unreasonable effect due to discharges from logging, construction, or associated activities:

1. Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
2. Turbidity shall not be increased more than 20 percent above naturally occurring background levels.
3. Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance or adversely affect the beneficial uses.

⁵⁶ Since 1984 these guidelines have been applied to watershed disruptions which might be caused by small hydropower development projects, and the prohibitions are recognized by project sponsors as the water quality protection standard for these activities.

4. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
5. Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.
6. 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.
7. 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.
8. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

B. Definitions

1. Definitions for the following terms in these guidelines are provided in Section 13050 of the Porter-Cologne Act:

"Waste" includes sewage and any and all other substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature, including such waste placed within containers of whatever nature prior to, and for purposes of, disposal.

"Beneficial uses" of the waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation, aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources of preserves.

"Water quality objectives" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

"Water quality control" means the regulation of any activity or factor which may affect the quality of the waters of the state and includes the prevention and correction of water pollution and nuisance.

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"Water quality control plan" consists of a designation or establishment for the waters within a specified area of (1) beneficial uses to be protected, (2) water quality objectives, and (3) a program of implementation needed for achieving water quality objectives.

"Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects: (1) such waters for beneficial uses, or (2) facilities which serve such beneficial uses. "Pollution" may include "contamination".

2. The definition for "stream or watercourse" as those terms are used in the waste discharge prohibitions relative to logging and construction activities shall be interpreted by the North Coast Water Board to mean the following: Natural watercourse as designated by a solid line or dash and three dots symbol shown in blue on the largest scale United States Geological Survey Topographic Map most recently published.
- B. The North Coast Water Board acknowledges that it does not have jurisdiction for direct enforcement of the rules and regulations of other local, state, or federal agencies. However, the North Coast Water Board directs the Executive Officer to investigate the violation or threatened violation of those rules and regulations of other agencies which have been adopted to protect the quality of the waters in the North Coast Region. The violation of the following rules, regulations, or provisions may be considered a threatened violation of the waste discharge prohibitions and accordingly the Executive Officer shall take appropriate action as directed by the Enforcement section of these guidelines.
1. A violation of current rules for forest practices relating to erosion control or water quality protection in any logging or related activity being conducted pursuant to regulations administered by the California Department of Forestry and Fire Protection.
 2. A violation of the Best Management Practices designated in the U.S. Forest Service document entitled "Water Quality Management for National Forest System Lands in California", dated April, 1979.
 3. A violation of the water pollution control provisions of the current California Standard Specifications in any highway project being constructed under contract entered into by the Department of Transportation, State Department of Public Works.
 4. A violation of Sections 1601, 1602, 1603, 5650, and 5948 of the California Fish and Wildlife Code when such violation involves activities or discharges enumerated in the aforesaid prohibition.

Investigative and Coordinating Activities

- A. The North Coast Water Board directs the Executive Officer to implement the following investigative activities. It is intended that, wherever possible, existing state reporting procedures and requirements will be utilized to minimize additional administrative burden on prospective waste dischargers.

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1. The staff of the North Coast Water Board is directed to investigate and review, on a continuing basis, logging operations, road building, and related construction activities within the region to determine the effect, or potential effect, of such activities on water quality.
2. The staff shall consult with any individual associated with logging operations, road building or construction activities having an effect on the quality of waters in the region, and shall investigate such activities when requested to do so.
3. The staff shall obtain from the California Department of Forestry and Fire Protection, the Board of Forestry, and the Department of Fish and Wildlife copies of all notices received from timber operations, timber harvesting plans, and stream alteration activities within the region.
4. The staff shall obtain from the Department of Transportation the names of all contractors performing work that could result in violation of the discharge prohibitions. The Forest Service, USDA and other federal agencies will be requested to furnish the North Coast Water Board, as early as feasible, with the names, addresses, and location of anticipated operations of all private contractors who will be engaged in logging, construction or related activities on lands in the region which are under their control. In connection with these contracts, request will be made for copies of any special conditions or regulations for the control of erosion or protection of water quality.
5. Upon receipt and review of such information, the staff will transmit to the permittee or contractor copies of the discharge prohibitions and provisions as contained in the Basin Plan and copies of this or subsequent implementation statements on this subject issued by the North Coast Water Board.
6. The staff will request that the California Department of Forestry and Fire Protection notify the North Coast Water Board's office of citations or of other notices issued by Forestry personnel for violation of erosion control sections of the Forest Practice Rules. The staff will request that the Department of Fish and Wildlife advise the North Coast Water Board's office of all violations of its code Sections 5650, 1601, 1602, and 5948 resulting from logging, road building, or associated construction activities. The staff will request that the Department of Transportation notify the North Coast Water Board office of all violations of the water pollution control provisions of the California Standard Specifications and will request that the Forest Service, USDA, and other federal agencies, notify the North Coast Water Board's office of all violations of rules and regulations for the control of erosion or protection of water quality.
7. The staff will notify the California Department of Fish and Wildlife, the California Department of Forestry and Fire Protection, the State Department

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of Transportation, the Forest Service, USDA, and the violating timber operator and/or land owner, of all violations of the discharge prohibitions and of all actions taken by the North Coast Water Board with regard to such violations or threatened violations.

8. The staff may request additional information from any individual or firm engaged in timber operations, road building, or related construction activity in accordance with Water Code Section 13267(b) as may be necessary to implement their investigations and carry out the policy of this North Coast Water Board.
- B. The North Coast Water Board considers that implementation of the discharge prohibitions relating to logging, construction, or associated activities can provide appropriate protection to waters of the region from these sources of waste and, in the great majority of their activities, will waive the need for reports of waste discharge and waste discharge requirements. However, where investigations indicate that the beneficial uses of water may be adversely affected by waste discharges, the staff shall require the submission of Reports of Waste Discharge.

Enforcement Activities

When investigation by the staff reveals that violations as described in the Criteria section of these guidelines are occurring or are threatened due to the discharge or threatened discharge of waste, the actions to be taken by the Executive Officer are as follows:

- A. Cleanup and Abatement Order
 1. If the discharge of waste can be cleaned up or its adverse effects abated, a cleanup or abatement order shall be issued to the discharger or other responsible persons.
 2. The order and all relevant information shall be transmitted to the discharger as provided in the Manual of Administrative Procedures. Copies of these materials shall be transmitted concurrently to all North Coast Water Board members and all other interested agencies.
 3. The North Coast Water Board may hold a public hearing for purposes of making the necessary findings under Water Code Section 13350(a)(2) with respect to a cleanup or abatement order or violation of waste discharge prohibition at any regular meeting of the North Coast Water Board, or at a special meeting of the North Coast Water Board called by the Chairman, on his own motion or at the request of the Executive Officer, or when called by two North Coast Water Board members as provided in Water Code Section

13204.

B. Cease and Desist Order

If a cleanup or abatement order would not be the most expeditious means of achieving compliance with the prohibitions, the Executive Officer shall notify the North Coast Water Board Chairman of his intention to bring the matter before the North Coast Water Board, at either a regular or a special meeting, for consideration of evidence and recommendation that a cease and desist order be issued. The decision by the Executive Officer to recommend a cease and desist order hearing shall be made after consideration of the following factors:

1. The nature of the activity of the discharger.
2. The anticipated length of time the discharger will be carrying on the activity which results or threatens to result in a waste discharge.
3. The potential deleterious and unreasonable effect on beneficial uses of the waters during the time before the North Coast Water Board will be able to take action on the violation of the prohibitions.
4. Other relevant factors considered applicable by the Executive Officer as necessary to bring before the North Coast Water Board for their consideration and deliberation.

5.3.3 Policy for the Control of Discharges of Herbicide Wastes from Silvicultural Applications

It is the policy of this North Coast Water Board to assure that the use and possible discharge of herbicide wastes be controlled to provide all necessary protection of the beneficial uses of water. Accordingly, the North Coast Water Board establishes a program to control the discharge of herbicides to waters of the state within the North Coast Region to protect water quality. It is the policy of the North Coast Water Board to determine safe limits for the discharge of pollutants, including herbicides. All limits will be incorporated into the Action Plan as they are determined and self-monitoring programs will be developed and prescribed to assure compliance with all appropriate limits.

5.3.4 Action Plan for Control of Discharges of Herbicide Wastes from Silvicultural Applications

The North Coast Water Board acknowledges that it is not the lead agency in regulating pesticide use in the North Coast Region; the lead agency is the Department of Food and Agriculture (DFA). However, the North Coast Water Board recognizes its obligation in regulating all wastes discharged to water and in protecting water quality. It is not the North Coast Water Board's intent to prescribe waste discharge requirements for pesticide applications when the rules, regulations, and guidelines of other agencies adequately

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protect beneficial water uses. It is not the intent of the North Coast Water Board to require the discharger to furnish information that has already been furnished to other agencies. Accordingly, the Executive Officer shall obtain the needed information from other governmental agencies to the maximum extent possible. Therefore, the North Coast Water Board directs the Executive Officer to obtain information on proposed aerial herbicide application projects which will provide assurance that the proposed silvicultural herbicide use will protect water quality. Such information includes, but is not limited to, the following:

- a. Topographic map or other map scaled at not less than four inches equals one mile or other scale acceptable to the Executive Officer which clearly delineates the treatment areas and all nearby water courses, wells, ponds, irrigation ditches, or wet areas.
- b. Description of the application method and means employed to avoid discharge to water.
- c. A water monitoring plan responsive to the need for an "early warning" capability.
- d. A spill contingency and control plan indicating downstream water users and the mechanism to provide "early warning" in the event of substantial water contamination.
- e. This information should be received by the North Coast Water Board 45 days in advance of the operation.

The Executive Officer shall consult with the discharger and the lead agencies to mitigate threatened discharges which would violate any section of this Action Plan. Issues unable to be resolved shall be brought before this North Coast Water Board for consideration of the need to adopt waste discharge requirements.

The North Coast Water Board acknowledges that it does not have jurisdiction for direct enforcement of the rules and regulations of other local, state, or federal agencies. However, the North Coast Water Board directs the Executive Officer to investigate the violation or threatened violation of those rules and regulations of other agencies which have been promulgated to protect the quality of the waters of the state within the North Coast Region and to appropriately enforce violations of the Water Code.

The violation of the following rules, regulations, or provisions may be considered a violation of the waste discharge prohibitions in this Action Plan and accordingly the Executive Officer shall take appropriate action.

1. A violation of current rules, regulations, or guidelines relating to water quality protection from any silvicultural herbicide application being conducted pursuant to permits issued by the County Agricultural Commissioners.
2. A violation of federal or state label requirements relating to water quality protection.

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3. A violation of current rules, regulations, or guidelines of the DFA relating to water quality protection.

In accordance with this policy, limits have been determined for three herbicides. Accordingly, the following prohibitions apply to waste discharges from herbicide applications of 2,4,5-T, 2,4,5-TP, and 2,4-D:

1. There shall be no discharge of 2,4,5-T or 2,4,5-TP to waters of the state within the North Coast Region.
2. There shall be no discharge of 2,4-D PGBE ester to waters of the state within the North Coast Region that would cause the concentration of this substance in the receiving waters to exceed an instantaneous value of 40 parts per billion (ppb) acid equivalent or a 24-hour average of 2 ppb acid equivalent.

Monitoring programs will be designed to measure both the maximum instantaneous concentration and a statistically valid 24-hour average concentration of 2,4-D. Sampling locations for monitoring will be selected on the basis of the risk of discharge and the probable presence of beneficial water uses to be protected. Discharge monitoring will occur during and shortly after spraying and with stormwater.

Violations of water quality objectives contained in Chapter 3, particularly the objectives relating to pesticides and toxicity, shall be brought to the immediate attention of the County Agricultural Commissioner. In addition, the California Environmental Quality Act functional equivalent requirements of Section 21080.5 as adopted by the DFA and certified by the Resources Agency on November 1, 1979, require that the County Agricultural Commissioners meet quarterly with the North Coast Water Board staff and other agencies concerned with resource protection. These quarterly consultations should develop needed mitigation to prevent violation of waste discharge prohibitions and Basin Plan objectives. The United States Forest Service has developed Best Management Practices for the application of herbicides and other pesticides on public lands to ensure protection of water quality. Accordingly,

1. The North Coast Regional Water Quality Control Board hereby accepts United States Forest Service Practices 5.8-5.14 as Best Management Practices for water quality protection from aerial herbicide application on Forest Service lands within the North Coast Region, and recognizes the "Aerial Herbicide Application Handbook" (FSH 2109.21) as a management practice that best protects water quality.
2. Experience gained over the past several years by the United States Forest Service on implementation of these management practices has led the North Coast Water Board to conclude that discharges from aerial spray applications can be controlled such that: (1) past or present standards for protection of water quality are not violated, (2) Basin Plan water quality objectives are met, (3) most (99 percent) United States Forest Service spray application monitored

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result in less than 2 ppb of 2,4-D or similar herbicides being detected in receiving waters.

3. The Basin Plan contains provisions (as specified in the Action Plan above) for adequate descriptions of treatment areas and application practices, monitoring programs, and spill contingency planning that, combined with the implementation of Best Management Practices by the United States Forest Service or other entity, will result in the waiver of issuance of waste discharge requirements (excluding issuance of requirements under No. 4 below).

Adoption of waste discharge requirements are hereby waived as not contrary to the public interest when the United States Forest Service Best Management Practices are implemented, relevant Basin Plan provisions are followed, and water quality is protected.

4. Waste Discharge Requirements shall be issued on a case-by-case basis where the implementation of Best Management Practices proposed for specific projects will be insufficient for protection of water quality.

The State Legislature, Department of Food and Agriculture, and the County Agricultural Commissioners have developed a body of laws, regulations, and permit conditions for the application of herbicides and other pesticides on forest lands to ensure protection of water quality. Accordingly,

The North Coast Regional Water Quality Control Board accepts the practices conducted pursuant to the state pesticide regulatory program and the County Agricultural Commissioner regulatory program as Best Management Practices for water quality protection from aerial herbicide application on private lands within the North Coast Region, and recognizes the mitigation measures developed through permit conditions set by the County Agricultural Commissioners as management practices that best protect water quality.

Experience gained over the past several years by private forest landowners on implementation of these management practices has led the North Coast Water Board to conclude that discharges from aerial spray applications can be controlled such that: (1) past or present standards for protection of water quality are not violated, (2) Basin Plan water quality objectives are met, (3) most (98%) of private landowner spraying applications monitored result in less than 10 ppb of 2,4-D or similar herbicides being detected in receiving waters (92% result in less than 2 ppb).

The Basin Plan (as specified in the Action Plan above) contains provisions for adequate descriptions of treatment areas and application practices, monitoring programs, and spill contingency planning that, combined with the implementation of Best Management Practices by private landowners, will result in the waiver of issuance of waste discharge requirements (excluding issuance of requirements under Number 4 below).

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Adoption of waste discharge requirements are hereby waived as not contrary to the public interest when Best Management Practices are implemented, relevant Basin Plan provisions are followed, and water quality is protected.

Waste Discharge Requirements shall be issued on a case-by-case basis where the implementation of Best Management Practices proposed for specific projects will be insufficient for protection of water quality.

5.3.5 Policy for the Implementation of the Water Quality Objectives for Temperature

The strategy for implementing the intrastate and interstate water quality objectives for temperature in the North Coast Region is set forth in the *Policy Statement for Implementation of the Water Quality Objective for Temperature in the North Coast Region* (Temperature Policy).⁵⁷ The North Coast Water Board shall address sources of elevated water temperature regionwide but on a case-by-case basis in the context of a given permit or other action as appropriate and necessary to reduce impairments and prevent further impairment.

The water quality objectives for temperature shall be implemented through a combination of riparian management and other temperature controls as appropriate in nonpoint source control programs; permits and waivers, grants and loans, and enforcement actions; support of restoration projects; and coordination with other agencies with jurisdiction over controllable factors that influence water temperature.⁵⁸ Controllable water quality factors affecting water temperature include, but are not limited to, any anthropogenic activity which results in the removal of riparian vegetation that provides shade to a waterbody, sediment discharges, impoundments and other channel alterations, the reduction of instream summer flows, and the reduction of cold water sources.

To attain and maintain the water quality objectives for temperature, the North Coast Water Board and its staff will implement programs and collaborate with others in such a manner as to prevent, minimize, and mitigate temperature alterations associated with the following factors:

1. Activities with the potential to reduce riparian shading of waterbodies;
2. Activities with the potential to increase sediment delivery;
3. The quality, quantity, location and timing of effluent, storm water, and agricultural return flow discharges;
4. The location, size, and operation of in-channel impoundments with the ability to alter the natural temperature regime;

⁵⁷ North Coast Water Board Resolution No. R1-2012-0013 is hereby incorporated by reference.

⁵⁸ Section 13247 of the Porter-Cologne Water Quality Control Act requires other state offices, departments, and boards to carry out their activities in a manner that complies with water quality control plans approved or adopted by the State Water Board.

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5. Actions with the potential to change stream channel geometry;
6. Activities with the potential to reduce instream flows or reduce sources of cold water, including cold water refugia.

This policy in no way limits the State Water Board or North Coast Water Board's authority and discretion to develop riparian management measures and other measures as appropriate and necessary for a specific land use, activity, or geographic area, and in consideration of existing regulatory and non-regulatory programs in place that provide temperature protections.

The North Coast Water Board shall take the following actions to achieve temperature objectives and implement temperature TMDLs, including U.S. EPA-established TMDLs:

1. Restore and maintain riparian shade,⁵⁹ as appropriate, through nonpoint source control programs; permits and waivers, grants and loans, and enforcement actions; support of restoration projects; and coordination with other agencies with jurisdiction over controllable factors that influence water temperature, as appropriate.
2. Continue to implement the Sediment TMDL Implementation Policy as a means of addressing elevated water temperature associated with excess sediment discharges. Implement sediment controls consistent with the approach articulated in the Sediment TMDL Implementation Policy to address temperature concerns associated with sediment in areas not impaired by sediment.
3. Examine and address temperature impacts when developing and implementing permits or programs for nonpoint source activities. Consider and implement, where applicable, all available measures to prevent and control the elevation of water temperatures in permit or program development. Such measures shall include, but are not limited to, sediment Best Management Practices and cleanups,

⁵⁹ The removal of vegetation that provides shade to a waterbody is a controllable water quality factor. Riparian shade-related temperature TMDL load allocations are based on the concept of "site-specific potential effective shade," which means the shade equivalent to that provided by topography and potential vegetation conditions at a site. Shade controls that are effective at correcting temperature impairments also operate to prevent impairments, and provide other water quality protections such as bank stability and filtering sediment and other waste discharges. The North Coast Water Board has discretion on how to implement load allocations on a case-by-case basis. This policy is not intended to predetermine precise parameters for riparian shade for a specific location or land use. Where non-Water Board programs provide riparian shade that result in attainment of water quality standards, the North Coast Water Board will rely on and incorporate those programs.

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memoranda of understanding or agreement with other agencies, prohibitions against waste discharges, management of riparian areas to retain shade, and control and mitigation of tailwater and impoundments. Where appropriate, include monitoring requirements for incorporation into permits, programs, and other orders to confirm management actions required to prevent or reduce elevated temperatures are implemented and effective.

4. Address factors that contribute to elevated water temperatures when issuing 401 certifications, NPDES permits, Waste Discharge Requirements, or Waivers of Waste Discharge Requirements, or Prohibitions.
5. Use other regulatory, executive, and enforcement tools, as appropriate, to address elevated water temperatures and preserve existing cold water resources.
6. Support and encourage restoration projects that are designed to eliminate, reduce, or mitigate existing sources of temperature impairments. Administer, encourage, and support the use of grant funds to facilitate projects that address elevated water temperature concerns. Pursue non-regulatory actions with organizations, landowners, and individuals to encourage the control of elevated water temperatures, watershed restoration, and protection activities.
7. Continue to coordinate with the Division of Water Rights by participating in the water right application and petition process, providing monitoring recommendations, conducting joint compliance inspections, submitting data in support of 401 certifications related to water diversions and/or facilities regulated by the Federal Energy Regulatory Commission, and any other appropriate means to help ensure that the terms of water right permits and licenses are consistent with the water quality objectives for temperature.
8. Coordinate with the Division of Water Rights on the development of instream flow studies and flow objectives, as appropriate.
9. Provide cities, counties, state, and federal agencies guidance and recommendations on compliance with the water quality objectives for temperature. Work with local governments to develop strategies to address the prevention, reduction, and mitigation of elevated water temperatures, including, but not limited to, ordinances, general plans, and other management policies.
10. Identify statewide policies under development with implications for water temperature, collaborate with State Water Board counterparts, and provide recommendations and guidance with respect to this policy.

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11. Develop and implement a regionwide water temperature trend monitoring program to assist the North Coast Water Board in determining whether this policy is effectively reducing and preventing elevated temperatures over the long-term.
12. Develop and maintain a temperature implementation workplan consistent with the policy to prioritize efforts, track progress, and identify specific actions to address elevated water temperatures. The temperature implementation workplan shall describe specific actions that will be taken throughout the North Coast Region and set watershed priorities for addressing elevated water temperatures at a watershed-specific level. The temperature implementation workplan shall be presented to the North Coast Water Board on a triennial basis.

5.3.6 Policy in Support of Restoration in the North Coast Region

To achieve the objectives of the Clean Water Act and Porter-Cologne, the North Coast Water Board must take an active role in promoting the implementation of restoration projects that are expected to help restore the chemical, physical, and biological integrity of the waters within the North Coast Region.

Restoration projects are implemented for the purpose of eliminating, reducing or ameliorating a variety of conditions that can negatively impact aquatic ecosystems, including but not limited to: water pollution, eutrophication, desiccation, habitat simplification, species displacement, migration barriers, erosion from diverted streams, riparian zone disturbance, effects of climate change, or other impairments to the beneficial uses of waters of the state.

The Policy in Support of Restoration in the North Coast Region includes Resolution No. R1-2015-0001, which accomplishes the following: (1) recognizes the important role that restoration plays in restoring and maintaining water quality, (2) highlights some of the barriers that inhibit implementation of restoration projects, (3) describes the work being done by the North Coast Water Board and its staff to support restoration, (4) describes the regulatory requirements for permitting restoration projects, and (5) provides direction on how the North Coast Water Board and its staff will continue to promote and support restoration in the future.

5.3.7 Guidelines for Implementation of Restoration Policy

The Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program requires that all current and proposed nonpoint source discharges be regulated under waste discharge requirements, waivers of waste discharge requirements, basin plan prohibitions, or some combination of these administrative tools. The implementation of restoration projects with potential to cause nonpoint source discharges of waste into waters of the state is regulated similarly to other types of nonpoint source activities.

The State and Regional Water Boards use permitting authorities to implement the requirements of applicable state policies and state and regional water quality control plans. Boards may permit or certify restoration projects that result in significant and

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sometimes unavoidable impacts (including temporary exceedances of water quality objectives) if it is shown that the project will result in long-term protection of beneficial uses and water quality. In issuing waste discharge requirements, the North Coast Water Board may include a time schedule, subject to revision at the discretion of the Board and pursuant to the provisions of Water Code section 13263. Similarly, in issuing a water quality certification under the Clean Water Act section 401, the state certifies a federal project or a project required to obtain a federal permit with conditions to protect beneficial uses and meet water quality objectives. The state has discretion to condition the water quality certification based on the circumstances of a specific project, and may include time schedules for achieving compliance.

The Basin Plan includes prohibitions that apply to restoration projects within the Action Plan for the Garcia River Watershed Sediment TMDL (2002) and the Action Plan for the Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in the Klamath River in California and Lost River Implementation Plan (2010). Both of these watershed-specific action plans describe the North Coast Water Board's support for restoration efforts and provide methods for compliance with the prohibitions.

The Basin Plan also includes waste discharge prohibitions within the Action Plan for Logging, Construction, and Associated Activities. While useful as an enforcement tool to regulate certain nonpoint source or unpermitted discharges, the Action Plan for Logging, Construction, and Associated Activities is not necessary to regulate or enforce upon otherwise authorized restoration projects. Therefore, it shall not be construed to prohibit any restoration project subject to a permit or other order of the State or Regional Water Boards.

6. Total Maximum Daily Loads and Watershed Specific Action Plans

Section 303(d) of the federal Clean Water Act (33 USC §1313) requires that “Each state shall identify those waters within its boundaries for which the effluent limitations... are not stringent enough to implement any water quality standard applicable to such waters.” The Clean Water Act requires states to establish a priority ranking for waters on the Section 303(d) list of impaired waters and to establish total maximum daily loads for such waters.

Total maximum daily load (TMDL) is the maximum amount of a pollutant that a body of water can contain and still achieve water quality standards. Strategies for implementing the pollution load reductions needed to achieve the TMDL and move the water body toward attainment of water quality standards may be adopted in several ways, as described by the Impaired Waters Policy below. When watershed specific TMDL implementation strategies are incorporated into the Basin Plan, they are known as TMDL action plans.

This section of the Basin Plan contains (1) a description of policies and regulatory tools that are applicable to TMDLs, (2) a list of all TMDLs for the North Coast Region, and (3) TMDL action plans for specific waterbodies and pollutants. Future TMDLs, and TMDL action plans will be added as they are approved.

6.1 Policies and Regulatory Tools Applicable To TMDLs

6.1.1 Impaired Waters Policy

The Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options (Impaired Waters Policy)⁶⁰ is a statewide policy that describes the process for developing and adopting TMDLs. In summary, the Impaired Waters Policy states that TMDLs may be adopted in any of the following ways:

1. TMDLs and TMDL implementation strategies may be adopted with a basin plan amendment or another regulation or policy for water quality control.
2. TMDLs and TMDL implementation strategies may be adopted with a permitting action, enforcement action, or other single regulatory action.
3. TMDLs and TMDL implementation strategies may be adopted with a resolution that certifies either that (1) a regulatory program has been adopted and is being implemented by another state, regional, local, or federal agency; or (2) a non-regulatory program is being implemented by another entity.

The Impaired Waters Policy also states that TMDLs and TMDL implementation strategies will be incorporated into the Basin Plan, even if they are initially adopted through a regulatory process that is not a basin plan amendment. This is in compliance with Sections 303(d)(2) and 303(e)(3) of the Clean Water Act.

⁶⁰ SWRCB Res. No. 2005-0050.

6.1.2 Sediment TMDL Implementation Policy

The TMDL implementation strategy for sediment-impaired waterbodies in the North Coast Region is set forth in the *Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters in the North Coast Region* (Sediment TMDL Implementation Policy).⁶¹

The Sediment TMDL Implementation Policy states that the North Coast Water Board shall address sediment waste discharges on a watershed-specific basis and directs staff to take the following actions to control sediment waste discharges:

1. Rely on the use of existing permitting and enforcement actions. These actions are consistent with the NPS Policy.
2. Rely on the use of existing prohibitions, including any future amendments.
3. Pursue non-regulatory actions, such as Memoranda of Understanding, with other agencies and organizations.
4. Work with local governments and non-profit organizations to develop sediment control strategies, such as grading ordinances.
5. Encourage organizations and individuals to control sediment waste discharges and conduct watershed restoration activities.
6. Focus on public outreach and education.
7. Develop a guidance document on sediment waste discharge control.
8. Develop a sediment TMDL implementation monitoring strategy.

6.1.3 Other Implementation Mechanisms

The basin plan includes policies, plans, prohibitions and implementation tools that apply across the state (chapter 4) and region (chapter 5). Some, but not all, of the key policies and regulatory tools applicable to TMDLs, in addition to those listed in 6.1.1 and 6.1.2, include the Temperature Policy (section 5.3.5), the Nonpoint Source Policy (section 4.23), and Permitting and Enforcement Tools (section 5.1).

⁶¹ North Coast Water Board Resolution No. R1-2004-0087.

6.2 Total Maximum Daily Loads for the North Coast Region

TMDLs for waterbodies in the North Coast Region have been either developed and adopted by the North Coast Water Board as amendments to the Basin Plan or have been established by the United States Environmental Protection Agency (U.S. EPA). In accordance with CWA sections 303(d)(2) and 303(e)(3)(C) and federal regulations at 40 C.F.R. section 130.6(c)(1), the U.S. EPA established TMDLs, and those TMDLs established and adopted as amendments to the Basin Plan by the North Coast Water Board are listed below in Table 6-1.

Watershed pollutants and implementing mechanisms for each of the North Coast Region TMDLs are identified in Table 6-1.. TMDLs that have watershed specific TMDL action plans are described in section 6.3.

Table 6-1: Total Maximum Daily Loads for the North Coast Region including the pollutant and implementing mechanism.

TMDL Project	Pollutant	Implementation
Albion River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/albion_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Big River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/big_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Eel River, North Fork (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_north_fork/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Eel River, Upper Main (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_upper_main/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Eel River, Middle Main (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_middle_main/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Eel River, Middle Fork (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_middle_fork/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Eel River, Lower Main (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_lower_main/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment TMDL Implementation Policy • Temperature Policy

CHAPTER 6. TOTAL MAXIMUM DAILY LOADS AND WATERSHED SPECIFIC ACTION PLANS

TMDL Project	Pollutant	Implementation
Eel River, South Fork (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/eel_river_south_fork/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Eel River Watershed • Sediment Policy • Temperature Policy
Elk River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/)	Sediment	<ul style="list-style-type: none"> • Action Plan for the Upper Elk River Sediment TMDL • Sediment TMDL Implementation Policy
Garcia River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/garcia_river/)	Sediment	<ul style="list-style-type: none"> • Action Plan for the Garcia River Watershed Sediment TMDL • Sediment TMDL Implementation Policy
Gualala River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/gualala_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Klamath River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/)	Dissolved Oxygen; Temperature; Nutrients; Microcystins	<ul style="list-style-type: none"> • Action Plan for the Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in the Klamath River in California and Lost River Implementation Plan • Temperature Policy
Lost River, Upper (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/lost_river_upper/)	Nutrients; Temperature	<ul style="list-style-type: none"> • Action Plan for the Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in the Klamath River in California and Lost River Implementation Plan • Temperature Policy
Lost River, Lower (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/lost_river_lower/)	Nutrients; pH	<ul style="list-style-type: none"> • Action Plan for the Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in the

CHAPTER 6. TOTAL MAXIMUM DAILY LOADS AND WATERSHED SPECIFIC ACTION PLANS

TMDL Project	Pollutant	Implementation
		Klamath River in California and Lost River Implementation Plan <ul style="list-style-type: none"> • Temperature Policy
Mad River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/mad_river/)	Sediment; Turbidity	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Mattole River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/mattole_river/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Mattole River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Navarro River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/navarro_river/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan to Address Elevated Water Temperatures in the Navarro River Watershed • Sediment TMDL Implementation Policy • Temperature Policy
Noyo River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/noyo_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Redwood Creek (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/redwood_creek/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Salmon River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/salmon_river/)	Nutrients; Temperature	<ul style="list-style-type: none"> • Temperature Policy
Scott River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/scott_river/)	Sediment; Temperature	<ul style="list-style-type: none"> • Action Plan for the Scott River Sediment and Temperature Total Maximum Daily Loads • Sediment TMDL Implementation Policy • Temperature Policy

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TMDL Project	Pollutant	Implementation
Shasta River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/shasta_river/)	Dissolved Oxygen; Temperature	<ul style="list-style-type: none"> • Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads • Temperature Policy
Stemple Creek (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/stemple_creek/)	Nutrients; Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Ten Mile River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/ten_mile_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Trinity River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/trinity_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Trinity River, South Fork (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/trinity_river_south_fork/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy
Van Duzen River (https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/vanduzen_river/)	Sediment	<ul style="list-style-type: none"> • Sediment TMDL Implementation Policy

6.3 Watershed Specific Total Maximum Daily Load Action Plans

6.3.1 Action Plan to Address Elevated Water Temperatures in the Eel River Watershed

The U.S. EPA has established Total Maximum Daily Loads (TMDLs) for elevated temperature in the Upper Main Eel, Middle Main Eel, Lower Main Eel, South Fork Eel, North Fork Eel, and Middle Fork Eel River watersheds⁶². All of those temperature TMDLs have assigned temperature load allocations corresponding to solar radiation loads that occur when the riparian vegetation is at full potential growth conditions, with allowances for the effects of natural factors that act to reduce those potential growth conditions. The goal of this Action Plan is to establish actions that achieve those TMDL load allocations. The following actions constitute the program of implementation to achieve the Eel River Watershed Temperature TMDLs and are consistent with the *Policy for the Implementation of the Water Quality Objectives for Temperature*.

Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<u>Timber Harvest Activities on Non-Federal Lands</u> North Coast Water Board	<u>Action</u> North Coast Water Board staff shall make recommendations for additional measures to ensure the TMDL load allocations and water quality objectives for temperature are achieved during the timber harvest review process, as necessary. <u>Timeline</u> Ongoing

⁶² Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury) Total Maximum Daily Loads for Temperature and Sediment (2004), Middle Main Eel River and Tributaries (from Dos Rios to South Fork) Total Maximum Daily Loads for Temperature and Sediment (2005), Lower Eel River Total Maximum Daily Loads for Temperature and Sediment (2007), South Fork Eel River Total Maximum Daily Loads for Sediment and Temperature (1999), North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature (2002), and Middle Fork Eel River Total Maximum Daily Loads for Sediment and Temperature (2003), each contain a problem statement, source analysis, numeric targets, load allocations, linkage analysis, and margin of safety. Please see the individual TMDL documents for more information.

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Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Timber Harvest Activities on Non-Federal Lands</u></p> <p>Parties conducting timber harvest activities that discharge waste or have the potential to discharge waste</p>	<p><u>Action</u> Implement riparian management measures that meet the riparian shade allocations and water quality standards. Where the Forest Practice Rules are not sufficient to meet the TMDL allocations or water quality standards, implement additional measures as directed by North Coast Water Board staff during the timber harvest review process.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>All Activities on USFS Lands</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Implement Order No. R1-2010-0029, <i>Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands in the North Coast Region</i>, and any future revisions, (USFS Waiver of WDRs) as a mechanism for compliance with the water quality objectives for temperature.</p> <p><u>Action</u> North Coast Water Board staff shall make recommendations for additional measures to ensure the water quality objective for temperature is achieved during the project review process, as necessary.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>All Activities on Lands Managed by the USFS</u></p> <p>USFS</p>	<p><u>Action</u> Conduct land management activities in compliance with the USFS Waiver of WDRs and in accordance with project-level recommendations.</p> <p><u>Timeline</u> As required in the USFS Waiver of WDRs.</p>
<p>Agricultural Activities on Non-Federal Lands</p> <p>North Coast Water Board</p>	<p><u>Action</u> Develop and implement the Agricultural Lands Discharge Program as a mechanism for compliance with temperature objectives.</p> <p><u>Timeline</u> Upon adoption</p>

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Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Agricultural Activities on Non-Federal Lands</u></p> <p>Parties conducting activities associated with agriculture that discharge waste or have the potential to discharge waste on nonfederal land, except dairies.</p>	<p><u>Action</u> Implement riparian management measures that meet the riparian shade load allocations and water quality standards.</p> <p><u>Timeline</u> Ongoing</p> <p><u>Action</u> Conduct land management activities in compliance with the Agricultural Lands Discharge Program when adopted.</p> <p><u>Timeline</u> Upon adoption of the Agricultural Lands Discharge Program</p>
<p><u>Road Construction and Maintenance of State Highway Facilities</u></p> <p>State Water Resources Control Board</p> <p>North Coast Water Board</p>	<p><u>Action</u> Implement the NPDES Statewide Stormwater Permit and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans permit).</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Road Construction and Maintenance of State Highway Facilities</u></p> <p>Caltrans</p>	<p><u>Action</u> Conduct road construction, maintenance and associated activities in compliance with the Caltrans permit.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Road Construction and Associated Maintenance on County Lands</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Implement Order No. R1-2013-0004, <i>Waiver of Waste Discharge Requirements and General Water Quality Certification for County Road Management and Activities Conducted Under the Five Counties Salmonid Conservation Program In the Counties of Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity in The North Coast Region</i> (5C Waiver of WDRs), and any future revisions.</p> <p><u>Action</u> In the event that a county does not show intent to implement the 5C Waiver of WDRs, develop WDRs or a conditional waiver of WDRs for that county.</p>

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Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
	<u>Timeline</u> Ongoing
Road Construction and Maintenance on County Lands Humboldt, Mendocino, and Trinity Counties	<u>Action</u> Conduct road construction and maintenance in compliance with the 5C Waiver of WDRs. <u>Timeline</u> Pursuant to the 5C Waiver of WDRs timelines.
<u>Dairy Operations</u> North Coast Water Board	<u>Action</u> Implement temperature allocations through the Water Quality Compliance Program for Dairies & Concentrated Animal Feeding Operations (Dairy Program), and any future revisions. <u>Timeline</u> Ongoing
<u>Dairy Operations</u> Dairy operators	<u>Action</u> Conduct land management activities in compliance with the Dairy Program. <u>Timeline</u> Ongoing
<u>Dredge and Fill Activities in Waters of the State</u> North Coast Water Board	<u>Action</u> Incorporate measures to meet the temperature allocations in 401 water quality certifications. <u>Timeline</u> Ongoing
<u>Waste Discharge Requirement Program</u> North Coast Water Board	<u>Action</u> Incorporate measures to meet the temperature allocations and water quality objectives for temperature in Waste Discharge Requirements and Waivers thereof. <u>Timeline</u> Ongoing

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Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Work with other agencies and non-governmental organizations to support off-stream storage projects for water diverters currently diverting directly from streams during summer. Work with other agencies and non-governmental organizations to streamline the permitting process for conversion of on-stream to off-stream storage.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>Water users</p>	<p><u>Action</u> The North Coast Water Board encourages all water users to implement water conservation practices and develop off-stream storage facilities to minimize water diversions during low flow periods.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Pursue instream flow studies, including the following actions: Work with other agencies and non-governmental organizations to support instream flow studies to: (1) quantify flows necessary for beneficial use support, (2) quantify flow impacts to assist outreach and education efforts, or (3) identify opportunities to increase summer low flows. Coordinate with the California Department of Fish and Wildlife on the development, methodologies, and any criteria relevant to instream flow studies. Consider all sources of water, including headwaters, groundwater, and waters flowing in subterranean streams.</p> <p><u>Timeline</u> Until complete</p>

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Table 6-2: Actions to Address Temperature Impairments in the Eel River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Support third-party efforts to address temperature related concerns, including: Education of water users on the importance of water conservation efforts, Education of water users on water conservation practices and opportunities, Assistance for water users in the implementation of water conservation practices, Restoration of riparian vegetation, Other efforts that address water temperature-related concerns.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Continue to coordinate with the State Water Board's Division of Water Rights by participating in the water right application and petition process, providing monitoring recommendations, conducting joint inspections as appropriate, submitting data in support of 401 certifications related to water diversions and/or facilities regulated by the FERC, participating in instream flow studies, participating in proceedings related to instream flow, and participating by any other appropriate means to help ensure that the terms of water right permits and licenses are consistent with the intrastate water quality objective for temperature.</p> <p><u>Timeline</u> Ongoing</p>

6.3.2 Action Plan For The Upper Elk River Sediment TMDL

The Elk River Watershed is located in Humboldt County in northern California and drains into Humboldt Bay, south of the City of Eureka. Due to excessive sedimentation, the entire 58.3 square mile (37,310 acres) Elk River Watershed was placed on the Impaired Waters List for Section 303(d) of the Clean Water Act in 1998. This sediment TMDL addresses impairments in the 44.2 square mile (28,288 acres) Upper Elk River Watershed, which is predominantly timberland and includes impacted reaches wherein the most sediment has been stored and subsequent effects observed. The Program of Implementation described below includes nonregulatory actions that are designed to address sedimentation throughout the watershed. The Action Plan for the Upper Elk River Sediment TMDL (hereinafter known as the TMDL Action Plan) does not establish sediment load allocations

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for landuse in the Martin Slough or Lower Elk River West subwatersheds, nor for activities in the Lower Elk River subwatershed that are downstream of Berta Road.

The TMDL Action Plan includes a phased total maximum daily load (TMDL) for sediment and describes the implementation actions necessary to attain water quality standards in the Upper Elk River Watershed. The goal of the TMDL Action Plan is to achieve sediment related water quality standards, including the protection of the beneficial uses of water in the upper watershed and prevention of nuisance conditions. The TMDL Action Plan establishes the sediment load consistent with current conditions in the impacted reaches, identifies a process for assessing and implementing necessary and feasible remediation and restoration actions, and describes a program of implementation to be considered and incorporated into regulatory and non-regulatory actions of the North Coast Water Board and other stewardship partners in the watershed.

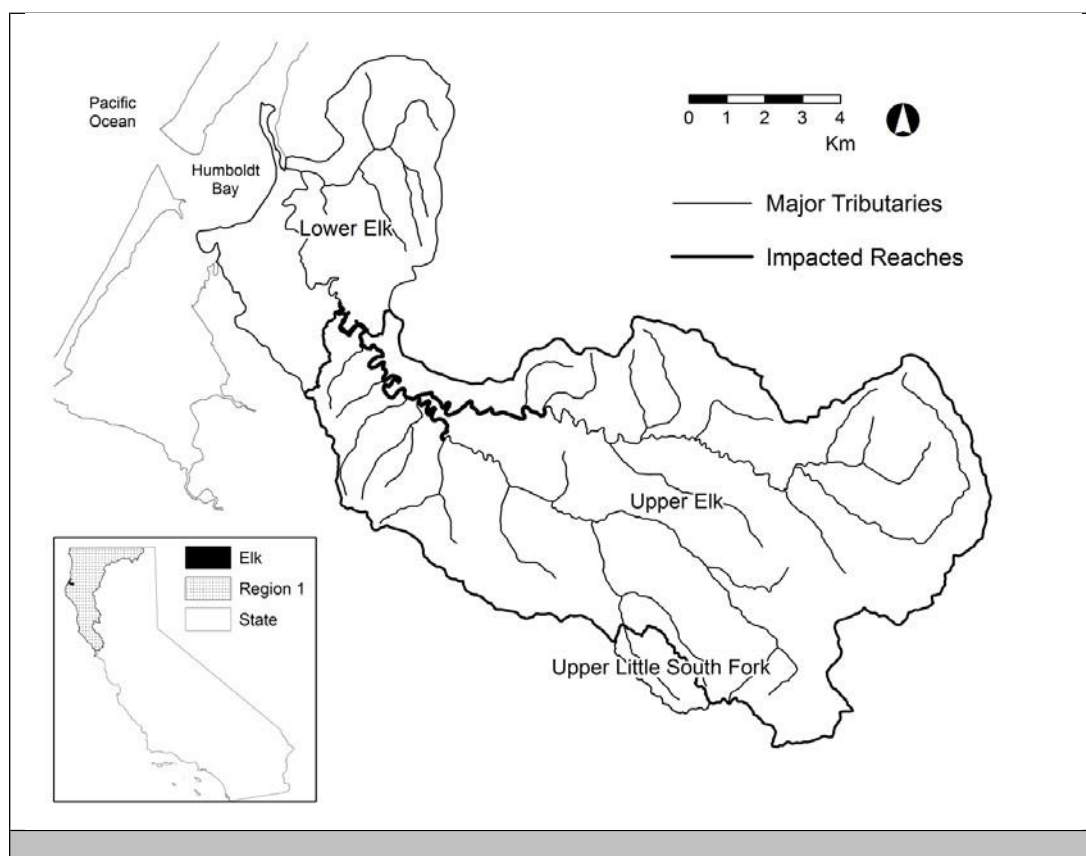


Figure 6-1: Elk River Watershed Delineation

6.3.2.1 Problem Statement

Site specific assessment of water quality conditions in the Upper Elk River Watershed confirm that sediment discharges from timberlands in the upper watershed and sedimentation in the impacted reaches, combining with other natural (e.g., tectonics, geology, soil characteristics, geomorphology, climate and vegetation) and anthropogenic (e.g., pre-Forest Practices Act logging, ranching, farming, roads, and residential

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development) factors exceed the water quality objectives for sediment, suspended material, settleable matter, and turbidity and result in adverse impact to several beneficial uses, including domestic water supplies (MUN), agricultural water supplies (AGR), cold water habitat (COLD); spawning, reproduction and early development (SPWN); rare, threatened, or endangered species (RARE), and recreation (REC-1 and REC-2). Sedimentation in the impacted reaches also has resulted in conditions of nuisance, including increased rates and depth of annual flooding and loss of property, use of property, access to property, and risk to human health and welfare. The impacted reach extends from the confluence of Brown's Gulch on the North Fork Elk and Tom Gulch on the South Fork Elk to the mainstem Elk River at Berta Road and is contained within the delineated boundaries of the Upper Elk River Watershed.

6.3.2.2 *Source Analysis*

Multiple natural and anthropogenic factors influence the behavior of sediment in the Elk River Watershed. Table 6-3 summarizes the estimated sediment loads, organized by source category and analysis time period. The presented estimates represent the data collection and assessment efforts of multiple federal, state, private and nonprofit entities over the course of more than 10 years. The estimates combine the results of numerous Elk River specific studies, which constitute a rich and abundant dataset. Nonetheless, there is inherent uncertainty in the estimates, derived from necessary assumptions and conservative margins of safety. The estimates provide an adequate and reasonable basis for establishing a TMDL and load allocations. An adaptive management framework allows for adjustments to the program of implementation, as new data become available. Primary natural factors include: tectonics, geology, topography, geomorphology, climate and vegetation. Geological features are an especially important factor in sediment production in the Upper Elk River, which is dominated by young, fine-grained, erodible geology. Primary anthropogenic or land use-related factors include: timber harvest, yarding, road building and use, and legacy practices (e.g., pre-Forest Practice Rules). The interaction between inherent watershed characteristics, types of management practices, and timing of stochastic events such as earthquakes or large storm events, influence the magnitude and timing of sediment production. Increased sediment production results from greater incidence of landsliding, surface and gully erosion, and increases in channel erosion from increased peak flows and higher runoff.

Sediment transported from the upper subwatersheds has deposited in low gradient channel and floodplain reaches, impacting residential and agricultural communities with increased incidence of overbank flooding, defined as nuisance conditions. Ongoing sediment loading continues to result in aggradation of fine sediment, encroachment of riparian vegetation, and impairment of beneficial uses, though the total volumes of delivered sediment have decreased since the 1988-1997 time period. The causes of reduced sediment loading have not been clearly established. But, improvements in management practices in the 2004-2011 period, as well as smaller magnitude peak flow events and a limited number of relatively wet years in this period, likely play a role. Cross sectional changes observed over the past three decades starting in 1988 indicate an estimated 640,000 cubic yards of sediment have accumulated in the impacted reaches. An estimated 25% of the annual sediment inflow to the impacted reaches causes aggradation and further worsens nuisance conditions.

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The sediment source analysis identifies the key sediment source categories that produce sediment in the Upper Elk River Watershed. Sediment discharges resulting from timber harvest and other land- management activities in the most recent analysis time period (2004-2011) are (in order of significance): in-channel sources (headward channel incision, bank erosion, and streamside landslides), discharges from existing land use-related sediment discharge sites, other road-related discharges, and harvest-related discharges.

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Table 6-3: Summary of Upper Elk River volumetric loading (yd³·mi⁻²·yr⁻¹) by sediment source category and analysis time period

Sediment Source Category		1955 -1966	1967 -1974	1975 -1987	1988 -1997	1998 -2000	2001 -2003	2004 -2011
Anthropogenic	In-Channel: Low Order Channel Incision	67	23	14	21	32	12	14
	In-Channel: Management-Related Bank Erosion & Streamside Landslides	186	141	54	219	240	240	160
	Road-Related Landslides	99	29	15	307	3	20	25
	Road Surface Erosion	52	78	87	137	55	56	22
	Land Use-related Sediment Discharge Sites	30	60	80	65	39	73	39
Anthropogenic	Post-Treatment Sediment Discharge Sites	0	0	0	0	13	4	24
	Skid Trails	4	12	11	12	26	15	15
	Open Slope Landslides	189	82	6	201	118	51	5
	Harvest Surface Erosion	2	6	2	5	6	5	4
	Anthropogenic Loading	629	431	268	966	531	476	308
	Natural Loading	152	132	93	167	176	176	144
	Total Loading	781	563	360	1,133	707	652	452

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6.3.2.3 Water Quality Indicators

Water quality indicators and associated numeric targets are not independently enforceable and are designed to measure progress towards attaining water quality objectives for suspended material, settleable material, turbidity and sediment. The water quality indicators are divided into hillslope and instream, as identified in Tables 6-4 and 6-5, respectively. The hillslope indicators and numeric targets in Table 6-4 are designed to inform Board actions and can be incorporated into orders, as appropriate and to the maximum extent feasible. The instream water quality indicators are designed to help assess the overall effectiveness of the program of implementation and confirm progress towards attainment of applicable water quality standards.

Attainment of water quality objectives is partly dependent on the control of sediment discharges from the Upper Elk River Watershed to minimize increased sediment production and other controllable water quality factors (e.g., altered hydrology and reduction in large woody debris recruitment trees).

Table 6-4: Hillslope Water Quality Indicators and Numeric Targets

Table 6 - Hillslope Water Quality Indicators and Numeric Targets		
Indicator	Numeric Target	Associated Area
Hydrologic connectivity of roads to watercourses	100% of road segments hydrologically disconnected from watercourses	All roads
Sediment delivery due to surface erosion from roads	Decreasing road surface erosion	
Sediment delivery due to road- related landslides	Decrease in sediment delivery from new and reactivated road-related	
Common Harvest-Related Indicators		
Sediment delivery due to surface erosion from harvest areas	100% of harvest areas have ground cover sufficient to prevent surface erosion	All harvest areas
Sediment delivery from open slope landslides due to harvest-related activities	Decrease in sediment delivery from new and reactivated open-slope landslides	All open slopes
Sediment delivery from deep seated landslides due to harvest- related activities	Zero increase in discharge from deep- seated landslides due to management- related activities	All deep-seated landslides

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Indicator	Numeric Target	Associated Area
Common Management Discharge Site Indicators		
New management discharge sites	No new management discharge sites created	Class I, II, and III watercourses
Specific Upper Elk River Watershed Indicators		
Headward incision in low order channels	Zero increase in the existing drainage network	Class II/III catchments
Peak flows	Less than 10% increase in peak flows in 10 years related to timber harvest	Class II/III catchments
Channels with actively eroding banks	Decreasing length of channel with actively eroding banks	Class I, II, and III watercourses
Characteristics of riparian zones (i.e., 300 feet on either side of the channel) associated with Class I and II watercourses	Improvement in the quality/health of the riparian stand so as to promote 1) delivery of wood to channels, 2) slope stability, and 3) ground cover	Class I and II watercourses
Characteristics of riparian zones (i.e., 150 feet on either side of the channel) associated with Class III watercourses	Improvement in the quality/health of the riparian stand so as to promote 1) delivery of wood to channels, 2) slope stability, and 3) ground cover	Class III watercourses

Table 6-4: Instream Water Quality Indicators and Numeric Targets

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Instream Indicator	Numeric Target	Associated Area
Bankfull channel capacity	Channel cross-sectional area sufficient to contain the historic bankfull discharges: Upper Mainstem = 2,250 cfs (for drainage area of 43 mi ²) Lower North Fork, = 1,170 cfs (for drainage area of 22.5 mi ²) Lower South Fork = 1,015 cfs (for drainage area of 19.5 mi ²)	Impacted reaches near the confluence of North and South Forks Elk River, with target discharge scaled to drainage area at measurement location
Chronic turbidity	Clearing of turbidity between storms to a level sufficient for salmonid feeding and surface water pumping for domestic and agricultural water supplies	Salmonid feeding— watershed-wide historic range of salmonids Water supplies— Impacted reaches

6.3.2.4 Sediment TMDL and Load Allocation, including Margin of Safety and Consideration of Seasonal Variation

TMDLs must be established at levels necessary to attain and maintain the applicable water quality standards with seasonal variations and a margin of safety (MOS) (40 CFR Part 130.7(c)(1).) The TMDL represents the maximum amount of a pollutant that can be discharged to a waterbody, taking into account critical conditions of stream flow, loading, and water quality parameters. The TMDL is equivalent to the loading capacity of the waterbody for the pollutant in question.

The Upper Elk River Sediment TMDL is set equal to the loading capacity of the waterbody. The loading capacity of the Upper Elk River Watershed is defined as the total sediment load (natural and management-related) that can be discharged into the Upper Elk River and its tributaries without impacting beneficial uses of water, causing an exceedance of water quality objectives, reducing the quality of high quality water, or creating nuisance conditions. Because capacity for sediment is limited by the ongoing aggradation in the impacted reaches, the loading capacity for additional sediment is defined as zero until the capacity of the impacted reaches can be expanded.

All the sediment delivered to the stream channels in the Upper Elk River Watershed is attributed to management-related nonpoint source pollution and natural background. Due

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to the lack of sediment loading capacity in the impacted reaches, the nonpoint source load allocation is defined as zero. This approach incorporates a conservative, implicit MOS and includes seasonal variation of sediment production through estimating sediment loads on an annual time step. The zero load allocation is necessarily conceptual since, using current technology and techniques, no amount of land use restriction can physically result in zero loading of nonpoint source sediment (i.e., the control of all natural and anthropogenic sediment delivery from the tributary system). This regulatory loading capacity will guide the program of implementation and will be maintained until the sediment loading capacity of the impacted reaches has been expanded. The zero load allocation does not constitute an effluent limitation or a waste load allocation, and the Board has discretion on how to implement it in WDRs, waivers or other actions to reduce and eliminate waste discharges. Once the loading capacity has been expanded, the North Coast Water Board can reevaluate the load allocation and establish a second phase of the TMDL, as appropriate.

6.3.2.5 Watershed Efforts

Throughout the Elk River Watershed, many individuals, groups, and agencies have been working to assess, enhance, and restore beneficial uses and assess, abate, and prevent nuisance conditions related to sedimentation and flooding. These groups include, but are not limited to the North Coast Water Board, State Water Resources Control Board, Bureau of Land Management, National Oceanographic and Atmospheric Administration, U.S. Fish and Wildlife Service, USDA Forest Service Redwood Sciences Laboratory and National Resources Conservation Service, U.C. Cooperative Extension, California Department of Fish and Wildlife, California Department of Forestry and Fire Protection, Board of Forestry, California Coastal Conservancy, Humboldt County Board of Supervisors and Planning Department, Redwood Community Action Agency, Salmon Forever, Friends of Elk River, CalTrout, Elk River Residents Association, Humboldt Redwood Company, Green Diamond Resource Company, individual residents and landowners, and other watershed stakeholders.

In February 2012, the North Coast Water Board, in coordination with Redwood Community Action Agency, held a Restoration Summit to explore strategies for restoration of the low gradient reaches of Elk River impacted by stored sediment deposits. The primary purpose of this summit was to convene affected landowners, resource agency staff, technical experts, potential funders, and diverse stakeholders to discuss approaches to addressing long-standing channel restoration, excess sediment loads, nuisance flooding, and related issues in the impacted reaches of the Elk River Watershed. A conclusion of the Restoration Summit was to pursue funding for full-scale data collection and sediment and hydrodynamic modeling from the top of the impacted reaches to Humboldt Bay, so as to characterize existing conditions and inform sediment remediation and channel restoration activities necessary to prevent nuisance and recover beneficial uses.

In 2014, the State Water Resources Control Board executed a contract with CalTrout, relying primarily on funds from the State's Cleanup and Abatement Account, but including contributions from the California Coastal Conservancy and Humboldt Redwood Company, to conduct the Elk River Recovery Assessment. The Elk River Recovery Assessment is designed to assess the fate and transport of fine sediment from the top of

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the impacted reaches downstream to Humboldt Bay. The Elk River Recovery Assessment requires the collection of sediment and hydraulic data, which is used to populate full scale hydrodynamic and sediment transport models within which several different remediation and restoration scenarios can be tested. The Elk River Recovery Assessment will provide the feasibility assessment from which a remediation action plan can be developed in coordination with the Elk River Watershed Stewardship Program.

In 2015, Humboldt County was awarded Clean Water Act Section 319(h) grant funds to develop and initiate an Elk River Watershed Stewardship Program through which to develop consensus-based recommendations with respect to health and safety, sediment remediation and habitat restoration, and science and coordinated monitoring needs in the Elk River Watershed. The Elk River Watershed Stewardship Program developed under this contract will provide the framework within which to implement non-regulatory components of phase 1 of the TMDL.

6.3.2.6 Program of Implementation

The Program of Implementation identifies a combination of regulatory and non-regulatory actions that will lead to the attainment of water quality objectives, recovery of beneficial uses, protection of high quality waters, and prevention of nuisance conditions in the Upper Elk River Watershed. Implementation of phase 1 requires control of all existing and potential future sediment sources in the upper watershed while the Elk River Recovery Assessment is completed and the Elk River Watershed Stewardship Program is developed, initiated, and successfully results in the activities necessary to expand the sediment loading capacity of the impacted reaches and abate nuisance conditions. The North Coast Water Board can recalculate, as appropriate, the sediment TMDL following remediation and restoration of the impacted reaches, by assessing the expanded capacity of the watershed to transport sediment and water more normally. Normal sediment and water transport occurs when 1.5 to 2-year flood events are contained within the bankfull stream channel. As appropriate, the North Coast Water Board may modify the program of implementation for a second phase of the TMDL Action Plan if the sediment TMDL is recalculated.

There are three main components of the program of implementation associated with phase 1 of the TMDL Action Plan, including:

- a. Waste Discharge Requirements (WDR) or waiver of WDRs: Applicable regulatory programs to reduce sediment loads from new and existing sediment sources on lands in the Upper Elk River Watershed, so as to reduce sediment loading toward the load allocation;
- b. Elk River Recovery Assessment: A non-regulatory feasibility assessment of the sediment remediation and channel restoration activities, which in combination with sediment load reductions, are necessary to improve hydraulic and sediment transport in the Elk River Watershed; and
- c. Watershed Stewardship Program: A non-regulatory program under which implementation of health and safety projects, remediation and restoration activities, and science and coordinated monitoring serves to support beneficial use enhancement and a trajectory of watershed recovery, including abatement of nuisance flooding and an

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expansion of sediment loading capacity.

Implementation actions associated with each of the three components of the program of implementation are identified in Table 6-6.

WDRs: WDRs are the primary regulatory mechanism utilized by the North Coast Water Board to control the nonpoint source pollution resulting from past and ongoing timber harvesting activities, the dominant land use in Upper Elk River Watershed. Existing adverse cumulative impacts from current and past land management practices combined with watershed characteristics (such as sensitive geology and altered hydrologic conditions) require that additional actions be taken beyond those currently being implemented in the Upper Elk River Watershed. Updated management actions are necessary to prevent continued impact to beneficial uses and contributions to downstream nuisance conditions that result from ongoing timberland management. The WDRs will consider the unique watershed factors that influence the discharge of sediment so as to properly update management practices and better manage watershed effects.

The North Coast Water Board has discretion in developing WDRs that can allow individual dischargers to tailor a compliance strategy. Humboldt Redwood Company (HRC) is the largest landowner, with 79 percent ownership of the Upper Elk River Watershed. In 2016, the North Coast Water Board will consider adoption of WDRs to address waste discharges and other controllable water quality factors on lands within the Upper Elk River Watershed owned by HRC. The WDRs shall provide for implementation of rigorous best management practices (BMPs) with variation according to the sediment loading risk of individual subwatersheds.

Other landowners include Green Diamond Resource Company (GDRC), Bureau of Land Management (BLM), and individual non-industrial timberland owners. As part of its ownership WDRs for timber harvesting and roads, GDRC has a South Fork Elk Management Plan. (Order No. R1-2012-0087 Waste Discharge Requirements for Discharges Related to Green Diamond Resource Company's Forest Management Activities Conducted within the Area Covered by Its Aquatic Habitat Conservation Plan in the North Coast Region, Humboldt and Del Norte Counties). The South Fork Elk Management Plan shall be modified to be consistent with the TMDL Action Plan and available for North Coast Water Board consideration in 2016. The BLM manages the Headwaters Forest Reserve comprising about 7,472 acres of old growth coast redwood as part of the National Landscape Conservation System. The 2004 Management Plan for the Headwaters Forest Reserve focuses on restoration, research, and recreation/education and is being updated. BLM management of the Headwaters Forest generally provides benefits to water quality in the Elk River Watershed. Any BLM projects expected to discharge sediment can be enrolled and regulated as a Category B project under the USFS Waiver. (Order No. R1- 2015-0021 Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands.) Non-industrial Timber Management Plan (NTMP) owners must enroll under the General NTMP WDRs in Tier B (Order No. R1- 2013-0005 General Waste Discharge Requirements for Discharges for Timber Operations on NTMPs). Tier B requires that a landowner submit an erosion control plan (ECP) for their entire NTMP area. Other timberland owners may enroll individual

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THPs under the General Timber WDRs (Order No. 2004-0030) with any additional conditions identified during THP review to make consistent with the TMDL Action Plan.

Elk River Recovery Assessment: The State Water Resources Control Board executed a contract with CalTrout in 2014 to conduct full scale sediment and hydrodynamic modeling from the top of the impacted reach to the river's outlet at Humboldt Bay, with a final deliverable due in 2017. This is a non-regulatory assessment of the feasibility of improving conditions in the impacted reaches of the Upper Elk River Watershed. The final assessment report is expected to result in the technical foundation for a remediation action plan by which to initiate recovery of ecosystem functions and beneficial uses in the Elk River and abate nuisance conditions. Potential recovery actions may include dredging, new channel construction, off-channel sediment detention basins, levee construction or modification, vegetation management, infrastructure improvements, creation of inset floodplains, high flow channels, and placement of instream large woody debris. Pilot remediation permitting and implementation projects are planned for 2016-2018. Full scale remediation and restoration permitting will proceed with larger-scale actions to be initiated in approximately 2020. Monitoring and maintenance is anticipated for an extended period (e.g., ten to twenty years) following completion of remediation efforts.

Watershed Stewardship Program: This is a non-regulatory, participatory program that engages residents, community members, scientists, land owners, land managers, and regulatory agencies in developing a collaborative planning process that seeks to enhance conditions in the Elk River Watershed. The Elk River Watershed Stewardship Program will work to accomplish the following goals:

- a. Seek common ground among diverse participants.
- b. Identify strategies and solutions to:
 - i. Improve the hydrologic, water quality, and habitat conditions of Elk River;
 - ii. Reduce nuisance flooding and improve public transportation routes during high water conditions; and
 - iii. Improve residential and agricultural water supplies.
- c. Promote coordinated science and monitoring.

In 2016, a steering committee comprised of Humboldt County, University of California Cooperative Extension, Natural Resources Conservations Service, CalTrout, and the North Coast Water Board will initiate the Elk River Watershed Stewardship Program. Initial program funding is provided by Clean Water Act Section 319(h) grant funds from the U.S. EPA and will support the stewardship efforts through 2018.

Table 6-5: Upper Elk River Sediment TMDL Implementation Actions⁶³

⁶³ The zero-load allocation does not constitute an effluent limitation or a waste load allocation, and the Board has discretion on how to implement it in WDRs, waivers or other actions to reduce and eliminate waste discharges.

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Topic	Responsible Parties	Actions
Sediment Source Control	Humboldt Redwood Company	Humboldt Redwood Company shall implement its revised WDRs adopted by the North Coast Water Board to implement phase 1 of the Upper Elk River Sediment TMDL and a zero load allocation.
Sediment Source Control	Green Diamond Resource Company	Green Diamond Resource Company shall implement its South Fork Elk management plan including any revisions approved by the North Coast Water Board to implement phase 1 of the Upper Elk River Sediment TMDL and a zero sediment load allocation.
Sediment Source Control	Non-Industrial Timberland Owners	Prior to any timberland management activities, non-industrial timberland owners shall enroll under the General NTMP WDR in Tier B (Order No. R1-2013-0005 General Waste Discharge Requirements for Discharges for Timber Operations on NTMPs) or a future Order that replaces Order No. R1-2013-0005.
Sediment Source Control	Other Timberland Owners	For other timber harvest plans, landowners shall enroll individual THPs under the General Timber WDRs (Order No. 2004-0030) or a future Order that replaces Order No. R1-2004-0030 and incorporate any additional conditions identified during the timber review process as necessary to be consistent with the TMDL Action Plan.
Sediment Source Control	Bureau of Land Management	The Bureau of Land Management shall request enrollment of any projects with potential sediment discharges under the U.S. Forest Service Waiver (Order No. R1-2015-0021) or a future Order that replaces Order No. R1-2015-0021.

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Topic	Responsible Parties	Actions
Sediment Remediation	CalTrout	By 2017, CalTrout will produce a final report detailing the results of full-scale sediment and hydrodynamic modeling, including feasible remediation and restoration activities sufficient to achieve water quality standards and return the watershed to a trajectory of recovery.
Watershed Stewardship	Humboldt County, the Steering Committee, and the Watershed Stewardship Program	By 2016, in coordination with a steering committee, Humboldt County will initiate a Watershed Stewardship Program for the Elk River Watershed in conformance with the 319(h) grant contract, including establishment of: a Health and Safety workgroup responsible for developing recommendations appropriate for resolving water supply, flooding, and road access issues; a Science and Coordinated Monitoring workgroup responsible for developing recommendations appropriate for improving the effectiveness of water quality, sediment and flow monitoring efforts throughout the watershed; a Sediment Remediation workgroup responsible for developing recommendations appropriate for remediating instream stored sediment and improving floodwater conveyance, sediment transport, and ecosystem function. Final reports documenting the workgroup's

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Topic	Responsible Parties	Actions
TMDL and Watershed Stewardship Effectiveness	North Coast Water Board	By 2021, the North Coast Water Board shall evaluate the available information to assess the degree to which the efforts of the Watershed Stewardship Program are making sufficient progress towards achievement of health and safety, coordinated monitoring, and sediment remediation improvements. By 2026, the North Coast Water Board shall evaluate the available information to assess the degree to which recommended health and safety, coordinated monitoring, and sediment remediation improvements have been achieved. By 2031, the North Coast Water Board shall evaluate the available information to assess the degree to which water quality objectives are attained and beneficial uses are restored throughout the watershed, and nuisance flooding conditions are abated.
TMDL and Watershed Stewardship Effectiveness	North Coast Water Board	By 2031 or upon attainment of water quality objectives, the North Coast Water Board shall re-evaluate the sediment loading capacity and load allocation for the Upper Elk River Watershed and revise accordingly.

6.3.2.7 Monitoring and Adaptive Management

The Program of Implementation relies on coordinated monitoring and adaptive management as the basis for tracking trends, updating scientific understanding, and modifying implementation actions over time.

The North Coast Water Board has identified four primary goals for near and long-term monitoring in the Elk River: (1) evaluate compliance with WDR/waiver requirements and verify that the provisions of the WDRs are being implemented as designed and permitted; (2) evaluate the effectiveness of management measures, management modifications, and remediation efforts aimed at reducing sediment loads and improving conditions in the impacted reaches; (3) track whether conditions are trending toward numeric targets, water quality objectives, and beneficial use support via the Watershed Stewardship Program; and (4) inform when and how to reevaluate the loading capacity.

A combination of monitoring resources is anticipated to achieve these goals. The WDRs will require monitoring and reporting from the landowners in the Upper Elk River Watershed. The Elk River Recovery Assessment will provide reach-scale targets defining

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channel and habitat conditions. In addition, pilot remediation projects will be implemented as part of the Elk River Recovery Assessment, including effectiveness monitoring to assess which techniques should be brought full-scale. Finally, the Science and Coordinated Monitoring workgroup of the Watershed Stewardship Program will recommend monitoring and special studies as necessary to address the resource protection goals of the group and answer specific questions.

North Coast Water Board staff will report to the North Coast Water Board annually on the status and progress of implementation activities. Approximately five years after adoption, North Coast Water Board staff will conduct a formal assessment of the effectiveness of the implementation plan and make any necessary revisions to this TMDL Action Plan. This includes a review of the sediment source analysis for the Upper Elk River, sediment deposition in the impacted reach and Lower Elk River, and the need for a Lower Elk River sediment TMDL, using Recovery Assessment tools and other available data, as appropriate.

During reassessment, the North Coast Water Board will consider how effective the requirements of the TMDL program of implementation are at meeting the TMDL, achieving water quality objectives, and protecting the beneficial uses of water in the Upper Elk River Watershed. The success of the TMDL will be assessed based on water quality trends in the Upper Elk River Watershed, particularly the attainment of water quality standards in the impacted reach. Ultimately success is achieved when nuisance conditions are abated, and beneficial uses are supported.

6.3.3 Action Plan for The Garcia River Watershed Sediment TMDL

Note: The “*Action Plan for the Garcia River Watershed Sediment TMDL*” was approved by the North Coast Regional Water Quality Control Board, the State Water Resources Control Board, and the Office of Administrative Law under the more lengthy title of the “*Garcia River Watershed Water Quality Attainment Action Plan for Sediment.*”

The Garcia River Watershed comprises approximately 73,223 acres in southwestern Mendocino County and discharges to the Pacific Ocean. In 1996, the State of California identified the Garcia River as a high-priority waterbody according to the requirements in Section 303(d) of the federal Clean Water Act (CWA). Section 303(d)(1)(A) of the CWA requires that states list those waters within its boundaries for which existing management practices are not sufficient to achieve water quality standards. The Garcia River was identified as a high-priority waterbody due to excessive sedimentation. Accelerated erosion from land use practices and other causes was identified as affecting the migration, spawning, reproduction, and early development of cold water fish such as coho salmon and steelhead trout. When the Garcia River was designated a high-priority waterbody under the requirements of the CWA, the development of a Total Maximum Daily Load (TMDL) for the river became necessary.

As a result of the designation of the Garcia River as a high-priority waterbody under the guidelines of the CWA, landowners, land managers, resource protection agencies, and interested members of the public provided input in the preparation of the *Garcia River Watershed Water Quality Attainment Strategy for Sediment* (1997) (Strategy). The Strategy has been revised and renamed to reflect its role as a supporting document to a

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Basin Plan amendment and is now known as the *Reference Document for the Garcia River Watershed Water Quality Attainment Action Plan for Sediment* (Reference Document). The Reference Document and the Strategy are staff-level tools for landowners; land managers; interested public; and state, local and federal resource protection agency personnel to use as an aid for developing and implementing plans to reduce sediment delivery to the Garcia River and its tributaries. It also is useful for providing additional detail about the concepts that follow. It is a planning document that should be revised or updated over time as factors affecting sediment conditions are better understood. The following Action Plan describes the approach of the North Coast Water Board to achieve sedimentation reduction and attain beneficial uses in the Garcia River Watershed and serves as a phased TMDL, implementation plan, and monitoring plan for the Garcia River Watershed. As a phased TMDL, it will be updated and revised, through Basin Plan amendments, based on new information gathered by North Coast Water Board staff and/or submitted by landowners, other agencies, academic institutions and the public that provides an improved assessment of conditions in the Garcia River Watershed.

6.3.3.1 Problem Statement

The Garcia River and its tributaries have experienced a reduction in the quality and amount of instream habitat that is capable of fully supporting the beneficial use of a cold water fishery, due to increased sedimentation. This has resulted in a reduction in the stocks of coho salmon and steelhead trout. The acceleration of sediment delivery in the Garcia River Watershed due to land management activities has resulted in the loss or reduction of pools necessary for salmonid rearing and the loss or degradation of potential spawning gravel. In addition, the loss or reduction of instream channel structure in the Garcia River Watershed due to land management activities has contributed to this habitat loss or reduction.

6.3.3.2 Numeric Targets

The Numeric Targets, as derived from the scientific literature, focus on the elimination of sediment as a pollutant of concern, and provide instream water quality goals for restoring the cold water fishery habitat. The Numeric Targets represent the desired future condition of the watershed, and are intended to be consistent with existing water quality objectives and beneficial uses, but are not themselves enforceable. The Numeric Targets will be revised through Basin Plan amendments if additional site-specific data for the watershed or additional research support the need for revision. They are expected to be attained throughout the watershed by the year 2049. Table 6-7 provides the Numeric Targets for the Garcia River Watershed.

6.3.3.3 Source Analysis

The analysis of sediment sources is divided into three components: mass wasting (primarily landslides), fluvial erosion (primarily from gullies), and surface erosion (primarily from rills and sheetwash). For each of these categories, data was reviewed to estimate the sediment delivery rate associated with natural background, roads (including but not limited to private, public, rural residential and skid trails), timber harvest units, and agricultural operations. Aerial photograph interpretation and road density data analysis were used to estimate the existing rates of sediment delivery from the above sources and

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from natural background, where the data was sufficient to do so. The estimates are contained in Table 6-8. Based on the existing data, at a minimum, the Garcia River Watershed produced an average of 1,380 tons of sediment per square mile per year as measured from 1956 to 1996.

6.3.3.4 Loading Capacity Calculation

Data from the Garcia River Watershed were compared to those from other north coast watersheds with similar physical, climatic, and geologic characteristics to the Garcia River Watershed. In particular, data from the North and South Forks of Caspar Creek, also located in western Mendocino County, were used to estimate the reduction in sediment loading needed to achieve the desired future condition in the Garcia River. South Fork Caspar Creek was heavily logged by ground-based equipment (tractors) up until the 1970s and is reported by Pacific Watershed Associates (1997) to produce 1,420 tons/mi²/yr of sediment. North Fork Caspar Creek, on the other hand, received very little tractor logging up through the 1970s and is reported by Pacific Watershed Associates (1997) to produce 680 tons/mi²/yr of sediment. The U.S. Environmental Protection Agency Region IX (U.S. EPA) promulgated a TMDL for the Garcia River on March 16, 1998. In it, U.S. EPA assumes that the condition of South Fork Caspar Creek is comparable to the existing condition of the Garcia River watershed and that North Fork Caspar Creek represents a reference for the desired future condition of the Garcia River Watershed, a condition similar to that which existed to the steep decline in salmonid populations. As a result, a reduction in sediment delivery of 52 percent is identified as appropriate to achieve the desired future conditions in the Garcia River Watershed $[(1420-680)/1420=0.52]$. Applying a margin of safety of 8 percent to account for uncertainties in the data and differences between the Garcia River Watershed and the Caspar Creek watershed, an overall reduction in sediment loading of 60 percent is established. (Garcia River Sediment Total Maximum Daily Load, U.S. EPA, Region IX, March 16, 1998).

Table 6-6: Numeric Targets for the Garcia River Watershed

PARAMETER	NUMERIC TARGET
Migration barriers on Class I watercourses ⁶⁴	Zero human-caused barriers

⁶⁴ Class I watercourses are watercourses that contain domestic water supplies, including springs, on site and/or within 100 feet downstream, or have fish always or seasonally present onsite, or contain habitat to sustain fish migration and spawning. Class I watercourses include historically fish-bearing watercourses.

Class II watercourses are watercourses that have fish always or seasonally present offsite within 1000 feet downstream, or contain aquatic habitat for non-fish aquatic species. Class II watercourses do not include Class III watercourses that are directly tributary to Class I watercourses.

Class III watercourses are watercourses that do not have aquatic life present, but show evidence of being capable of sediment transport to Class I and II watercourses under normal high flow conditions during and after completion of land management activities.

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PARAMETER	NUMERIC TARGET
Embeddedness on Class I watercourses	Improving trend ⁶⁵
Percent fines < 0.85 mm on Class I watercourses	<14 percent
Percent fines < 6.5 mm on Class I watercourses	<30 percent
Primary pool frequency in Class I watercourses ⁶⁶	Primary pools covering 40 percent of the length of the watercourse
V* in 3rd order streams with slopes between 1 percent and 4 percent ⁶⁷	<0.21 (mean) <0.45 (max)
Median particle size diameter (d ₅₀) in 3rd order stream with slopes between 1 percent and 4 percent	>69 mm (mean) >37 mm (min)
Large woody debris in Class I , II, and III watercourses	Improving trend ⁶⁸
Width-to-depth ratio in Class I, II, and III watercourses	Improving trend ⁶⁹

⁶⁵ Embeddedness measures the degree to which the larger particles (boulders, rubble, or gravel) of watercourse channels are surrounded or covered by fine sediment, impeding the ability of fish to dig an adequate redd, or nest. Measurements are generally recorded as 0-25 percent, 25-50 percent, 50-75 percent, or 75-100 percent embedded. An improving trend would be represented by a decrease in embeddedness as measured over a rolling 10 year period.

⁶⁶ Primary pools have a depth greater than three feet at the pool's deepest point, a width greater than one-half the width of the low flow channel at the pool's widest point (measured by a transect perpendicular to flow), and a length greater than the width of the low-flow channel at the pool's longest point (measured by a transect parallel to flow). Primary pool frequency will be measured by surveying segments of the watercourse that provide a statistically significant representation of the watercourse as a whole and are located based on field conditions.

⁶⁷ V* is a numerical value that represents the proportion of fine sediment that occupies the scoured residual volume of a pool. Stream order is the designation of the relative position of stream segments in the drainage basin network. For example, a first order stream is the smallest, unbranched, tributary that terminates at the upper point. A second order stream is formed when two first order streams join.

⁶⁸ An improving trend in large woody debris would be represented by an increase in the volume of large woody debris measured within a given stream segment over a rolling 10 year period. Large woody debris is defined as a piece of woody material having a diameter greater than 30 cm (12 inches) and a length greater than 2 m (6 feet) that is located in a position where it is in the watercourse channel or may enter the watercourse channel.

⁶⁹ An improving trend in the width-to-depth ratio would be represented by a change over a rolling 10 year period in the existing width-to-depth ratio towards the width-to-depth ratio appropriate for the stream channel type in question, as determined using the Rosgen stream classification system described in *Applied River Morphology* (1996) by Dave Rosgen.

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PARAMETER	NUMERIC TARGET
Thalweg profile in Class I, II, and III watercourses	Increasing variability around the mean
Inman, Signal and Hathaway (Planning Watersheds 113.70014, 113.70020 and 113.70026 except mainstem)	0 percent open stream channel ⁷⁰
Pardaloe, Larmour, Whitlow, and Blue Waterhole and North Fork (Planning Watersheds 113.70010 – 113.70013 and 113.70025)	<1 percent open stream channel
Rolling Brook (Planning Watershed 113.70024)	<3 percent open stream channel
Graphite, Beebe (Planning Watersheds 113.70021 – 113.70022)	<6 percent open stream channel
South Fork (Planning Watershed 113.70023)	<20 percent open stream channel

Table 6-7: Average Annual Sediment Load⁷¹

SOURCE	ESTIMATED AVERAGE ANNUAL SEDIMENT LOAD (tons/mi ² /yr)
Natural Background	
Mass wasting	162
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
Roads (including skid trails)	
Mass wasting	486
Fluvial erosion	532
Surface erosion	38
Timber Harvest Units	
Mass wasting	162
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
Agricultural Operations	
Mass wasting	Insufficient data
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
TOTAL	1,380

A 60 percent reduction of the average annual sediment load to the Garcia River watershed (1,380 tons/mi²) results in a loading capacity of 552 tons/mi²/yr [a)1,380 X

⁷⁰ Open stream channels are those segments of channel, as viewed in aerial photographs with a 1:24,000 resolution or better, that are not covered by canopy and thus are visible.

⁷¹ Derived from: *Garcia River Sediment Total Maximum Daily Load, Table 16*, promulgated by U.S. EPA, Region IX on March 16, 1998

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0.60=828; b) 1,380-828=552]. The loading capacity of 552 tons/mi²/yr is a conservative estimate based on the best available data, and will be measured over a 40-year period. This loading capacity is the TMDL for the purposes of 40 CFR 130.2 and 130.7. As a phased TMDL, the loading capacity can be modified through a Basin Plan amendment if new information is made available that supports such modification. Neither the order of magnitude of the overall sediment budget nor that of the loading capacity is expected to change significantly as a result of new information.

6.3.3.5 Load Allocations

The existing data are insufficient to allocate specific components of the TMDL to individual landowners or to individual land management activities. That is, it does not include estimates of sediment delivery from individual properties, all land use, or the amount of sediment delivery that can be reasonably controlled. These three elements are necessary to form rational individual load allocations.

To address the limitations in the existing data, a general load allocation is developed as follows. It is phased, as contemplated in a phased TMDL. First, landowners are required to inventory the Sediment Delivery Sites on their property. Sediment Delivery Sites are controllable, human-caused erosion sites that are currently eroding or have the potential to erode in such a manner as to deliver sediment to a watercourse. Landowners are then directed to reduce the controllable volume of sediment at the inventoried Sediment Delivery Sites. Correction or control of these sites is required according to a schedule contained in the Implementation Schedule section. Landowners are also directed to assess their property for Unstable Areas. Unstable Areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent or mitigate sediment discharges. Finally, landowners are directed to implement protective land management measures designed to control future sediment delivery from land management activities on the identified unstable areas and on riparian areas, and from activities related to roads, skid trails, landings, agricultural facilities, and gravel mining. These practices are to be implemented in accordance with the schedules contained in the Implementation Section.

In short, as the first phase, landowners are directed to identify and control all existing and future controllable discharges of sediment. Controllable discharges are those discharges resulting from human activities that can influence the quality of waters of the State and that can be reasonably controlled by prevention or mitigation. For the purposes of the TMDL equation, the load allocation is expressed as zero controllable discharges. For the purpose of implementation and as noted in Table 6-9, it is recognized that measures to control discharges are not 100 percent effective. In the absence of additional data, the North Coast Water Board judges that this program of source identification and source control will result, over time, in a reduction in the rate of sediment delivered to watercourses in the Garcia River Watershed that is comparable to the rate that existed prior to the steep decline in salmonid populations and attainment of the desired future conditions. As per the Loading Capacity Calculation, that level of sediment delivery is estimated to be 552 tons/mi²/yr. Should additional data be made available to the North Coast Water Board that supports a revision to the Load Allocation, the North Coast Water Board will consider such revisions in a Basin Plan amendment.

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6.3.3.6 *Implementation Plan*

The Implementation Plan is intended to control existing and future sources of sediment delivery resulting from human activity to the Garcia River and its tributaries. To control these sources, three options are offered to landowners. These options are:

- Option 1. Comply with the waste discharge prohibitions that apply within the Garcia River Watershed.
- Option 2. Comply with an approved Erosion Control Plan and an approved Site-Specific Management Plan, or
- Option 3. Comply with an approved Erosion Control Plan and the Garcia River Management Plan.

Waste Discharge Prohibitions that Apply within the Garcia River Watershed

The following waste discharge prohibitions apply within the Garcia River Watershed:

- 1. The controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, gravel mining, agricultural, grazing, or other activity of whatever nature into waters of the state within the Garcia River Watershed is prohibited.
- 2. The controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, gravel mining, agricultural, grazing, or other activity of whatever nature to a location where such material could pass into waters of the state within the Garcia River Watershed is prohibited.

Controllable discharges are those discharges resulting from human activities that can influence the quality of the water of the State and that can be reasonably controlled through prevention, mitigation or restoration. The above two waste discharge prohibitions replace the regionwide waste discharge prohibitions contained in the action plan for logging, construction, and associated activities. The regionwide waste discharge prohibitions no longer apply to activities in the Garcia River Watershed. The above two prohibitions do not apply to landowners who are conducting their land management activities in accordance with an approved Erosion Control Plan *and* either an approved Site-Specific Management Plan or the Garcia River Management Plan (Options 2 and 3, respectively). If the North Coast Water Board finds that significant discharges or threatened discharges of sediment occur despite the implementation of an approved Erosion Control Plan and either an approved Site-Specific Management Plan or the Garcia River Management Plan, it will consider the need to revise the plans and will consider the issuance of a Cleanup and Abatement Order to address the discharge, but it will not impose administrative civil liabilities for violations of the prohibitions.

All landowners choosing either Option 2 or 3 as described above must submit an Erosion Control Plan. The general purpose of the Erosion Control Plan is to outline the program by which a landowner or landowners will identify areas of sediment delivery, identify areas at risk of sediment delivery, and control all sediment delivery associated with past and present land management activities. The necessary components of an Erosion Control Plan are enumerated below.

In addition, landowners choosing Option 2 must submit a Site-Specific Management Plan. Those choosing Option 3 must comply with the Garcia River Management Plan, as

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outlined below. (The Site-Specific Management Plan and Garcia River Management Plan are collectively referred to as Management Plans.) The general purpose of the Management Plans is to outline the program by which a landowner or landowners will manage their property or properties to reduce the future risk of initiating new sediment delivery problems and to increase the ability of the Riparian Management Zone to properly function with regard to sediment filtering, large woody debris recruitment and stream bank stabilization.

A Site-Specific Management Plan differs from the Garcia River Management Plan. With the Site-Specific Management Plan, the landowner is able to select land management measures for controlling sediment that are suitable for the specific activities and conditions on his or her land. In the Garcia River Management Plan, more general land management measures are specified for unstable areas and riparian areas, and for activities related to roads, skid trails, landings, near stream facilities, and gravel mining. The North Coast Water Board strongly encourages all landowners to prepare Site-Specific Management Plans and to use the Garcia River Management Plan only until they can develop their own plans to control discharges of sediment from their properties. The North Coast Water Board also encourages groups of dischargers with similar land management activities to develop collective watershed-based Erosion Control Plans and Site-Specific Management Plans (Group Plans), where appropriate.

Erosion Control Plans, Site-Specific Management Plans, and the Garcia River Management Plan are not independently enforceable. The submission of an Erosion Control Plan and Site-Specific Management Plan by a landowner does not create an obligation by the landowner to implement the plans. However, if the landowner chooses not to implement the plans, then Option 1 will apply. In addition, none of the land management measures contained in a Management Plan shall be construed as a gift or dedication of private lands to the general public. A landowner may submit to the Executive Officer a request for an interim extension of time to develop or implement either the Erosion Control Plan or the Management Plan. If the Executive Officer determines that the landowner is making a good faith effort to develop or implement the plans in accordance with the final timelines described in the Implementation Schedule, the extension will be granted. A landowner who is not making a good faith effort to develop or implement an Erosion Control Plan and a Management Plan is subject to the above prohibitions (Option 1).

The elements of an approvable Erosion Control Plan and Site-Specific Management Plan are described below. In addition, the Garcia River Management Plan is outlined in detail. Erosion Control Plans must be submitted no later than January 3, 2005. Site-Specific Management Plans can be submitted at any time. The Garcia River Management Plan must be implemented by January 3, 2002 or substituted by an approved Site-Specific Management Plan.

Elements of an Erosion Control Plan

1. Baseline Data Inventory

A Baseline Data Inventory includes an ownership-wide inventory of Sediment Delivery Sites. Sediment Delivery Sites are controllable, human-caused erosion sites that are currently eroding or have the potential to erode in such a manner as

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to deliver at least 10 cubic yards of sediment to a watercourse over the life of the TMDL. They include such features as undersized culverts, culverts with diversion potential, eroding sidecast or fill, downcutting inside ditches, etc.

The Baseline Data Inventory shall include a description of all active and potential sediment sources resulting from roads, landings, skid trails, timber operations and agricultural operations, and other significant human-caused earth movement activities that have or might have the ability to enter waters of the state.

The Baseline Data Inventory shall include, at a minimum:

- A description of the inventory method used;
- A topographic map with 80 foot intervals showing the ownership boundary and the location of all inventoried sites, as well as roads and drainages; and
- For each site, an estimate of the volume of sediment and the relative potential for sediment delivery.

The Baseline Data Inventory must be comprehensive and may follow as examples, completely or in part, the inventory methods described in the *Assessment and Implementation Techniques for Road-Related Sediment Inventories and Storm-Proofing* and contained in the draft *Sustained Yield Plan/Habitat Conservation Plan* for the Pacific Lumber Company (August 25, 1997, Appendix 20, prepared by William Weaver, of Pacific Watershed Associates, Inc.); the *STAR* Worksheet system of the *Watershed and Aquatic Habitat Assessment* (September 29, 1997, Appendix 6:1 prepared by Coastal Forestlands, Ltd.); or the *Sediment TMDL Inventory and Monitoring Worksheet* developed by U.C. Davis (1998).

2. Sediment Reduction Schedule

The Sediment Reduction Schedule shall describe how and in what order of priority the sediment discharges from the Sediment Delivery Sites identified in the Baseline Data Inventory will be reduced in accordance with the schedule set forth in *Table 6-9* of the Implementation Schedule section. The Baseline Data Inventory described in 1. above shall be used when prioritizing and conducting sediment delivery reduction activities, and the highest priority for sediment delivery reduction shall be assigned to those sites with the greatest potential to discharge sediment to a watercourse that supports fish.

3. Assessment of Unstable Areas

The Assessment of Unstable Areas shall identify through modeling, data analysis and/or a field inventory, areas of instability across the property. Unstable Areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent, restore or mitigate sediment discharges. Unstable Areas are characterized by slide areas, gullies, eroding stream banks, or unstable soils that are capable of delivering sediment to a watercourse. Slide areas include shallow and deep seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges and hummocky ground. Unstable soils

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include unconsolidated, non-cohesive soils and colluvial debris.

The Assessment of Unstable Areas shall include, at a minimum:

- All known active and potential shallow and deep-seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges, and unstable soils.
- All known active or potentially active gullies and streambank erosion sites, as appropriate, but should not include the sites identified in 1. above.

Preparers of the Assessment of Unstable Areas may but are not required to use existing California Department of Conservation maps such as the series entitled "Geology and Geomorphic Features Related to Landsliding" or a digital terrain-type model like the one developed by Louisiana Pacific Corporation in its draft *Sustained Yield Plan for Coastal Mendocino County* (1997) in combination with field-based maps of Unstable Areas.

4. Monitoring Plan

The Monitoring Plan shall describe the method for monitoring the effectiveness of the sediment control efforts the landowner or group of landowners has implemented for the Sediment Delivery Sites identified in the Baseline Data Inventory. The monitoring method must be consistent with the submitted Baseline Data Inventory method so that results are comparable from year to year. The results of the sediment control efforts and any other erosion control related activities, including the implementation of land management measures, shall be submitted to the North Coast Water Board in an annual report, due January 30. Any changes in ownership or primary land management activities shall also be included in the annual report. In addition, individual landowners are encouraged to establish instream monitoring points above and below any significant land management activity on their properties and in potential anadromous fish refugia. (See Monitoring section, below).

Elements of a Site-Specific Management Plan

1. Description of Land Management Measures to Control Sediment Delivery

A Site-Specific Management Plan shall include a description of, and schedule for, the Land Management Measures the landowner proposes to implement to control the future delivery of sediment from the following land management activities:

- Roads, landings, skid trails, watercourse crossing construction, reconstruction, maintenance, use, and obliteration;
- Operations on unstable slopes;
- Use of skid trails and landings;
- Use of near stream facilities, including agricultural activities; and
- Gravel mining.
-

In addition, the description must include:

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- A Long-term Road System Plan (Road Plan) similar to that described below in the Garcia River Management Plan, and
- Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan.

2. Description of Land Management Measures to Improve the Condition of the Riparian Management Zone

The Site-Specific Management Plan shall include a description of, and schedule for, the Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,
- Filtering of eroded material prior to its entering the watercourse channel, and
- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

Group Plans

Dischargers with similar land management activities may choose to develop collective Erosion Control Plans and Management Plans (Group Plans). Group Plans offer landowners the ability to work together to solve their erosion problems, while also affording a measure of privacy to the members of the Group. The Group Plan shall clearly indicate the members of the Group and the land that is covered under the Group Plan. Where a Group member has multiple land management activities (e.g., ranching and timber harvesting), the Group Plan will cover only that portion of the member's land that is used for land management activities that are similar to those of the remainder of the Group.

The Implementation Plan applies to Groups in the same manner as it applies to individual landowners except as noted below. A Group Erosion Control Plan shall contain the same elements and level of detail as an individual Erosion Control Plan, with the following exceptions. (1) The Baseline Data Inventory Map shall show the perimeter boundary of the land covered by the Group Plan, but it does not need to depict the members' interior ownership boundaries. Shading or cross-hatching shall be used to depict any properties within the perimeter that are not covered by the Group Plan. (2) The Baseline Data Inventory Map shall show the location of the Group's Sediment Delivery Sites, but the specific Sediment Delivery Sites do not need to be associated with any individual landowner. (3) The Sediment Reduction Schedule shall be consistent with the schedule in Table 6-9 but the sediment control work may be prioritized on a Group basis, rather

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than an individual landowner basis. (4) The Assessment of Unstable Areas does not need to be associated with any individual landowner. The Group Management Plan shall include the elements of either a Site Specific Management Plan or the Garcia River Management Plan (or a combination of the two), but the management measures shall be associated with the Group, rather than any of the individual landowners.

All members of the Group are responsible for ensuring that the Group Plans are developed and implemented. The waste discharge prohibitions do not apply to any of the members of the Group as long as the approved Group Plans are being implemented. If the Group Plan is not developed or implemented due to a member's failure to make a good faith effort to develop or implement the Group Plan, then that individual member of the Group is subject to the Prohibitions. Membership in a Group shall be based upon consent of all the members of the Group. The Group may change its membership by submitting a revised Group Plan for approval by the Executive Officer.

Relation of Other Planning Efforts to Erosion Control Plans and Management Plans

The North Coast Water Board does not intend for landowners to engage in duplicative or overly complex planning efforts if they are already involved in planning efforts that will satisfy the requirements of this Basin Plan Amendment. For example, the North Coast Water Board will consider all of the following to be approvable as an Erosion Control Plan and Management Plan, as long as three conditions are met. First, the document(s) must include, or be modified to include, the elements described above. Second, the document(s) must demonstrate water quality protection and restoration for the area of ownership that is roughly equivalent to the Garcia River Management Plan. Third, the document(s) must provide an assurance that the Implementation Schedule will be met.

- Non-Industrial Timber Management Plans
- Sustained Yield Plans
- Habitat Conservation Plans
- Letters of Intent followed by Ranch Plans as described in the California Rangeland Water Quality Management Plan (July 1995)
- Timber Harvest Plans that cover entire ownerships

The Garcia River Management Plan

The term "roads" as used in the Garcia River Management Plan include private roads, public roads, rural residential roads, skid trails, and landings. The term "near stream facility" includes any building, equipment, corral, pen, pasture, field, trail, livestock crossing or other feature or structure which is associated with commercial land use operations and is close enough to any watercourse to have the potential to cause the discharge of sediment to the watercourse. The term "feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technical factors.

Land Management Measures That Apply To Roads, Watercourse Crossings, and Near Stream Facilities Throughout the Garcia River Watershed

By January 3, 2005, a Long-term Road System Plan (Road Plan) shall be developed and submitted which describes the long-term road system, and identifies all roads and

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watercourse crossings. The road system described in the Road Plan shall be designed and constructed to provide surfacing, drainage, and watercourse crossings to match the intended road use and maintenance abilities. Roads (including road prism and watercourse crossing drainage structures) that are constructed or reconstructed after January 3, 2002, shall comply with the standards below. Existing usable roads will be scheduled for upgrading as necessary as Sediment Delivery Sites under the Erosion Control Plan. Roads that are not needed as part of the long-term road system and that discharge or threaten to discharge earthen material to waters of the state shall be scheduled as necessary for abandonment or obliteration as Sediment Delivery Sites under the Erosion Control Plan. The road plan shall include, at a minimum:

- The location of all roads and watercourse crossings within the ownership,
 - The current status of each road, including road surface material, road and watercourse design, and use restrictions, and
 - The future plan and schedule for each road.
- A. Roads used year-round shall be designed, constructed, reconstructed or upgraded to permanent road status with the application of an adequate layer of competent rock for surface material and the installation of permanent watercourse crossings and road prism drainage structures. These roads shall receive regular and storm period inspection and maintenance.
- B. Roads used primarily during the dry season but to a limited extent during wet weather shall be designed, constructed, reconstructed or upgraded to seasonal road status with the application of spot rocking where needed to provide a stable running surface during the period of use. These roads shall be designed, constructed, reconstructed, and upgraded to provide permanent watercourse crossings and road surface drainage structures. These roads shall receive inspection at least once during the wet weather period and shall receive at least annual maintenance.
- C. Roads that are not used or maintained during wet weather shall be constructed or reconstructed to a temporary road status. Spot rocking of the road surface shall be used, where needed, to provide a stable running surface during the period of use. Road surface drainage structures shall be designed and constructed to prevent erosion so that regular and storm period maintenance is not needed to prevent sediment discharge to watercourses. All roads that will not receive at least annual maintenance shall have watercourse crossings, except rock fords, removed prior to October 15 of each year of installation.

All watercourse road crossings shall, at a minimum, utilize the standards described on pages 64 - 79 of the Handbook for Forest and Ranch Roads (prepared by Weaver and Hagans, 1994). These standards include but are not limited to the design and installation of permanent crossings using a culvert with a minimum diameter designed to pass at least a 50-year flood frequency event. Larger diameter culverts shall be used if debris that might result in blockage of the culvert inlet is present in the channel. All crossings shall be designed and installed to prevent the diversion of stream flow down or through the road prism in the event of culvert failure, and to provide free passage to fish at all flow regimes. All watercourse road crossings that do not meet these minimum standards as of January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites under the Erosion Control Plan. All watercourse road crossings installed after January 3, 2002, must be installed according to these minimum standards.

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All road design, construction, and reconstruction shall use, at a minimum, the standards described on pages 39 - 54 and 81 - 120 of the Handbook for Forest Ranch Roads (prepared by Weaver and Hagans, 1994). These standards include but are not limited to the outsloping of the road prism (whenever feasible and safe) and the installation of rolling dips (rather than water bars) for additional road drainage. If insloped roads are necessary, ditch relief culverts shall be installed, at a minimum, at the distances described in Table 20 of the Handbook for Forest and Ranch Roads, and located to prevent discharge of road drainage directly onto erodible soils. All roads that do not meet the minimum standards as of January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites under the Erosion Control Plan. All roads constructed or reconstructed after January 3, 2002, must be constructed or reconstructed to these minimum standards.

Straw bale check dams or silt fences shall be installed at the outlet of all road drainage structures prior to use of the road for all roads used after January 3, 2002, if less than one hundred feet of 90 percent vegetative buffer exists between the outlet and a watercourse. Road drainage structures with less than one hundred feet of 90 percent vegetative buffer that are associated with roads not in use after January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites.

After January 3, 2002, there shall be no construction, reconstruction, or use of roads within the channel of any watercourse. This measure does not apply to watercourse crossings.

After January 3, 2002, there shall be no construction, reconstruction, or use of skid trails on slopes greater than 40 percent within 200 feet of a watercourse, as measured from the channel or bankfull stage, whichever is wider.

After January 3, 2002, there shall be no use of roads or near stream facilities, when the activity contributes to the discharge of visibly turbid water from the road or near stream facility surface or is flowing in an inside ditch in amounts that cause a visible increase in the turbidity of a watercourse. As an exception, short-term, temporary use of near stream facilities may occur if there is no feasible alternative.

After January 3, 2002, the use of heavy equipment (defined as 1.5 tons) between October 15 and May 1 shall be limited to roads that have permanent drainage and are surfaced with an adequate layer of rock to maintain a stable road surface throughout the period of use. A stable road surface is defined as a surface that does not allow the concentration of road runoff to the extent that depressions or rills that are capable of channeling water are formed on the road surface. On near stream facilities, use of heavy equipment in this time period shall be limited to facilities with drainage collection and storage capabilities and/or facilities with a stable soil surface throughout the period of use. As an exception, short-term, temporary use of heavy equipment on near stream facilities may occur if there is no feasible alternative.

After January 3, 2002, all roads and other near stream facilities that are actively used shall have drainage and/or drainage collection and storage facilities installed before the start of any rain that causes overland flow across or along the disturbed surface and could result in the delivery of sediment to a watercourse. Roads and near stream facilities that are no longer actively used and have the potential to discharge sediment to a water of the state shall be addressed as necessary as Sediment Delivery Sites.

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After January 3, 2002, there shall be no road construction, reconstruction, or upgrading from October 15 to May 1, except for emergency road maintenance.

After January 3, 2002, all new crossings installed as temporary watercourse crossings and designed to carry less water and debris than predicted for a 50-year flood discharge shall be removed and stabilized by October 15 of each year of installation. For all watercourses, the approaches to all temporary watercourse crossings shall be pulled back to create side slopes of less than 50 percent, and stabilized with rock, grass seed, mulch, or slash from the lowest (closest) drainage structure to the watercourse transition line. Existing temporary watercourse crossings not removed and stabilized by January 3, 2002, shall be addressed as necessary as Sediment Delivery Sites.

After January 3, 2002, off-channel water drafting and livestock watering locations shall be developed to the extent feasible.

Land Management Measures That Apply in Unstable Areas – effective date January 3, 2002

1. No road construction shall occur across unstable areas without the field review and development of site-specific mitigation measures by a Certified Engineering Geologist registered in the State of California. A report prepared by the Certified Engineering Geologist shall be submitted to the North Coast Water Board before construction/ reconstruction activities begin.
2. No more than 50 percent of the existing basal area formed by tree species shall be removed from unstable areas that have the potential to deliver sediment into a watercourse.
3. No concentrated flow shall be directed across the head, toe, or lateral margin of any unstable area.
4. Agricultural activities on unstable slopes that have the potential to deliver sediment to a water of the state shall be minimized to the extent practical.

Land Management Measures That Apply in the Riparian Management Zone

A Riparian Management Zone width shall be assigned to each watercourse based on the class of the watercourse. For Class I and II watercourses, the Riparian Management Zone is a 100-foot strip of land on each side of, and adjacent to, the watercourse. For Class III watercourses, the Riparian Management Zone is a 50-foot strip of land on each side of, and adjacent to, the watercourse. The Riparian Management Zone shall be measured from the active channel or bankfull stage, whichever is wider.

1. All roads within the Riparian Management Zone used after January 3, 2002, shall be surfaced with competent rock to a sufficient depth prior to use of the road to prevent road fines from discharging into watercourses.
2. After January 3, 2002, any new soil exposure within the Riparian Management Zone caused by land management activities shall be stabilized with the application of grass seed, mulch, slash or rock before October 15 of the year of disturbance. Stabilization measures shall achieve at least 90 percent coverage of all soil within the Riparian Management Zone exposed by land management activities. Existing exposed soil caused by land management activities that is not stabilized prior to January 3, 2002, shall be addressed as Sediment Delivery Sites.

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3. After January 3, 2002, to promote stream bank stability, each landowner shall ensure that there are no commercial land management activities, including commercial or salvage timber harvest, grazing or crop agriculture, within the first 25 feet of the Riparian Management Zone for Class I or II watercourses. This measure does not apply to watercourse crossings. Commercial land management activities existing prior to January 3, 2002, must be phased out by January 3, 2007.
4. After January 3, 2002, in order to maintain present levels and promote future instream large woody debris, each landowner shall restrict commercial land use activities within the Riparian Management Zone to ensure that:
5. There is no removal of downed large woody debris from watercourse channels unless the debris is causing a safety hazard.
6. On Class I and II watercourses, at least five standing conifer trees greater than 32 inches in diameter at breast height (DBH) are permanently retained at any given time per 100 linear feet of watercourse. Where sites lack enough trees to meet this goal, there shall be no commercial harvest of the five largest diameter trees per 100 linear feet of watercourse.
7. There is no removal of trees from unstable areas within a Riparian Management Zone that have the potential to deliver sediment to a water of the state unless the tree is causing a safety hazard.

Land Management Measures That Apply to Gravel Mining in the Garcia River Watershed – effective date January 3, 2002

1. In-channel gravel mining shall follow the following recommendations from the *Garcia River Gravel Management Plan*, prepared for the Mendocino County Water Agency, August 1996.
 - A. Establish an Absolute Elevation below Which No Extraction May Occur. The absolute elevation below which no mining could occur would be surveyed on a site specific basis. A “redline” elevation tied to National Geodetic Vertical Datum of 1929 (NGVD) or North American Vertical Datum (NAVD) should be established below which mining may not take place, in order to avoid impacts to structures such as bridges and to avoid vegetation impacts associated with downcutting due to excess removal of sediment. A redline elevation should be 2 feet above the low flow water surface elevation (at the edge of the bar closest to the low flow channel) during the first year following adoption of the gravel management plan (assuming that this will occur in 1996) [note: The Mendocino County adopted the Gravel Management Plan on December 9, 1996]. A 2-foot minimum elevation as a buffer with a 2% grade toward the bank is consistent with that required by the NOAA Fisheries.
 - B. Limit In-channel Extraction Methods To “Bar Skimming” or an Alternative Method Recommended by the Mendocino County Data Evaluation Team. If mining is limited to the downstream end of the bar as described above with a riparian buffer on both the channel and hillslope (or floodplain) side, bar skimming would minimize impacts. Other methods such as excavation of trenches or pools in the low flow channel lower the local base level, and maximize upstream (headcutting

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and incision) and downstream (widening and braiding) impacts. In addition, direct disturbance of the substrate in the low flow channel should be avoided. Trenching on bars (described in the Eel River EIR; EIP, 1992) may be beneficial in the future for the Garcia River if it becomes severely aggraded, flat, shallow, and braided and has few invertebrates. The Department of Fish and Wildlife should be consulted in order to determine if the Garcia River meets these conditions in the future. In the future, the Mendocino County Data Evaluation Team should have flexibility to decide on the most appropriate method to enhance habitat on a site specific basis.

An excavated pool (or larger in-stream pit) acts as a local base level, and can cause upstream and downstream incision as the channel re-establishes its gradient. Incision is a negative effect of trenching that may result in increased bank erosion and loss of habitat. In-channel excavation of pools would take place in summer after June 15 – after the need for spawning habitat has passed. Subsequent winter flows may refill the pool before it can be used by fish in the following season.

- C. Grade Slope of Excavated Bar to Prevent Fish Entrapment. Excavation on bars by gravel skimming would have a 2% slope toward the bank. After extraction, gravel bars must be left void of isolated pockets or holes.
- D. Extract Gravel from the Downstream Portion of the Bar. Retaining the upstream one to two thirds of the bar and riparian vegetation while excavating from the downstream third of the bar is accepted as a method to promote channel stability and protect the narrow width of the low flow channel necessary for fish. Gravel would be redeposited in the excavated downstream one to two thirds of the bar (or downstream of the widest point of the bar) where an eddy would form during sediment transporting flows. In contrast, if excavation occurs on the entire bar after removing existing riparian vegetation, there is a greater potential for widening and braiding of the low flow channel.
- E. Concentrate Activities to Minimize Disturbance. In-channel extraction activities should be concentrated or localized to a few bars rather than spread out over many bars. This localization of extraction will minimize the area of disturbance of upstream and downstream effects. Skimming decreases habitat and species diversity - these effects should not be expanded over a large portion of the study area.
- F. Maintain Flood Capacity. Flood capacity in the Garcia River should be maintained in areas where there are significant flood hazards to existing structures or infrastructure.
- G. Minimize Activities That Release Fine Sediment to the River. No washing, crushing, screening, stockpiling, or plant operations should occur at or below the streams “average high water elevation,” or the dominant discharge. In the Garcia River the elevation of the dominant discharge is near the top of bank. These and

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similar activities have the potential to release fine sediments into the stream, providing habitat conditions deleterious to salmonids. The Regional Water Board regulates fine sediment releases to the river from gravel processing through its waste discharge requirements. Gravel mining and processing applicants should notify the Regional Water Board if waste discharge requirements are applicable to their operation.

- H. Avoid Dry Road Crossings. Dry road crossings disrupt the substrate and can result in direct mortality or increased predation opportunity on fry. The crossing of choice and the one utilized in recent years in the lower Garcia is the free-span seasonal bridge. This type of crossing protects the upstream habitat as well as improving river conditions for recreation. If dry crossings are unavoidable, they should not be placed in the channel prior to June 15, and should be removed by October 15 so that they do not interfere with incubating or migrating salmonids. The number of crossings should be kept to a minimum. Placement of crossings should also take into account the damage which might occur to riparian vegetation. Roads should lead directly to the crossings and not long distances through the riparian corridor. Placement of any road crossing should be done with the approval of the Data Evaluation Team. Any structure placed across a river or recreationally navigable stream should be designed and installed so as to provide sufficient overhead clearance to allow unobstructed and safe passage for small recreational craft.
 - I. Limit In-channel Operations to the Period Between June 15 and October 15. Gravel extraction for outside this window may interfere with salmonid incubation and migration. The hatching period for late steelhead spawners may extend for 40-50 days. Therefore, the June 15 start date is necessary to protect eggs laid from late April to May. Spawning salmonids have been observed in the Garcia River system as late as June 2.
 - J. Avoid Expansion of Instream Mining Activities Upstream of River Mile 3.7. The reach of channel upstream of River Mile 3.7 is important to steelhead spawning. Gravel mining increases the probability of additional fine sediments in spawning gravels. In order to maintain suitable spawning gravels of riffles in this reach, it is strongly recommended that gravel mining within this reach be restricted to the site of present operations.
2. Floodplain (Off-Channel) gravel mining shall follow the following recommendations from the Garcia River Gravel Management Plan, prepared for the Mendocino County Water Agency, August 1996.
- A. Floodplain Gravel Extraction Should Be Set Back from the Main Channel. In a dynamic alluvial system, it is not uncommon for meanders to migrate across a floodplain. In areas where gravel extraction occurs on floodplains or terraces, there is a potential for the river channel to migrate toward the pit. If the river

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erodes through the area left between the excavated pit and the river, there is a potential for “river capture,” a situation where the low flow channel is diverted through the pit. In the Garcia River, a setback of at least 400 feet is recommended to minimize the potential for river capture. In order to avoid river capture, excavation pits should set back from the river to provide a buffer and should be designed to withstand the 100-year flood. Adequate buffer widths and reduced pit slope gradients are preferred over engineered structures which require maintenance in perpetuity. Hydraulic, geomorphic and geotechnical studies should be conducted prior to design and construction of the pit and levee.

In addition to river capture, extraction pits create the possibility of stranding fish. To avoid this impact, California Department of Fish and Game (CDFG) requires that all off-channel mining be conducted above the 25-year floodplain.

- B. The Maximum Depth of Floodplain Gravel Extraction Should Remain above the Channel Thalweg. Floodplain gravel pits should not be excavated below the elevation of the thalweg in the adjacent channel. This will minimize the impacts of potential river capture by limiting the potential for headcutting and the potential of the pit to trap sediment. A shallow excavation (above the water table) would provide a depression that would fill with water part of the year, and develop seasonal wetland habitat. An excavation below the water table would provide deep water habitat.
- C. Side Slopes of Floodplain Excavation Should Range from 3:1 to 10:1. Side slopes of a floodplain pit should be graded to a slope that ranges from 3:1 to 10:1. This will allow for a range of vegetation from wetland to upland. Steep side slopes excavated in floodplain pits on other systems have not been successfully reclaimed, since it is difficult for vegetation to become established. Terrace pits should be designed with a large percentage of edge habitat with a low gradient which will naturally sustain vegetation at a variety of water levels. Pit margins should be reclaimed with riparian buffer zones of fifty feet surrounding them. Islands should be incorporated into the reclaimed pits as waterfowl refugia. Pits should be designed with input from the Mosquito Abatement District.
- D. Place Stockpiled Topsoil above the 25-year Floodplain. Stockpiled topsoil can introduce a large supply of fines to the river during a flood event and degrade salmonid habitat. The CDFW considers storage above the 25-year flood inundation level sufficient to minimize this risk.
- E. Floodplain Pits Should Be Restored to Wetland Habitat or Reclaimed for Agriculture. There are very few examples of successfully restored or reclaimed gravel extraction pits on other river systems with gravel extraction. The key to overcoming barriers to successful restoration or reclamation is to conserve or import adequate material to refill the pit, while ensuring that pit margins are graded to allow for development of significant wetland and emergent vegetation.

Review of Individual Land Management Projects

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Proposed land management projects that require North Coast Water Board review for possible issuance of waste discharge requirements pursuant to Section 13260 of the California Porter-Cologne Water Quality Control Act, Clean Water Act Section 404 permits, and/or Clean Water Act Section 401 certification shall comply with this Action Plan, including TMDL, Implementation Plan and Monitoring Plan, as appropriate.

Restoration Projects

Landowners, agencies, and interested groups are encouraged to continue their interest, participation, and cooperation with restoration activities in the Garcia River Watershed. Restoration is a tool useful for both stabilizing eroding stream banks throughout the watershed and improving instream habitat conditions. To ensure that stream restoration projects are planned and implemented in a manner that allows compliance with the provisions of the Action Plan, each landowner conducting restoration projects on his/her ownership shall notify the North Coast Water Board in writing of any stream restoration activity, its location, the time frame of the project, and a summary of the work proposed. Landowners may propose to conduct restoration work in lieu of controlling a Sediment Delivery Site. The Executive Officer may consider allowing such a substitute in those cases where a greater environmental benefit would result.

Implementation Schedule

This Action Plan, including TMDL, Implementation Plan, and Monitoring Plan will take effect on January 3, 2002, in order to give landowners in the watershed the opportunity to implement voluntary actions.

Regional Water Board staff will send a letter to each landowner in the Garcia River Watershed requesting a Statement of Intent regarding this Action Plan. The North Coast Water Board letter will describe the options available to the landowner, which are as follows:

- Option 1. Comply with the waste discharge prohibitions that apply to the Garcia River Watershed.
- Option 2. Comply with an approved Erosion Control Plan and a Site-Specific Management Plan.
- Option 3. Comply with an approved Erosion Control Plan and the Garcia River Management Plan.

Landowners must comply with this Action Plan, including TMDL, Implementation Plan and Monitoring Plan through one of these three options or face potential permitting and/or enforcement action in the event of discharges of sediment. Landowners who do not submit a Statement of Intent are subject to the waste discharge prohibitions (Option 1).

North Coast Water Board staff will review and respond to each Statement of Intent. The Board will then prioritize efforts in the Garcia River Watershed, based on its general estimates of relative threat to water quality. Highest priority will be assigned on an ownership by ownership basis to those sites identified as having the highest existing discharge or potential discharge of sediment to a watercourse that supports fisheries.

Landowners who intend to follow either Option 2 or Option 3 are encouraged to do so as soon as possible and to submit their plans to the North Coast Water Board. North Coast

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Water Board staff will acknowledge receipt of each plan submitted and will review each plan for completeness. The Executive Officer will approve the plans if the review indicates that the plans meet the requirements specified above and complies with the schedule contained in Table 6-9 below. The Executive Officer will notify the landowner of his/her approval in a letter. Prior to approving an Erosion Control Plan or Site-Specific Management Plan, the Executive Officer will provide notice and an opportunity to comment to those who have requested it. At the Executive Officer's discretion, a North Coast Water Board workshop may be scheduled to receive comments. Time extensions and minor revisions to approved Erosion Control Plans and Site-Specific Management Plans may be approved by the Executive Officer without notice.

Table 6-8: Schedule for Reducing Sediment Delivery from Land Management Activities in the Garcia River Watershed

SOURCE AND LAND USE	FINAL COMPLIANCE DATE	ACTIVITY AND INTERIM SCHEDULE⁷²
Roads, landings, skid trails, timber harvest operations, agricultural operations, gravel mining, and other significant human-caused earth movement	January 3, 2005, and every 10 years thereafter, as necessary if new Sediment Delivery Sites are identified	Prepare an ownership-wide Baseline Data Inventory of controllable Sediment Delivery Sites and a Sediment Reduction Schedule for the reduction of sediment from the inventoried sites. No interim schedule.
Unstable Areas	January 3, 2005, and every 10 years thereafter, as necessary if new Unstable Areas are identified	Prepare an ownership-wide Assessment of Unstable Areas. No interim schedule.
Sediment Delivery Sites associated with Roads	January 3, 2015	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites identified in the Baseline Data Inventory in such a manner as to reduce the sediment from sites representing 10 percent of the overall volume of inventoried sediment every year, or until 100 percent of the sites are controlled, whichever occurs first. Control measures are predicted to be 90 percent effective at reducing sediment delivery.

⁷² Compliance with the interim schedules for the control of Sediment Delivery Sites will be calculated by dividing the volume of sediment controlled during each one year or four year period by the overall volume of inventoried sediment associated with that category of source or land use.

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SOURCE AND LAND USE	FINAL COMPLIANCE DATE	ACTIVITY AND INTERIM SCHEDULE⁷²
Sediment Delivery Sites associated with Timber Harvest Operations, including skid trails and landings	January 3, 2015	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites identified in the Baseline Data Inventory in such a manner as to reduce the sediment from sites representing 10 percent of the overall volume of inventoried sediment every year, or until 100 percent of the sites are controlled, whichever occurs first. Control measures are predicted to be 90 percent effective at reducing sediment delivery.
Sediment Delivery Sites associated with agricultural operations in the Riparian Management Zone	January 3, 2025	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites in the Riparian Management Zone in such a manner as to reduce the sediment from sites representing 20 percent of the overall volume of inventoried sediment every four years, or until 100 percent of the sites have been controlled, whichever occurs first. Control measures in the Riparian Management Zone are predicted to be 90 percent effective at reducing sediment delivery.
Sediment Delivery Sites associated with agricultural operations on the hillslopes	January 3, 2025	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites on hillslopes in such a manner as to reduce the overall volume of inventoried sediment by 20 percent every four years, or until a 100 percent of the sites have been controlled, whichever occurs first. Control measures on the hillslopes are predicted to be 50 percent effective at reducing sediment delivery.
Activities on Unstable Areas and in Riparian Management Zones, and activities related to roads, watercourse crossings, near stream facilities, and gravel mining	See the Garcia River Management Plan or the approved Site-Specific Management Plan	Implement Land Management Measures contained in an approved Site-Specific Management Plan or the Garcia River Management Plan in accordance with the schedule contained therein.
Annual Report	January 30, 2004 and each January 30th thereafter	Report to the North Coast Water Board all erosion control-related activities and sedimentation reduction results of the previous year.

6.3.3.7 Monitoring Plan

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Monitoring is intended to provide information regarding the effectiveness of sediment control efforts in attaining the Numeric Targets over time. Instream and hillslope monitoring parameters, monitoring protocols, and frequency of monitoring are described in Table 6-10. Instream and hillslope monitoring by landowners (except for the Sediment Delivery Site monitoring described in the Erosion Control Plan, above) is on a voluntary basis. North Coast Water Board staff will coordinate instream monitoring efforts of the landowners, other regulatory agencies, academic institutions, and members of the public and shall set a goal of establishing at least one instream monitoring point in each of the twelve Planning watersheds in the Garcia River Watershed. In addition, North Coast Water Board staff will work together with the University of California Cooperative Extension to assist landowners in developing voluntary monitoring plans.

Landowners choosing Option 2 or Option 3 should assess the landscape associated with their property to determine which of the listed instream and hillslope monitoring parameters are most appropriately measured and are encouraged to submit their plans for voluntary monitoring to the North Coast Water Board for comment prior to implementing them. Landowners are strongly encouraged to conduct voluntary instream and hillslope monitoring as a means of improving the scientific understanding of the Garcia River watershed and to provide a site specific basis for revising the Action Plan over time. Landowners are particularly encouraged to establish instream monitoring points above and below any significant land management activity on their properties and in potential anadromous fish refugia.

Landowners are required to submit by January 30 of each year an annual report describing the erosion control-related activities of the previous year and the sediment delivery reduction results of those activities, including source reduction volumes. In addition, landowners are encouraged to disclose in the annual reports the results of any voluntary instream and hillslope monitoring. At least annually, North Coast Water Board staff will compile and evaluate the results of the annual reports provided by landowners for review by the North Coast Water Board to assess the progress of the Action Plan. In the event that sufficient information to assess the progress of the Action Plan is not gained through the voluntary monitoring efforts of landowners and others as augmented by the North Coast Water Board, revisions to the monitoring provisions of the Action Plan, through a Basin Plan amendment, will be contemplated.

Table 6-9: Summary of Monitoring Parameters and Protocols

PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
INSTREAM MONITORING			

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
Sediment-related barriers	Any defensible method	Stream survey; identification of sediment deltas, underground stream sections, shotgun culverts, reaches with water depths less than 0.18 meters, etc.; measurement or estimate of extent of barrier and mapping of location.	Annual
Embeddedness	Flosi and Reynolds (1994), Burns (1984)	Identify at least 5 riffle habitat units in Class I streams. Randomly select at least 50 cobbles from each habitat unit and measure or estimate the percent of each cobble which is covered or surrounded by fines. This will be obvious from a dark ring around the cobble indicating its exposure to stream flow. Rate each cobble 1, 2, 3, or 4 as follows: score of 1=cobbles 0-25% surrounded or covered by fines; 2=26- 50%; 3=51-75%; 4=76- 100%.	Annual

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
% fines, gravel composition	McNeil protocol, Valentine (1995)	Identify at least 5 riffle habitat units in Class I streams. Collect at least 2 bulk core samples of sediment in each habitat unit in the first at the pool/riffle break immediately downstream of pool crests. Measure the amount of volume of sediment associated with each size class in the field. Bag at least 5 samples to be weighed in the laboratory to establish a correlation between weight and volume.	Annual
Pool characteristics	Flosi and Reynolds (1994)	Identify at least 10 pool habitat units within a reach that is 20-30 bankfull widths long in Class I streams. Measure habitat unit length, characterize habitat types in each unit, and measure mean width of low flow channel. Measure maximum length, width and depth of all pools in each unit. Measure depth of each pool tail crest.	Annual
Frequency of primary pools	Flosi and Reynolds (1994)	Within each reach (as described above), identify the maximum length of all pools which are >3 feet deep, > in width then 1/2 width of low flow channel, and > in length then width of low flow channel.	Annual

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
V*	Lisle and Hilton (1992), Knopp (1993)	Identify at least 10 survey units within a reach of 20-30 bankfull widths in length in 3rd order streams with slopes 1-4%. Measure the residual volume of each pool within the unit with a graduated rod along transects, as described by Lisle and Hilton.	Annual
D50	Knopp (1993), Rosgen (1996)	Identify at least 5 survey units within a reach of at least 20-30 bankfull channel widths long in 3rd order streams with slopes 1-4%. Lay out transects, as described by Rosgen, and collect at least 100 particles in each reach. Measure the particle, as described, and tally for later graphing.	Annual
Volume of large woody debris	Shuett-Hames (1994) for Timber, Fish and Wildlife Watershed Assessment Manual (Level 2 analysis)	Identify at least 10 survey units of at least 500 feet long within Class I, II and III streams. Identify and measure all pieces of large woody debris (LWD), including logs at least 4 inches in diameter and 72 inches long, and root wads. Note the location of the LWD in the channel, the channel length, wood type, stabilizing factors, pool formation function and orientation and decay class.	At least once every three years

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
Cross-section	Rosgen (1996)	Identify at least 1 survey unit within a reach of 20-30 bankfull widths long in each Class I and II streams. Establish at least 3 transects across the bankfull channel in each survey unit and collect evenly spaced measurements of the depth to channel along each transect. The transect should be marked for return at subsequent samplings.	At least once every three years
Thalweg profile	Dunne and Leopold (1976)	Identify at least 1 survey unit within a reach of at least 20-30 bankfull widths long in each Class I and II streams. Survey units must be no less than 30 times the bankfull channel width with 3-4 meanders within the survey unit.	At least once every three years
Miles of open stream channel	Grant (1988)	Modified RAPID analysis measuring linear distance of open stream channels from aerial photographs.	At least once every ten years
Flow and/or stage height	Gordon, et. al. (1992)	Measurements or estimates determined during instream sampling. Continuous measurements are desirable but require sophisticated equipment that is vulnerable to damage. Point measurements of stage height during storm event and routinely through the year are more manageable.	Ongoing

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
Rainfall		Daily measurement using a gage with a sensitivity of 0.1 inch.	Ongoing
HILLSLOPE MONITORING			
Landslides, fluvial, and surface erosion associated with roads, landings and skid trails	Pacific Watershed Associates or similar method	Road inventory; identification of existing and potential sediment delivery sites; measurement or estimation of volume of sediment associated with each site.	Annual
Landslides associated with harvest units	Timber, Fish and Wildlife (Washington State)	Aerial photographs; identification of landslide features associated with timber harvest units; measurement of the area of the landslide feature; estimate of the volume of sediment delivered to the stream from each feature.	Annual
Landslides, fluvial, and surface erosion associated with agricultural activities	Any defensible method	Property survey; identification of existing and potential erosion problems; measurement or estimation of volume of sediment associated with each site or situation.	Annual
Stream crossing failures	Pacific Watershed Associates or similar method	Road survey after storms with a 20 year recurrence interval or greater; identify location of failed or partially failed crossings; measurement or estimation of volume of sediment associated with failure.	Once in summer of years having storms with a 20 year recurrence interval, or greater

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PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
Density of unpaved roads	Any defensible method	GIS and/or THP data review; cumulative tally of miles of road per tributary or Planning Watershed, the average width of the road system, and the density of unpaved roads.	At least once every ten years

6.3.3.8 Estimated Total Cost and Potential Sources of Funding

An estimated cost to implement the sedimentation reduction efforts described in the Action Plan is \$5 million plus unquantified costs which include inventory costs and the opportunity cost of the volume of unharvested timber, up to an additional \$2 million. Potential training and financing resources available to landowners include but are not limited to the Wildlife Habitat Incentive Program (WHIP), the Environmental Quality Incentives Program (EQIP), the Conservation Reserve Program (CRP), the Salmon and Steelhead Restoration Program (SSRP), the Forestry Incentive Program (FIP), the Salmon and Steelhead Restoration Account (SSRA), and Clean Water Act Section 205(j) and Section 319(h) funding.

6.3.3.9 Plan for Future Review of the Strategy

Public participation was a key element in the development of the Strategy and will continue to be an essential component in its implementation. Interested persons will have the opportunity to comment on the progress of the Action Plan at watershed meetings, and to the North Coast Water Board at least once every 3 years, at which time the North Coast Water Board shall determine if there is sufficient progress toward implementation of erosion control and management activities, as well as movement towards attainment of the Numeric Targets described in the Action Plan. If sufficient progress as described above is not documented, the North Coast Water Board will consider revising the Action Plan through a Basin Plan amendment. If the North Coast Water Board concludes that the Numeric Targets are being attained throughout a Planning watershed, it may consider suspending or terminating some or all of the Action Plan for landowners within that Planning watershed.

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6.3.4 Action Plan for the Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in the Klamath River in California and Lost River Implementation Plan⁷³

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

This Action Plan for the Klamath River TMDLs (Action Plan) includes temperature, dissolved oxygen, nutrients, organic matter, and microcystin total maximum daily loads (TMDLs) for the Middle and Lower Hydrologic Areas of the Klamath River, and references the Lower Lost River TMDLs established by the United States Environmental Protection Agency (U.S. EPA).

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

6.3.4.1 Problem Statement

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

Dissolved oxygen concentrations are regularly too low to comply with the Basin Plan dissolved oxygen objectives. Water temperature conditions regularly exceed temperature thresholds protective of salmonids. Low dissolved oxygen concentrations and elevated water temperatures in the Klamath River, its tributaries, Copco 1 and Copco 2, and Iron Gate Reservoirs, and seasonal algae blooms have resulted in degraded water quality conditions that do not meet applicable water quality objectives and that impair designated

⁷³ Adopted by the North Coast Regional Water Quality Control Board on March 24, 2010. Approved by the State Water Resources Control Board on September 7, 2010. Approved by the State Office of Administrative Law on December 7, 2010. Approved by the United States Environmental Protection Agency on December 28, 2010.

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beneficial uses. The designated beneficial uses that are not fully supported include: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); Native American cultural use (CUL); subsistence fishing (FISH); and contact and non-contact water recreation (REC-1 and REC-2).

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

6.3.4.2 Watershed Restoration Efforts

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

On February 18, 2010, participants in the Klamath settlement process signed the Klamath Basin Restoration Agreement (KBRA) and Klamath Hydroelectric Settlement Agreement (KHSa). The KBRA is intended to result in effective and durable solutions which will: 1) restore and sustain natural fish production and provide for full participation in ocean and river harvest opportunities of fish species throughout the Klamath Basin; 2) establish reliable water and power supplies which sustain agricultural uses, communities, and National Wildlife Refuges; and 3) contribute to the public welfare and the sustainability of all Klamath Basin communities.

The KHSa lays out the process for additional studies, environmental review, and a decision by the Secretary of the Interior (Secretarial Determination) regarding whether removal of four dams owned by PacifiCorp: 1) will advance restoration of the salmonid fisheries of the Klamath Basin; and 2) is in the public interest, which includes but is not limited to consideration of potential impacts on affected local communities and tribes. The four dams are Iron Gate, J.C. Boyle, Copco 1 and Copco 2 dams on the Klamath River. The KHSa includes provisions for the interim operation of the dams and the process to transfer, decommission, and remove the dams (Summary of Klamath Basin Settlement Agreements, 2010).

6.3.4.3 Temperature

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A. Klamath River Temperature Source Analysis

The Klamath River Watershed Temperature TMDL addresses the heat loads that arise from seven sources:

1. Conditions of Klamath River water crossing the Oregon-California border (Stateline).
2. Thermal discharges from Copco 2 and Iron Gate Reservoirs.
3. The impoundment of water in the Copco 1, Copco 2, and Iron Gate Reservoirs.
4. Temperature effects of Iron Gate Hatchery.
5. Temperature effects of major tributaries on Klamath River temperatures.
6. Effects of excess solar radiation.
7. Effects of excess⁷⁴ (anthropogenic) sediment loads.

B. Klamath River Temperature TMDL

The Klamath River Temperature TMDL is set equal to the loading capacity. The loading capacity is the maximum amount of pollutant loading that can occur while still achieving water quality objectives and protecting beneficial uses. For the temperature TMDL the water quality objective of concern is the temperature objective, which prohibits the alteration of the natural receiving water temperature unless such alteration does not adversely affect beneficial uses. The loading capacity provides a reference for calculating the amount of pollutant load reduction needed to bring a waterbody into compliance with standards. The starting point for the load allocation analysis is the equation that describes the total maximum daily load or loading capacity:

$$\text{TMDL} = \text{Loading Capacity} = \Sigma \text{WLAs} + \Sigma \text{LAs} + \text{Natural Background} + \text{MOS}$$

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

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

$$\begin{aligned} \text{Temperature TMDL} &= \text{Loading Capacity} \\ &= 0 \text{ increase over natural temperatures}^{75} \\ &= 0 \text{ anthropogenic heat load at Stateline} \\ &+ 0 \text{ heat load discharge from Copco 2 and Iron Gate Reservoirs} \end{aligned}$$

⁷⁴ Excess sediment is defined herein as soil, silt, sand, clay or other similar material rock, and/or sediments (e.g. sand silt, sand, or clay) discharged to waters of the state in an amount that could be deleterious to beneficial uses or cause a nuisance.

⁷⁵ Natural temperatures are those water temperatures that exist in the absence of anthropogenic influences, and are equal to natural background.

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- + 0 heat load discharge from Iron Gate Hatchery
- + 0 heat load discharge from tributaries
- + 0 heat load from excess solar radiation
- + 0 heat load from anthropogenic sediment loads
- + natural background
- = natural background

C. Klamath River Temperature Load Allocations

In accordance with the Clean Water Act, the Klamath River Temperature TMDL is allocated to the sources of elevated temperature in the watershed. The Iron Gate Fish Hatchery is the one point-source heat load in the Klamath River Watershed. The interstate water quality objective for temperature prohibits the discharge of thermal waste to the Klamath River, and therefore the waste load allocation for Iron Gate Hatchery is set to zero, as monthly average temperatures. The TMDL addresses elevated temperatures from natural and nonpoint anthropogenic sources. The nonpoint sources include: (1) excess solar radiation, expressed as its inverse, shade; (2) heat loads associated with increased sediment loads; (3) heat loading from impoundments; and (4) heat loads from Oregon. The assigned load allocations for temperature are expressed in Table 6-11.

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

The Klamath River Temperature TMDL for California relies on an implicit margin of safety. The intrastate water quality objective for temperature allows for temperature increases of up to 5°F if beneficial uses of water are not adversely affected. For much of the year the instream temperature of the Klamath River is too hot to accommodate more heat loading without beneficial uses of water being adversely affected. There are periods in the winter and spring months, however, when temperature increases of up to 5°F may occur without beneficial uses of water being adversely affected. The timing of those periods predict. Therefore, this TMDL takes a conservative approach, allocating no temperature increases year-round. This conservative approach constitutes an implicit margin of safety.

To account for annual and seasonal variability, the Klamath River Temperature TMDL analysis evaluated temperatures and thermal processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for temperature, described above, which do not allow for temperature increases during any part of the year. changes from year to year and is difficult to predict. Therefore, this TMDL takes a conservative approach, allocating no temperature increases year-round. This conservative approach constitutes an implicit margin of safety.

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

6.3.4.4 Dissolved Oxygen

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A. Klamath River Dissolved Oxygen Source Analysis

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

- Stateline: Waters entering California from Oregon at Stateline, which includes the Williamson and Sprague River watersheds, Upper Klamath Lake, the Lost River watershed that drains the USBR’s Klamath Project and includes one municipal point source in California, municipal and industrial point sources to the Klamath River in Oregon, and Klamath River waters passing through Keno and JC Boyle Reservoirs. Oregon’s Klamath River TMDL source analysis evaluates the contributions from these discrete sources on the water quality of the Klamath River in Oregon.
- Klamath Hydroelectric Project facilities in California: Copco 1 and 2 and Iron Gate Reservoirs – Copco 1 and 2 Reservoirs are treated as a single source for the purposes of this TMDL.
- Iron Gate Hatchery.
- Tributaries: Four individual rivers (Shasta, Scott, Salmon, and Trinity rivers) are included as discrete source areas, while groups of smaller creeks are combined into six additional source areas (Stateline to Iron Gate Dam reach tributaries, Iron Gate Dam to Shasta River, Shasta River to Scott River, Scott River to Salmon River, Salmon River to Trinity River, and Trinity River to Turwar Creek).

Table 6-10: Temperature Load Allocations⁷⁶

Source	Allocation
Excess Solar Radiation (expressed as effective shade)	The shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.
Increased Sediment Loads	Zero temperature increase caused by substantial human-caused sediment-related channel alteration. ⁷⁷

⁷⁶ These allocations are assigned to the Klamath River Middle and Lower Hydrologic Areas. Major tributaries are not assigned temperature allocations because the Scott, Shasta and Salmon River watersheds already have assigned allocations, and the Lost and Trinity Rivers are not listed as impaired for temperature.

⁷⁷ Substantial human-caused sediment-related channel alteration: A human-caused alteration of stream channel dimensions that increases channel width, decreases depth, or removes riparian vegetation to a degree that alters stream temperature dynamics and is caused by increased sediment loading.

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Table 6-10: Temperature Load Allocations⁷⁶

Source	Allocation
Impoundment Discharges	Zero temperature increase above natural temperatures. ⁷⁸
Reservoirs	See dual temperature - dissolved oxygen allocation, below in Section IV. C.
Klamath River at Stateline	Zero increase above natural temperatures.

B. Klamath River Dissolved Oxygen TMDL

The TMDLs addressing dissolved oxygen and nutrient-related water quality impairments, including microcystin, are closely interrelated because of the strong relationship between biostimulatory conditions, decomposition of organic matter, and resulting dissolved oxygen conditions. The Klamath River TMDLs for California are calculated to attain and maintain Site Specific Objectives (SSOs) for dissolved oxygen in the Klamath River in California. The SSOs for dissolved oxygen and associated dissolved oxygen load allocations are the primary driver in establishing the nutrient and organic matter loading capacity for the river reaches of the Klamath River in California. Stateline and tributary allocations for the nutrients (total nitrogen (TN) and total phosphorus (TP)) and organic matter (CBOD)⁷⁹ were set to ensure that the site-specific dissolved oxygen objectives are met in the river reaches in California. Thus, achievement of the Klamath River Nutrient and Organic Matter TMDL constitutes achievement of the Klamath River Dissolved Oxygen TMDL, except in Copco 1 and 2 and Iron Gate Reservoirs, which were assigned additional nutrient load allocations, as described below.

C. Klamath River Dissolved Oxygen Load Allocations

Achievement of the nutrient and organic matter allocations at Stateline and the tributary nutrient and organic matter allocations will not result in compliance with the dissolved oxygen and temperature load allocations within Copco 1, Copco 2, and Iron Gate Reservoirs during periods of thermal stratification. Therefore, additional dissolved oxygen load allocations are assigned to the reservoirs for the period of May through October to ensure compliance with the SSOs for dissolved oxygen and temperature objectives within the reservoirs, and ensure support of the cold freshwater habitat (COLD) beneficial use.

The temperature and dissolved oxygen allocations for waters within Copco 1, Copco 2, and Iron Gate Reservoirs are dual allocations, wherein achievement of the water quality objective for temperature must coincide with dissolved oxygen conditions compliant with

⁷⁸ The temperature allocations for the discharges from Copco 1 and 2 and Iron Gate Reservoirs are based on the natural increase in water temperature within the river reaches occupied by those reservoirs, and assessed based on monthly average temperatures.

⁷⁹ The allocations for organic matter are expressed as CBOD, and refer to CBOD-ultimate. The water quality models represent CBOD as organic matter; it is converted to CBOD-ultimate for TMDL allocation calculations.

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the SSOs for dissolved oxygen, and vice versa. Allocations for dissolved oxygen and temperature equate to a “compliance lens” where both dissolved oxygen and temperature conditions meet objectives for water temperature and dissolved oxygen and are therefore protective of the COLD and MIGR beneficial uses.

The allocation applies during the critical period of May 1st through October 31st and requires that dissolved oxygen concentrations be consistent with the SSOs for dissolved oxygen included in Table 3-1a, Waterbody Specific Objectives for Dissolved Oxygen in the Mainstem Klamath River, and overlap temperatures consistent with natural water temperatures at the point of entry to the reservoirs within a lens throughout the reservoir, or alternative in-reservoir temperature and dissolved oxygen conditions that provide equal or better protection of COLD and MIGR.

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

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

To account for annual and seasonal variability, the Klamath River Dissolved Oxygen TMDL analysis evaluated dissolved oxygen processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for nutrients and organic matter which are set to ensure that the site-specific dissolved oxygen objectives are met in the river reaches in California. The margin of safety for the Dissolved Oxygen TMDL is an implicit margin of safety as described in Section V.D.

6.3.4.5 Nutrient and Organic Matter

A. Klamath River Nutrient and Organic Matter Source Analysis

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

B. Klamath River Nutrient and Organic Matter TMDLs

The nutrient TMDLs are expressed in terms of total phosphorus (TP) and total nitrogen (TN). The organic matter TMDL is expressed in terms of carbonaceous biochemical oxygen demand or CBOD⁸⁰.

The nutrient and organic matter TMDLs for the Klamath River in California are equal to the sum of waste load allocations, load allocations, and natural background loads for each parameter. The only waste load allocation assigned for these TMDLs is to the Iron Gate Hatchery. The contribution of natural background TP, TN, and CBOD loads are

⁸⁰ CBOD is converted to CBOD-ultimate for TMDL allocation calculations. CBOD-ultimate is a measurement of oxygen consumed after sixty to ninety days of incubation.

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incorporated into the load allocations for each source area. Accordingly, the TMDL equations for TP, TN, and CBOD take the form of the following equation:

TP, TN, and CBOD TMDLs = Loading Capacity = Σ WLAs + Σ LAAs where Σ = the sum, WLAs = waste load allocations, and LAAs = load allocations.

The TP TMDL for the Klamath River in California equals 1,845 pounds per day. The TN TMDL for the Klamath River in California equals 14,985 pounds per day. The CBOD TMDL for the Klamath River in California equals 143,019 pounds per day.

C. Klamath River Nutrient and Organic Matter Load Allocations

The loading capacity and associated load and waste load allocations for TP, TN, and organic matter (CBOD) for the Klamath River in California, including Copco 1, Copco 2, and Iron Gate Reservoirs, are expressed in lbs/day, and are presented in Table 6-12.

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

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

Conservative assumptions that make up the implicit margin of safety are as follows:

- The numeric model used to predict the impact of allocations assumes that sediment oxygen demand (SOD) does not improve in the riverine sections following upstream load reductions. The magnitude of SOD will likely decrease with the decrease of organic loading allocated by the TMDL, and result in increased dissolved oxygen concentrations over time. Predicted conditions in the Klamath River are strongly influenced by the predicted variable conditions of the Upper Klamath Lake TMDL. Conservative allocations were set by using a combination of the predicted conditions. The timing of the allocations within Oregon is based on the scenario which represents the greatest loading from Upper Klamath Lake (i.e. results in the longest period of water quality not meeting numeric criterion). The magnitudes of the allocations are based on median loading conditions from Upper Klamath Lake. This is conservative because allocations are based on the difference from a baseline condition. The closer the concentration

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or temperature is to the numeric criteria, the less loading is necessary to cause a measurable degradation.

Table 6-11: Nutrient and Organic Matter Load Allocations (lbs/day)

Source Area	Daily TP Load Allocations (lbs.)	Daily TN Load Allocations (lbs.)	Daily CBOD Load Allocations (lbs.)
Stateline	245+	3,139+	19,067+
Upstream of Copco 1 Reservoir	(61)+	(330)+	(5,713)+
Stateline to Iron Gate Dam inputs	22+	339+	1,793+
Δ Iron Gate Hatchery	0+	0+	0+
Tributaries between Iron Gate Dam and the Shasta River	49+	317+	3,039+
Shasta River	75+	220+	2,406+
Tributaries between Shasta River and the Scott River	17+	97+	871+
Scott River	87+	1,279+	13,608+
Tributaries between Scott River and the Salmon River	187+	1,050+	9,423+
Salmon River	193+	1,583+	18,428+
Tributaries between Salmon River and the Trinity River	90+	504+	4,519+
Trinity River	762+	5,783+	66,571+
Tributaries between Trinity River and the Turwar Creek	179+	1,004+	9,007+
Total Maximum Daily Load	1,845	14,985	143,019

- An empirical analysis suggests that the TMDL model may underestimate nutrient loss and retention within the Klamath River. The underestimate does not appear to be large. However, this potential underestimate results in more conservative allocations upstream.
- The year chosen for developing the water quality models and establishing the TMDL was selected because it included periods of critical low flow and poor water quality conditions, which results in more stringent load allocations.
- Allocations to nonpoint sources are for all nutrients (TN, TP, and CBOD), not just the predicted limiting nutrient.
- Year 2000 flows are less than more recent flow requirements (i.e., USBR Klamath Project Operations and PacifiCorp Klamath Hydro Project Biological Opinion flows).

6.3.4.6 Microcystin

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A. Klamath River Microcystin Source Analysis

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

B. Load Allocations

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

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

and equate to the following annual reductions below the nutrient allocations at Stateline (to be achieved above Copco 1 Reservoir):

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

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

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

6.3.4.7 U.S. EPA-Approved Lower Lost River TMDL

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

6.3.4.8 Klamath River and Lost River Implementation Plan

This implementation plan describes the specific actions that the North Coast Water Board and other responsible parties shall implement to achieve the Klamath River and Lower Lost River TMDLs and meet temperature, dissolved oxygen, biostimulatory, and toxicity water quality standards in the Klamath River Basin. The implementation plan addresses sources of impairment throughout the Klamath River Basin, which includes the Lost River, the Shasta River, the Scott River, the Salmon River, the Trinity River, and all other tributary basins. The implementation plan gives consideration to the existing TMDL implementation plans in the Salmon, Scott, and Shasta basins.

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The implementation plan includes a prohibition on unauthorized discharges that violate water quality objectives, guidance on the control of sediment waste discharges, a Thermal Refugia Protection Policy, and implementation actions that are assigned to specific responsible parties as presented in Table 6-14.

A. Coordination with Oregon

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

B. Nonpoint Source Implementation

The implementation actions described in Table 6-14 are necessary to implement the 2004 Statewide Nonpoint Source Pollution Control Program (NPS Policy). The NPS Policy requires the North Coast Water Board to regulate all nonpoint source discharges of waste through some combination of regulatory tools that include Waste Discharge Requirements (WDRs), conditional waivers of WDRs, and Basin Plan prohibitions.⁸¹ For all currently unregulated nonpoint source discharges, the implementation plan directs the North Coast Water Board to develop one or more regulatory tools as needed to control nonpoint source discharges of waste and implement the TMDLs. The implementation plan encourages and builds upon on-going, proactive restoration and enhancement efforts in the watershed to the extent possible. Responsible parties that manage large land areas in the Klamath River Basin, such as the United States Forest Service, California Department of Transportation, and the Klamath River counties, are currently implementing land management programs that overlap several watersheds. For these parties, the North Coast Water Board intends to implement a consistent regionwide approach that streamlines compliance with all existing and future TMDLs and makes efficient use of staff resources. With these goals in mind, the implementation plan seeks to coordinate actions with the existing land management programs with the

⁸¹ The 2004 Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy).

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requirements of the Klamath TMDLs and regionwide nonpoint source program objectives whenever possible.

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

Discharges of waste that violate any narrative or numerical water quality objective that are not authorized by waste discharge requirements or other order or action by the North Coast Water Board or State Water Board are prohibited.

D. Guidance to Control Excess Sediment Discharges

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

1. Prevent: Plan, design, and implement the project or activity in such a way that no excess sediment discharge occurs or could occur to waters of the state.
2. Minimize: If the discharge or threatened discharge of excess sediment cannot be fully prevented, then plan, design, and implement the project in such a way that discharges to waters of the state are minimized to the maximum extent possible.

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

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).
2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
3. Schedule: Develop a schedule to implement the cleanup of excess sediment discharge sites.
4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules.

This guidance is suggestive only and in no way limits the enforcement authority of the North Coast Water Board under applicable law.

E. Thermal Refugia Protection Policy

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

1. Discharge Restriction In and Around Thermal Refugia

Parties conducting activities associated with suction dredging in the Klamath Basin are restricted from discharging waste in and around known thermal refugia within a specified instream buffer unless that activity is regulated by a separate regulatory mechanism such as WDRs, waiver(s) of WDRs, and/or a 401 water quality certification. The restriction applies April 15 to September 15 to protect thermal refugia when they are typically functioning in the mainstem Klamath River. The known thermal refugia locations are designated in Table 6-13 below.

Table 6-12: Tributaries to the Klamath River Known to Provide Thermal Refugia In and Around Their Confluence.

Tributaries		
Aikens Creek	Halverson Creek	Pine Creek
Aubrey Creek	Hopkins Creek	Portuguese Creek
Barkhouse Creek	Horse Creek	Red Cap Creek
Beaver Creek	Humbug Creek	Reynolds Creek
Blue Creek	Hunter Creek	Roach Creek
Bluff Creek	Ikes Creek	Rock Creek
Bogus Creek	Independence Creek	Rogers Creek
Boise Creek	Indian Creek	Rosaleno Creek
Boulder Creek ⁸²	Irving Creek	Sandy Bar Creek
Cade Creek	Kelsey Creek ²⁹	Salt Creek
Camp Creek	King Creek	Seiad Creek
Canyon Creek ³⁰	Kohl Creek	Slate Creek
Cappell Creek	Kuntz Creek	Stanshaw Creek
Cheenitch Creek	Ladds Creek	Swillup Creek
China Creek	Little Horse Creek	Ten Eyck Creek
Clear Creek	Little Humbug Creek	Thompson Creek
Coon Creek	Little Grider Creek	Thomas Creek
Crawford Creek (Humboldt Co.)	Lumgrey Creek	Ti Creek
Crawford Creek (Siskiyou Co.)	McGarvey Creek	Titus Creek
Dillon Creek	Mill Creek	Tom Martin Creek
Doggett Creek	Miners Creek	Trinity River
Dona Creek	McKinney Creek	Tully Creek
Donahue Flat Creek	Nantucket Creek	Ukonom Creek
Elk Creek	Negro Creek	Ullathorne Creek
Elliot Creek	Oak Flat Creek	Walker Creek
Empire Creek	O'Neil Creek	West Grider Creek
Fort Goff Creek	Pecwan Creek	Whitmore Creek
Grider Creek	Pearch Creek	Wilson Creek

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

⁸² Scott River tributary

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

A 3,000 foot buffer length is required in the following tributary creeks upstream of their confluence with the mainstem Klamath River:

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

A 1,500 foot buffer length is required in the mainstem Klamath River downstream of the confluence with the following tributary creeks:

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

2. Revising the Thermal Refugia List and Buffer Designations

The list of thermal refugia locations and/or buffer length designations may be revised through a public process. Persons proposing modification should submit supporting evidence to the Executive Officer. The North Coast Water Board may add or remove thermal refugia and/or buffer length designations after public notice and opportunity for public comment, and upon final approval of a Basin Plan amendment. The current list and maps showing locations of thermal refugia and designated buffer lengths will be maintained on the North Coast Water Board website at:

www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/
(http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/)

3. Policy Directives and Recommendations

- a. North Coast Water Board staff shall place heightened scrutiny on permits and 401 water quality certifications for activities that have the potential to impact the function of thermal refugia.
- b. The State Water Resources Control Board and the California Department of Fish and Wildlife should restrict discharges associated with suction dredging activities as specified by this policy. This directive in no way limits the permitting agency from implementing more stringent requirements.
- c. State Water Resources Control Board staff shall consider the impact of increased diversions in tributaries that provide thermal refugia when issuing water rights permits to divert surface water in the Klamath River Basin in California.
- d. It is recommended that large landowners and land managers in the Klamath River Basin prioritize restoration and water quality control efforts in tributary watersheds that provide or otherwise create thermal refugia.

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

F. Individual Implementation Plan Actions

The implementation plan actions are organized into Table 6-14 by source or land use activity and by the responsible party(ies) considered appropriate to implement TMDL actions. Responsible parties may find that more than one implementation action is applicable to their circumstances. For each action in Table 6-14, there is a corresponding timeframe, within which the responsible party is expected to implement the action. Action items are fully independent of each other and require 100% implementation within each Source or Land Use category identified in Table 6-14.

6.3.4.9 Enforcement

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

6.3.4.10 Monitoring

A. Compliance Monitoring

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

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Stateline Allocations</u></p> <p>North Coast Water Board</p> <p>Oregon (ODEQ)</p> <p>U.S. EPA 9 and 10</p>	<p><u>Action</u></p> <p>Work together to implement and monitor measures that will achieve compliance with the Klamath and Lost River TMDLs in Oregon and California as specified in the Klamath River/Lost River TMDL Implementation Memorandum of Agreement (MOA). The MOA includes commitments such as:</p> <ul style="list-style-type: none"> • Work to develop and implement a joint adaptive management program, including joint time frames for reviewing progress and considering adjustments to TMDLs. • Work with the Klamath Basin Monitoring Program (KBMP) and other appropriate entities to develop and implement basinwide monitoring programs designed to track progress, fill in data gaps, and provide a feedback loop for management actions on both sides of the common state border. • Work jointly with common implementation parties (e.g., USBR, U.S. Forest Service, USFWS, BLM, PacifiCorp, and the Klamath Water Users Association (KWUA) to develop effective implementation plans and achieve water quality standards. • Explore engineered treatment options such as treatment wetlands, algae harvesting, and wastewater treatment systems to reduce nutrient loads to the Klamath River and encourage implementation of these options where feasible. • Work to develop and implement a basinwide water quality tracking and accounting program that would establish a framework to track water quality improvements, facilitate planning and coordinated TMDL implementation, and enable appropriate water quality offsets or trades. <p><u>Timeline</u></p> <p>Ongoing</p>

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
<p>U.S. Bureau of Reclamation's Klamath Project</p> <p>North Coast Water Board</p> <p>US Bureau of Reclamation (USBR)</p> <p>US Fish and Wildlife Service (USFWS)</p> <p>Tulelake Irrigation District (TID)</p>	<p><u>Action</u></p> <p>Develop and implement a Management Agency Agreement (MAA) between USBR, USFWS, TID, and the North Coast Water Board that addresses the water quality impacts of the USBR's Klamath Project. The MAA should include the following action items:</p> <ul style="list-style-type: none"> • Complete a water quality study based on best available science to characterize the seasonal and annual nutrient and organic matter loading through USBR's Klamath Project and refuges. The study should be completed in time to inform the development of a water quality management plan described in the following bullet. • Based on the results of the water quality study, develop a water quality management plan to meet and/or offset the Lower Lost River and Klamath River TMDL allocations. The plan should be submitted to the Regional Water Board for approval by June 28, 2012. • Include a schedule with interim milestones for meeting the TMDL allocations and targets. • Coordinate implementation actions with other responsible parties discharging pollutants within USBR's Klamath Project and refuges. • Develop a monitoring and reporting program with the North Coast Water Board to evaluate the effectiveness of management measures and track progress towards meeting the Lower Lost River and Klamath River TMDL allocations and targets. • Coordinate with the Klamath River water quality improvement tracking and accounting program in implementing offset projects. • Periodically report to the North Coast Water Board on actions taken to implement the TMDL and progress towards meeting the TMDL allocations and targets. <p><u>Timeline</u></p> <p>Complete the MAA by June 28, 2011.</p>

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
<p>Klamath Hydroelectric Project</p> <p>PacifiCorp</p>	<p><u>Action</u> Submit a proposed implementation plan that incorporates timelines and contingencies pursuant to the KHSA. In the event that the KHSA does not move forward, the implementation plan should specify that the Federal Energy Regulatory Commission (FERC) 401 water quality certification process shall resume. Section 6.3.2 of the KHSA describes TMDL implementation to include a timeline for implementing management strategies, water quality-related measures in Appendix D, and Facilities Removal as the final measure. PacifiCorp may propose the use of offsite pollutant reduction measures (i.e., offsets or “trades”) to meet the allocations and targets in the context of the Interim measures 10 and 11 of the KHSA. The implementation plan should identify appropriate intervals whereby PacifiCorp will provide the North Coast Water Board updates on the status and progress of the plan, and provide adequate time for review so that select project(s) are ready for construction by the date of the Secretarial Determination. The implementation plan must provide for North Coast Water Board review of site specific environmental assessments of dam removal before the North Coast Water Board’s approval of that approach as a final TMDL compliance measure.</p> <p><u>Timeline</u> By February 26, 2010.</p> <p><u>Action</u> Implement measures to meet and/or offset TMDL allocations and targets as prescribed in the approved implementation plan.</p> <p><u>Timeline</u> As required by the approved implementation plan.</p>

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Klamath Hydroelectric Project State Water Resources Control Board	<u>Action</u> If applicable, process the 401 water quality certification for the FERC relicensing of the Klamath Hydroelectric Project to meet Basin Plan requirements, including Klamath River TMDL allocations and targets. This Action Plan is not intended to constrain the discretion of the State Water Board to determine, as appropriate, time periods required for various studies, options for interim requirements, and methods for final compliance. <u>Timeline</u> Pursuant to the FERC licensing process timeline.
Iron Gate Hatchery North Coast Water Board	<u>Action</u> Revise NPDES Permit No. CA0006688 and WDR No. R1-2000-17 to incorporate revised effluent limits to implement the TMDL wasteload allocations, and the recalculated site-specific objectives for dissolved oxygen, and to require that the responsible parties implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet TMDL allocations and targets on a compliance schedule. <u>Timeline</u> Bring revised permit to the North Coast Water Board for consideration by December 2011.
Iron Gate Hatchery PacifiCorp CDFW	<u>Action</u> Implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet and/or offset the Klamath River TMDL wasteload allocations and targets. <u>Timeline</u> As specified in the revised NPDES permit.
Tulelake Wastewater Treatment Plant North Coast Water Board	<u>Action</u> Revise NPDES Permit No. CA0023272 and WDR No. R1-2004-0075 to include a compliance schedule and ensure that the discharge requirements are consistent with the Basin Plan requirements and the Lower Lost River TMDL wasteload allocations. <u>Timeline</u> Bring revised permit to the North Coast Water Board for consideration by June 2012.

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Tulelake Wastewater Treatment Plant City of Tulelake	<u>Action</u> Implement measures to improve the water quality of discharges from Tulelake Wastewater Treatment Plant to meet the Lower Lost River TMDL wasteload allocations. <u>Timeline</u> As specified in the revised NPDES permit.
Trinity River Restoration Plan (TRRP) North Coast Water Board	<u>Action</u> Develop general Waste Discharge Requirements/401 water quality certification for TRRP mechanical restoration. <u>Timeline</u> 2010
Trinity River Restoration Plan US Bureau of Reclamation	<u>Action</u> Implement Trinity River Restoration Plan Record of Decision. <u>Timeline</u> Ongoing
Road Construction and Maintenance on County Lands North Coast Water Board	<u>Action</u> The North Coast Water Board shall consider adopting a resolution and accompanying waiver for maintenance of county roads certifying the Five Counties Salmonid Conservation Program (5C Program) if it complies with the TMDL and attains standards in accordance with California Impaired Waters Guidance. ⁸³ <u>Timeline</u> December 2010 <u>Action</u> In the event that a county does not show intent to implement the 5C Program, develop WDRs or a conditional waiver of WDRs for that county. <u>Timeline</u> June 2011

⁸³ In any resolution certifying that another entity's program will comply with the TMDL and attain standards, the North Coast Water Board must demonstrate in the resolution that the

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Road Construction and Maintenance of State Highway Facilities Caltrans	<p><u>Action</u> Implement the measures outlined above to control the discharge of excess sediment from their facilities and comply with the Klamath TMDL allocations even if measures are not incorporated into the statewide Caltrans permit.</p> <p><u>Action</u> Implement measures to meet the excess solar radiation allocation, even if measures are not incorporated into the statewide Caltrans permit.</p> <p><u>Action</u> Fully assess all barriers and potential barriers to migration caused by Caltrans road and highway facilities along the mainstem Klamath River and in the tributary watersheds identified in the Thermal Refugia Protection Policy. Develop a priority ranking and time schedule for modifying the identified fish passage barriers to accommodate free passage of fish upstream and downstream.</p> <p><u>Timeline</u> Caltrans shall submit annual reports to the North Coast Water Board documenting progress in implementing the above measures.</p>
Road Construction and Maintenance on County Lands Del Norte, Humboldt, Siskiyou, and Trinity Counties	<p><u>Action</u> Implement measures through the 5C Program.</p> <p><u>Timeline</u> Pursuant to the 5C Program timelines.</p>

implementing program is consistent with the assumptions and requirements of the TMDL, that sufficient mechanisms exist to provide reasonable assurances that the program will address the impairment in a reasonable period of time, and that sufficient mechanisms exist to ensure that the program will be enforced, or that the North Coast Water Board has sufficient confidence that the program will be implemented such that further regulatory action would be unnecessary and redundant. (A Process for Addressing Impaired Waters in California, SWRCB Resolution No. 2005-0050 (June 2005) found on page 6-10.)

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
<p>Road Construction and Maintenance of State Highway Facilities</p> <p>State Water Resources Control Board</p> <p>North Coast Water Board</p>	<p><u>Action</u> Incorporate the following measures into the NPDES Statewide Stormwater Permit and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans permit) to address sediment sources from road and highway facilities under Caltrans control:</p> <ol style="list-style-type: none"> 1. <u>Inventory</u>: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s). 2. <u>Prioritize</u>: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility. 3. <u>Schedule</u>: Develop a schedule to implement the cleanup of excess sediment discharge sites. 4. <u>Implement</u>: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge. 5. <u>Monitor and Adapt</u>: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules. <p><u>Action</u> Incorporate measures to meet the excess solar radiation allocation in the statewide Caltrans permit and 401 water quality certifications.</p> <p><u>Timeline</u> The revised permit is anticipated to be adopted by the State Water Resources Control Board by August 2010, with U.S. EPA adoption anticipated by December 2010.</p>

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Agricultural Activities on Non-Federal Lands North Coast Water Board	<p><u>Action</u> Develop a conditional waiver of WDRs for discharges associated with agricultural activities, including grazing and irrigated agriculture, in the Klamath River Basin. The conditional waiver shall require compliance with the Klamath River TMDL load allocations where they apply and will serve as the means of compliance with the Lower Lost River TMDL load allocations associated with agricultural sources.</p> <p><u>Timeline</u> North Coast Water Board staff shall propose the conditional waiver for North Coast Water Board consideration by December 2012.</p>
Agricultural Activities on Non-Federal Lands Responsible Parties (Any party conducting grazing activities or activities associated with irrigated agriculture that discharge waste or have the potential to discharge waste on non-federal land in the Klamath River Basin)	<p><u>Action</u> The North Coast Water Board recommends the following actions:</p> <ol style="list-style-type: none"> 1. Document past projects and current practices that address sources of pollution from their operations. 2. Organize into watershed groups to report to the North Coast Water Board as a group as part of the future waiver program. 3. Participate in the development of the conditional waiver through a Technical Advisory Group that will convene to develop the draft waiver by December 2011. 4. Attend water quality training on implementing management practices and/or water quality management plan development. <p><u>Timeline</u> From North Coast Water Board adoption of the Klamath River TMDL Action Plan until adoption of the conditional waiver addressing agricultural discharges.</p>

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Timber Harvest Activities on Non-Federal Lands North Coast Water Board	<u>Action</u> The North Coast Water Board shall adopt individual watershed-wide and ownership WDRs, in lieu of the general WDR or conditional waiver of WDRs, to achieve the TMDL load allocations and water quality standards as appropriate. <u>Action</u> North Coast Water Board staff shall make recommendations for additional measures to ensure the water quality objective for temperature is achieved during the timber harvest review process, if necessary. <u>Timeline</u> Ongoing
Timber Harvest Activities on Non-Federal Lands Responsible Parties (Any party conducting timber harvest activities that discharge waste or have the potential to discharge waste in the Klamath River Basin.)	<u>Action</u> Implement riparian management measures that meet the riparian shade allocations and water quality standards. Where the Forest Practice Rules, including the Anadromous Salmonid Protection Rules, are not sufficient to meet the TMDL allocations or water quality standards, implement additional measures as directed by North Coast Water Board staff during the timber harvest review process. <u>Timeline</u> Ongoing
All Activities on USFS Lands North Coast Water Board	<u>Action</u> Develop a conditional waiver of WDRs for nonpoint source activities on USFS lands that includes conditions that implement the Klamath TMDL. <u>Timeline</u> Develop for consideration by the North Coast Water Board by April 2010.

Table 6-13: Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
All Activities on Lands Managed by the USFS	<u>Action</u> Conduct land management activities in compliance with the waiver of WDRs when adopted.
USFS	<u>Timeline</u> As required in the waiver of WDRs.

B. Basinwide Monitoring

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

The objectives of the monitoring plan include:

- Assessment of water quality standards attainment.
- Verification of pollution source allocations.
- Calibration or modification of the model used in the TMDL analysis.
- Evaluation of progress towards meeting TMDL allocations.
- Evaluation of point and nonpoint source control implementation and effectiveness.
- Evaluation of instream water quality.
- Evaluation of temporal and spatial trends in water quality.
- Evaluation of the risk to public health related to cyanobacteria and cyanotoxin exposure.
- Evaluation of the functionality of thermal refugia in the Klamath River Basin.
- Provide data for the development of the Klamath River Basin water quality improvement tracking and accounting program.

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

6.3.4.11 Reassessment and Adaptive Management

The North Coast Water Board will review, reassess, and make any necessary revisions to this implementation plan. North Coast Water Board staff will report to the North Coast Water Board at least yearly on the status and progress of implementation activities, and the attainment of the Klamath TMDLs. Every five years, North Coast Water Board staff will

conduct a comprehensive and formal assessment of the effectiveness of the implementation plan. During reassessment, the North Coast Water Board will consider how effective the requirements of the TMDL implementation plan are at meeting the TMDLs, achieving water quality objectives, and protecting the beneficial uses of water in the Klamath River Basin.

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

A. Responsible Party Compliance

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

USBR, USFWS and TID

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

PacifiCorp

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

USFS

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

Timber Harvest

- Reporting through waivers and WDRs for timber harvest projects.

Agriculture

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

County Roads

- Compliance with 5 C Program.

State Roads

- Adherence to Guidance for Control of Excess Sediment Discharges.

- Incorporation of TMDL implementation measures into Statewide permit.
- Assess migration barriers.

6.3.5 Action Plan to Address Elevated Water Temperatures in the Mattole River Watershed

The U.S. EPA has established a Total Maximum Daily Load (TMDL) for elevated temperature in the Mattole River Watershed⁸⁴. The Mattole River Watershed Temperature TMDL has assigned temperature load allocations corresponding to solar radiation loads that occur when the riparian vegetation is at full potential growth conditions, with allowances for the effects of natural factors that act to reduce those potential growth conditions. The goal of this Action Plan is to establish actions that achieve those TMDL load allocations. The following actions constitute a program of implementation to achieve the Mattole River Watershed Temperature TMDL and are consistent with the *Policy for the Implementation of the Water Quality Objectives for Temperature*.

Table 6-14: Action Plan to Address Temperature Impairments in the Mattole River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
Timber Harvest Activities on Non-Federal Lands North Coast Water Board	Action North Coast Water Board staff shall make recommendations for additional measures to ensure the TMDL load allocations and water quality objectives for temperature are achieved during the timber harvest review process, as necessary. Timeline Ongoing
Timber Harvest Activities on Non-Federal Lands Parties conducting timber harvest activities that discharge waste or have the potential to discharge waste	Action Implement riparian management measures that meet the riparian shade allocations and water quality standards. Where the Forest Practice Rules are not sufficient to meet the TMDL allocations or water quality standards, implement additional measures as directed by North Coast Water Board staff during the timber harvest review process. Timeline Ongoing

⁸⁴ The *Mattole River Total Maximum Daily Loads for Sediment and Temperature* (2002) contains a problem statement, source analysis, numeric targets, load allocations, linkage analysis, and margin of safety. Please see the individual TMDL document for more information.

**Table 6-14: Action Plan to Address Temperature Impairments in the
Mattole River Watershed**

Source or Land Use Activity and Responsible Party	Implementation Actions
Agricultural Activities on Non-Federal Lands North Coast Water Board	<u>Action</u> Develop and implement the Agricultural Lands Discharge Program as a mechanism for compliance with temperature objectives. <u>Timeline</u> Upon adoption
Agricultural Activities on Non-Federal Lands Parties conducting activities associated with agriculture that discharge waste or have the potential to discharge waste on nonfederal land, except dairies.	<u>Action</u> Implement riparian management measures that meet the riparian shade load allocations and water quality standards. <u>Timeline</u> Ongoing <u>Action</u> Conduct land management activities in compliance with the Agricultural Lands Discharge Program when adopted. <u>Timeline</u> Upon adoption of the Agricultural Lands Discharge Program
Road Construction and Associated Maintenance on County Lands North Coast Water Board	<u>Action</u> Implement Order No. R1-2013-0004, <i>Waiver of Waste Discharge Requirements and General Water Quality Certification for County Road Management and Activities Conducted Under the Five Counties Salmonid Conservation Program In the Counties of Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity in The North Coast Region</i> (5C Waiver of WDRs). <u>Action</u> In the event that a county does not show intent to implement the 5C Waiver of WDRs, develop WDRs or a conditional waiver of WDRs for that county. <u>Timeline</u> Ongoing

**Table 6-14: Action Plan to Address Temperature Impairments in the
Mattole River Watershed**

Source or Land Use Activity and Responsible Party	Implementation Actions
Road Construction and Maintenance on County Lands Humboldt and Mendocino Counties	<u>Action</u> Conduct road construction and maintenance in compliance with the 5C Waiver of WDRs. <u>Timeline</u> Pursuant to the 5C Waiver of WDRs timelines.
Dredge and Fill Activities in Waters of the State North Coast Water Board	<u>Action</u> Incorporate measures to meet the temperature allocations in 401 water quality certifications. <u>Timeline</u> Ongoing
Waste Discharge Requirement Program North Coast Water Board	<u>Action</u> Incorporate measures to meet the temperature allocations and water quality objectives for temperature in Waste Discharge Requirements and Waivers thereof. <u>Timeline</u> Ongoing
Water Use North Coast Water Board State Water Resources Control Board, Division of Water Rights	<u>Action</u> Work with other agencies and non-governmental organizations to support off-stream storage projects for water diverters currently diverting directly from streams during summer. Work with other agencies and non-governmental organizations to streamline permitting process for conversion of on-stream to off-stream storage. <u>Timeline</u> Ongoing

**Table 6-14: Action Plan to Address Temperature Impairments in the
Mattole River Watershed**

Source or Land Use Activity and Responsible Party	Implementation Actions
Water Use Water users	<u>Action</u> The North Coast Water Board encourages all water users to implement water conservation practices and develop off-stream storage facilities to minimize water diversions during low flow periods. <u>Timeline</u> Ongoing
Water Use North Coast Water Board State Water Resources Control Board, Division of Water Rights	<u>Action</u> <ul style="list-style-type: none"> • Pursue instream flow studies, including the following actions: • Work with other agencies and non-governmental organizations to support instream flow studies to: (1) quantify flows necessary for beneficial use support, (2) quantify flow impacts to assist outreach and education efforts, or (3) identify opportunities to increase summer low flows. • Coordinate with the California Department of Fish and Wildlife on the development, methodologies, and any criteria relevant to instream flow studies. • Consider all sources of water, including headwaters, groundwater, and waters flowing in subterranean streams. <u>Timeline</u> Until complete
Water Use North Coast Water Board State Water Resources Control Board, Division of Water Rights	<u>Action</u> Support third-party efforts to address temperature related concerns, including: Education of water users on the importance of water conservation efforts, Education of water users on water conservation practices and opportunities, Assistance for water users in the implementation of water conservation practices, Restoration of riparian vegetation, Other efforts that address water temperature-related concerns. <u>Timeline</u> Ongoing

Table 6-14: Action Plan to Address Temperature Impairments in the Mattole River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
Water Use North Coast Water Board State Water Resources Control Board, Division of Water Rights	<u>Action</u> <ul style="list-style-type: none"> • Take actions to address the temperature impacts of cannabis cultivation, through the following: • Outreach and education, • Grant support for water conservation and pollution control efforts, • Coordination with other agencies, • Enforcement actions. <u>Timeline</u> Ongoing
Water Use North Coast Water Board	<u>Action</u> Continue to coordinate with the State Water Board's Division of Water Rights by participating in the water right application and petition process, providing monitoring recommendations, conducting joint inspections as appropriate, submitting data in support of 401 certifications related to water diversions and/or facilities regulated by the FERC, participating in instream flow studies, participating in proceedings related to instream flow, and any other appropriate means to help ensure that the terms of water right permits and licenses are consistent with the intrastate water quality objective for temperature. <u>Timeline</u> Ongoing

6.3.6 Action Plan to Address Elevated Water Temperatures in the Navarro River Watershed

The U.S. EPA has established Total Maximum Daily Loads (TMDL) for elevated temperature in the Navarro⁸⁵. The Navarro River Watershed Temperature TMDL has assigned temperature load allocations corresponding to solar radiation loads that occur when the riparian vegetation is at full potential growth conditions, with allowances for the effects of natural factors that act to reduce those potential growth conditions. The goal of this Action

⁸⁵ The *Navarro River Total Maximum Daily Loads for Temperature and Sediment* (2000) contains a problem statement, source analysis, numeric targets, load allocations, linkage analysis, and margin of safety. Please see the TMDL and supporting documents for more information.

Plan is to establish actions that achieve those TMDL load allocations. The Navarro River Watershed Temperature TMDL also identifies the alteration of flow as a factor that may elevate water temperatures in some situations, and sets a target of no increases in diverted flows unless it can be demonstrated that the flow reduction will not increase water temperatures. The following actions constitute a program of implementation to achieve the Navarro River Watershed Temperature TMDL and are consistent with the *Policy for the Implementation of the Water Quality Objectives for Temperature*.

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
Timber Harvest Activities on Non-Federal Lands North Coast Water Board	<u>Action</u> North Coast Water Board staff shall make recommendations for additional measures to ensure the TMDL load allocations and water quality objectives for temperature are achieved during the timber harvest review process, as necessary. <u>Timeline</u> Ongoing
Timber Harvest Activities on Non-Federal Lands Parties conducting timber harvest activities that discharge waste or have the potential to discharge waste.	<u>Action</u> Implement riparian management measures that meet the riparian shade allocations and water quality standards. Where the Forest Practice Rules are not sufficient to meet the TMDL allocations or water quality standards, implement additional measures as directed by North Coast Water Board staff during the timber harvest review process. <u>Timeline</u> Ongoing
Agricultural Activities on Non-Federal Lands North Coast Water Board	<u>Action</u> Develop and implement the Agricultural Lands Discharge Program as a mechanism for compliance with temperature objectives. <u>Timeline</u> Upon adoption

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p>Agricultural Activities on Non-Federal Lands</p> <p>Parties conducting activities associated with agriculture that discharge waste or have the potential to discharge waste on nonfederal land, except dairies.</p>	<p><u>Action</u> Implement riparian management measures that meet the riparian shade load allocations and water quality standards.</p> <p><u>Timeline</u> Ongoing</p> <p><u>Action</u> Conduct land management activities in compliance with the Agricultural Lands Discharge Program when adopted.</p> <p><u>Timeline</u> Upon adoption of the Agricultural Lands Discharge Program</p>
<p>Road Construction and Maintenance of State Highway Facilities</p> <p>State Water Resources Control Board</p> <p>North Coast Water Board</p>	<p><u>Action</u> Implement the NPDES Statewide Storm Water Permit and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans permit).</p> <p><u>Timeline</u> Ongoing</p>
<p>Road Construction and Maintenance of State Highway Facilities</p> <p>Caltrans</p>	<p><u>Action</u> Conduct road construction, maintenance and associated activities in compliance with the Caltrans permit.</p> <p><u>Timeline</u> Ongoing</p>

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p>Road Construction and Associated Maintenance on County Lands</p> <p>North Coast Water Board</p>	<p><u>Action</u> Implement Order No. R1-2013-0004, <i>Waiver of Waste Discharge Requirements and General Water Quality Certification for County Road Management and Activities Conducted Under the Five Counties Salmonid Conservation Program In the Counties of Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity in The North Coast Region</i> (5C Waiver of WDRs) and any future revisions.</p> <p><u>Action</u> In the event that a county does not show intent to implement the 5C Waiver of WDRs, develop WDRs or a conditional waiver of WDRs for that county.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Road Construction and Maintenance on County Lands</u></p> <p>Mendocino County</p>	<p><u>Action</u> Conduct road construction and maintenance in compliance with the 5C Waiver of WDRs.</p> <p><u>Timeline</u> Pursuant to the 5C Waiver of WDRs timelines</p>
<p><u>Dredge and Fill Activities in Waters of the State</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Incorporate measures to meet the temperature allocations in 401 water quality certifications.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Waste Discharge Requirement Program</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Incorporate measures to meet the temperature allocations and water quality objectives for temperature in Waste Discharge Requirements and Waivers thereof.</p> <p><u>Timeline</u> Ongoing</p>

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Work with other agencies and non-governmental organizations to support off-stream storage projects for water diverters currently diverting directly from streams during summer. Work with other agencies and non-governmental organizations to streamline the permitting process for conversion of on-stream to off-stream storage.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>Water users</p>	<p><u>Action</u> The North Coast Water Board encourages all water users to implement water conservation practices and develop off-stream storage facilities to minimize water diversions during low flow periods.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Pursue instream flow studies, including the following actions:</p> <ul style="list-style-type: none"> • Work with other agencies and non-governmental organizations to support instream flow studies to: (1) quantify flows necessary for beneficial use support, (2) quantify flow impacts to assist outreach and education efforts, or (3) identify opportunities to increase summer low flows. • Coordinate with the California Department of Fish and Wildlife on the development, methodologies, and any criteria relevant to instream flow studies. • Consider all sources of water, including headwaters, groundwater, and waters flowing in subterranean streams. <p><u>Timeline</u> Until complete</p>

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Support third-party efforts to address temperature related concerns, including:</p> <ul style="list-style-type: none"> • Education of water users on the importance of water conservation efforts, • Education of water users on water conservation practices and opportunities, • Assistance for water users in the implementation of water conservation practices, • Restoration of riparian vegetation, • Other efforts that address water temperature-related concerns. <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>North Coast Water Board</p> <p>State Water Resources Control Board, Division of Water Rights</p>	<p><u>Action</u> Take actions to address the temperature impacts of cannabis cultivation, through the following: Outreach and education, Grant support for water conservation and pollution control efforts, Coordination with other agencies, Enforcement actions.</p> <p><u>Timeline</u> Ongoing</p>
<p><u>Water Use</u></p> <p>North Coast Water Board</p>	<p><u>Action</u> Continue to coordinate with the State Water Board's Division of Water Rights by participating in the water right application and petition process, providing monitoring recommendations, conducting joint inspections as appropriate, submitting data in support of 401 certifications related to water diversions and/or facilities regulated by the FERC, participating in instream flow studies, participating in proceedings related to instream flow, and any other appropriate means to help ensure that the terms of water right permits and licenses are consistent with the intrastate water quality objective for temperature.</p>

Table 6-15: Actions to Address Temperature Impairments in the Navarro River Watershed

Source or Land Use Activity and Responsible Party	Implementation Actions
	<u>Timeline</u> Ongoing
<u>Water Use</u> State Water Resources Control Board, Division of Water Rights	<u>Action</u> Achieve the Flow and Temperature target contained in the Navarro River Watershed Temperature TMDL through implementation of the <i>Policy for Maintaining Instream Flows in Northern California Coastal Streams</i> . <u>Timeline</u> Ongoing

6.3.7 Action Plan for the Scott River Sediment and Temperature Total Maximum Daily Loads⁸⁶

The Scott River Watershed, (CalWater Hydrologic Area 105.40), comprises approximately 520,184 acres (813 mi²) in Siskiyou County. The Scott River is tributary to the Klamath River.

The *Action Plan for the Scott River Sediment and Temperature Total Maximum Daily Loads*, hereinafter known as the Scott River TMDL Action Plan, includes sediment and temperature total maximum daily loads (TMDLs) and describes the implementation actions necessary to achieve the TMDLs and attain water quality standards in the Scott River Watershed within 40 years of United States Environmental Protection Agency approval of the Scott River TMDL Action Plan.

The goal of the Scott River TMDL Action Plan is to achieve the TMDLs, and thereby achieve sediment and temperature related water quality standards, including the protection of the beneficial uses of water in the Scott River Watershed.

⁸⁶ Adopted by the North Coast Regional Water Quality Control Board on December 7, 2005. Adopted by the State Water Resources Control Board on June 21, 2006. Approved by the State Office of Administrative Law on August 11, 2006. Approved by the United States Environmental Protection Agency on September 8, 2006.

The Scott River TMDL Action Plan sets out the loads and directs conditions to be considered and incorporated into regulatory and non-regulatory actions in the Scott River Watershed. The Scott River TMDL Action Plan is not directly and independently enforceable, except as incorporated into appropriate permitting or enforcement orders.

A glossary defining key terms is located in section 6.3.7.9.

6.3.7.1 Problem Statement

Excessive sediment loads and elevated water temperatures in the Scott River and its tributaries have resulted in degraded water quality conditions that impair designated beneficial uses, including contact (REC-1) and non-contact water recreation (REC-2); commercial and sport fishing (COMM); cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); and spawning, reproduction, and/or early development of fish (SPWN). Excessive sediment loads have resulted in the non-attainment of water quality objectives for sediment, suspended material, and settleable material. Elevated water temperatures have resulted in the non-attainment of the water quality objective for temperature. Excessive sediment loads and elevated water temperatures have adversely affected the beneficial uses associated with the cold water salmonid fishery. The Scott River Watershed has been listed as impaired with relation to sediment since 1992, and impaired with relation to temperature since 1998, pursuant to Section 303(d) of the Clean Water Act.

6.3.7.2 Watershed Restoration Efforts

Throughout the Scott River Watershed, many individuals, groups, and agencies have been working to enhance and restore fish habitat and water quality. These groups include, but are not limited to, the Siskiyou Resource Conservation District, the Scott River Watershed Council, the French Creek Watershed Advisory Group, private timber companies, Siskiyou County and the Five Counties Salmon Conservation Process, the California Department of Fish and Wildlife, the California Department of Water Resources, the United States Forest Service, and the Klamath River Basin Fisheries Task Force. The past and present proactive efforts of these stakeholders have improved, and will continue to improve, water quality conditions in the Scott River and its tributaries.

6.3.7.3 Sediment

A. Scott River Sediment Source Analysis

The sediment source analysis identifies the various sediment delivery processes and sources in the Scott River Watershed and estimates delivery from these sources. The results of the sediment source analysis are located in Table 6-17.

B. Scott River Sediment TMDL

The sediment TMDL for the Scott River Watershed is 550 tons of sediment per square mile per year. The sediment TMDL is the estimate of the total amount of sediment, from both natural and anthropogenic sources, that can be delivered to a water body without

causing non-attainment of applicable water quality standards. The TMDL is to be evaluated as a ten-year, rolling-average of the annual sediment yield.

C. Scott River Sediment Load Allocations

In accordance with the Clean Water Act, the Scott River sediment TMDL is allocated to the sources of sediment in the watershed. The load allocations are located in Table 6-18.

The load allocations are expressed as averages over the entire Scott River Watershed and are to be evaluated on a ten-year, rolling-average basis. Each square mile is not expected to meet the load allocations within a particular source category. Rather, it is expected that the average for the entire source category will meet the load allocation for that category.

D. Scott River Sediment Margin of Safety

The TMDL includes an implicit margin of safety, based on conservative assumptions, to account for uncertainties in the analysis. The conservative assumptions include (1) underestimating sediment delivery from natural soil creep because available information did not indicate all streams; and (2) underestimating the age of small streamside sediment sources, which results in higher annual rates of sediment delivery from these sources.

E. Scott River Sediment Seasonal Variations & Critical Conditions

To account for annual and seasonal variability in sediment delivery events, sediment delivery mechanisms, and storm patterns in the Scott River Watershed, the TMDL and load allocations apply to sources of sediment, not the movement of sediment across the landscape.

To account for critical conditions in stream flow, sediment loading, and water quality, the TMDL uses instream salmonid habitat parameters with desired conditions to reflect net long term effects of sediment loading and transport.

6.3.7.4 Temperature

A. Scott River Temperature Source Analysis

The temperature source analysis identifies the various water heating and cooling processes and sources of elevated water temperatures in the Scott River Watershed. Anthropogenic processes that influence water temperature include changes to: stream shade, stream flow via changes in groundwater accretion, stream flow via surface water use, microclimate, and channel geometry.

The primary factor affecting stream temperatures in the Scott River Watershed is

increased solar radiation resulting from reductions of shade provided by near-stream vegetation. Changes in groundwater accretion also impact water temperatures in Scott Valley. Diversions of surface water lead to relatively small temperature impacts in the mainstem Scott River, but have the potential to affect temperatures in smaller tributaries where the volume of water diverted is relatively large compared to the total stream flow. Microclimate alterations resulting from near-stream vegetation removal increase temperatures, where microclimates exist. Changes in channel geometry from natural conditions also negatively affect water temperatures.

B. Scott River Temperature TMDL

The temperature TMDL is focused on effective shade and adjusted potential effective shade (see the Glossary for definitions). The temperature TMDL for the Scott River Watershed is the adjusted potential effective shade conditions for the date of the summer solstice as expressed graphically in Figure 6-3 and numerically in Table 6-19 that can occur along a waterbody without causing non-attainment of applicable water quality standards.

Figure 6-3 shows the percent of stream length in the watershed that is shadier than a given shade value. For example, approximately 30% of the stream length has an effective shade index value of 5.00 or more under current conditions, whereas approximately 74% of the stream length would have an effective shade index value of 5.00 or more under adjusted potential shade conditions. An effective shade index value of 5.00 is equivalent to 50% effective shade.

As more information becomes available, the temperature TMDL may require revision.

C. Scott River Temperature Load Allocations

The Scott River temperature load allocations are adjusted potential effective shade conditions as expressed in Figure 6-4.

D. Scott River Temperature Margin of Safety

The TMDL includes an implicit margin of safety, based on conservative assumptions, to account for uncertainties in the analysis. The conservative assumptions include not accounting for improvements in stream temperatures that are likely to result from reductions in sediment inputs and increases in large woody debris. The resulting water temperature improvements were not accounted for in the analysis and provide a margin of safety.

E. Scott River Temperature Seasonal Variations & Critical Conditions

To account for annual and seasonal variability, the analysis evaluated temperatures and thermal processes during the most critical time period for the most sensitive beneficial use (i.e., the hottest time of the year).

6.3.7.5 Implementation

Table 6-20 describes the specific implementation actions that shall be taken to achieve the TMDLs and meet the sediment and temperature-related water quality standards in the Scott River Watershed. Table 6-20 is organized by topic or source and by responsible party. Individual landowners and responsible parties may find that more than one implementation action is applicable to their unique circumstances.

The implementation actions are designed to encourage and build upon on-going, proactive restoration and enhancement efforts in the watershed. Additionally, the implementation actions described in Table 6-20 are necessary to fulfill obligations of the NPS Policy⁸⁷ and the Sediment TMDL Implementation Policy.⁸⁸

Although the North Coast Water Board prefers to pursue the implementation actions described in Table 6-20, the North Coast Water Board shall take appropriate permitting and/or enforcement actions should any of the implementation actions fail to be implemented by the responsible party or should the implementation actions prove to be inadequate. Various permitting and enforcement actions are described in the permitting and enforcement tools section on pages 4-36.00 through 4-37.00.

6.3.7.6 Monitoring

Monitoring shall be conducted upon the request of the North Coast Water Board's Executive Officer in conjunction with existing and/or proposed human activities that will result or likely result in sediment waste discharges and/or elevated water temperatures within the Scott River Watershed. Monitoring shall involve one or more of the following: implementation monitoring, upslope effectiveness monitoring, instream effectiveness monitoring, and compliance and trend monitoring. See the Glossary for definitions of these terms.

In order to determine the effectiveness of the Scott River TMDL Action Plan, North Coast Water Board staff shall develop a compliance and trend monitoring plan. The plan should include a description of monitoring objectives, parameters to monitor, procedures and techniques, locations of monitoring stations, frequency and duration, quality control and quality assurance protocols, data management procedures, data and analysis distribution procedures, benchmark conditions where available, measurable milestones, and specific due dates for monitoring and data analysis. North Coast Water Board staff shall complete the monitoring plan by September 8, 2007.

Monitoring requirements, primarily implementation monitoring and upslope effectiveness monitoring, are specifically incorporated into the proposed Memoranda of Understanding with the County of Siskiyou, the USFS, and the BLM. Additionally, implementation and upslope effectiveness monitoring will likely be required of those landowners/dischargers required to develop and implement an Erosion Control Plan and/or a Grazing and Riparian Management Plan, as necessary and appropriate on a case-by-case basis.

6.3.7.7 Reassessment and Adaptive Management

⁸⁷ The Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy).

⁸⁸ The Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Waters in the North Coast Region (Sediment TMDL Implementation Policy).

The North Coast Water Board will review, reassess, and possibly revise the Scott River TMDL Action Plan. Reassessment is likely to occur every three years during the Basin Planning Triennial Review process. North Coast Water Board staff will report to the North Coast Water Board at least yearly on the status and progress of implementation activities, and on whether current efforts are reasonably calculated and on track to achieve water quality standards within forty years. For activities that rely on encouragement as a first step, a formal assessment of effectiveness of these efforts will be completed by September 8, 2011. A more extensive reassessment will occur after September 8, 2016, the date that is ten years after the TMDL Action Plan took effect, or sooner, if the North Coast Water Board determines it necessary. During reassessment, the North Coast Water Board is likely to consider how effective the requirements of the TMDL Action Plan are at meeting the TMDLs, achieving sediment and temperature water quality objectives, and protecting the beneficial uses of water in the Scott River Watershed.

6.3.7.8 Enforcement

The North Coast Water Board shall take enforcement actions for violations of the Scott River TMDL Action Plan where elements of the TMDL Action Plan are made enforceable restrictions in a specific permit or order, as appropriate. Nothing in this TMDL Action Plan precludes actions to enforce any directly applicable prohibition found elsewhere in the Basin Plan or to require cleanup and abatement of existing sources of pollution where appropriate.

Table 6-16: Scott River Sediment Source Analysis Results in tons/sq. mi.-yr⁸⁹

Subwatershed ⁹⁰	Natural Sources					Anthropogenic Sources					Total Volume of Sediment Sources
	Landslides ⁹¹	Large Discrete Streamside Features ⁹²	Small Discrete Streamside Features ⁹³	Streamside Soil Creep	Unique Landslide Features	Landslides ⁹⁴	Large Discrete Streamside Features ⁴	Small Discrete Streamside Features ⁵	Road Related Sources ⁹⁵	Unique Landslide Features	
West Canyon	111	104	295	33	0	132	84	166	105	0	1031
East Canyon	0	87	387	37	0	1	31	180	31	0	754
Eastside	0	88	367	36	0	0	39	168	10	0	709
East Headwaters	0	108	236	33	0	1	124	175	13	0	691
West Headwaters	8	149	276	29	140	35	105	166	29	9	945
Westside	45	117	330	31	0	12	52	176	29	0	786
Scott Valley	0	0	226	13	0	0	0	287	6	0	533
Scott River Watershed	23	85	302	29	8	21	55	195	29	0	747

⁸⁹ Minor addition errors caused by rounding differences.

⁹⁰ Each subwatershed is delineated in Figure 6-2.

⁹¹ Includes landslides visible on air photos generally greater than one acre in size.

⁹² Large Discrete Features: Generally long-term continuing sources of sediment that typically originate on, or extend up onto, the mountainside based on on-site streamside surveys.

⁹³ Small Discrete Features: Streambank failures, gullies, and other small failures that mostly deliver episodically to a waterbody based on on-site streamside surveys.

⁹⁴ Includes landslides visible on air photos generally greater than one acre in size. Excludes road-related landslides.

⁹⁵ Includes road-related stream crossing failures, gullies, fill failures, and landslides based on road inventories. Includes road-related surface erosion and cut bank failures based on modeling.

Table 6-17: Scott River Sediment Load Allocations⁹⁶

Sediment Source		Current Load (tons/sq. mi. - yr)		Reduction Needed	Load Allocations (tons/sq. mi. - yr)	
Natural	Landslides ⁹⁷	23	448	0%	23	448
	Large Discrete Streamside Features	93		0%	93	
	Small Discrete Streamside Features	302		0%	302	
	Streamside Soil Creep	29		0%	29	
Anthropogenic	Road Surface Erosion	4	299	54%	2	112
	Road-Related Stream Crossing Failures	3		71%	1	
	Road-Related Gullies	1		31%	1	
	Road-Related Cut/Fill Failures	4		76%	1	
	Road-Related Landslides ²⁷	16		56%	7	
	Landslides, Timber Harvest Related	19		52%	9	
	Landslides, Mining Related ²⁷	2		0%	2	
	Large Discrete Streamside Features ⁹⁸	55		69%	17	
	Small Discrete Streamside Features, Harvest Related	54		63%	20	
	Small Discrete Streamside Features, Mining Related	2		0%	2	
	Small Discrete Streamside Features, Other ³	139		64%	50	
Totals		747		63%	560	

⁹⁶ Minor addition errors caused by rounding differences

⁹⁷ Includes both "Landslides" and "Unique Landslide Features" from Table 6-17.

⁹⁸ Sources influenced or caused by multiple interacting human activities not inventoried by other methods.

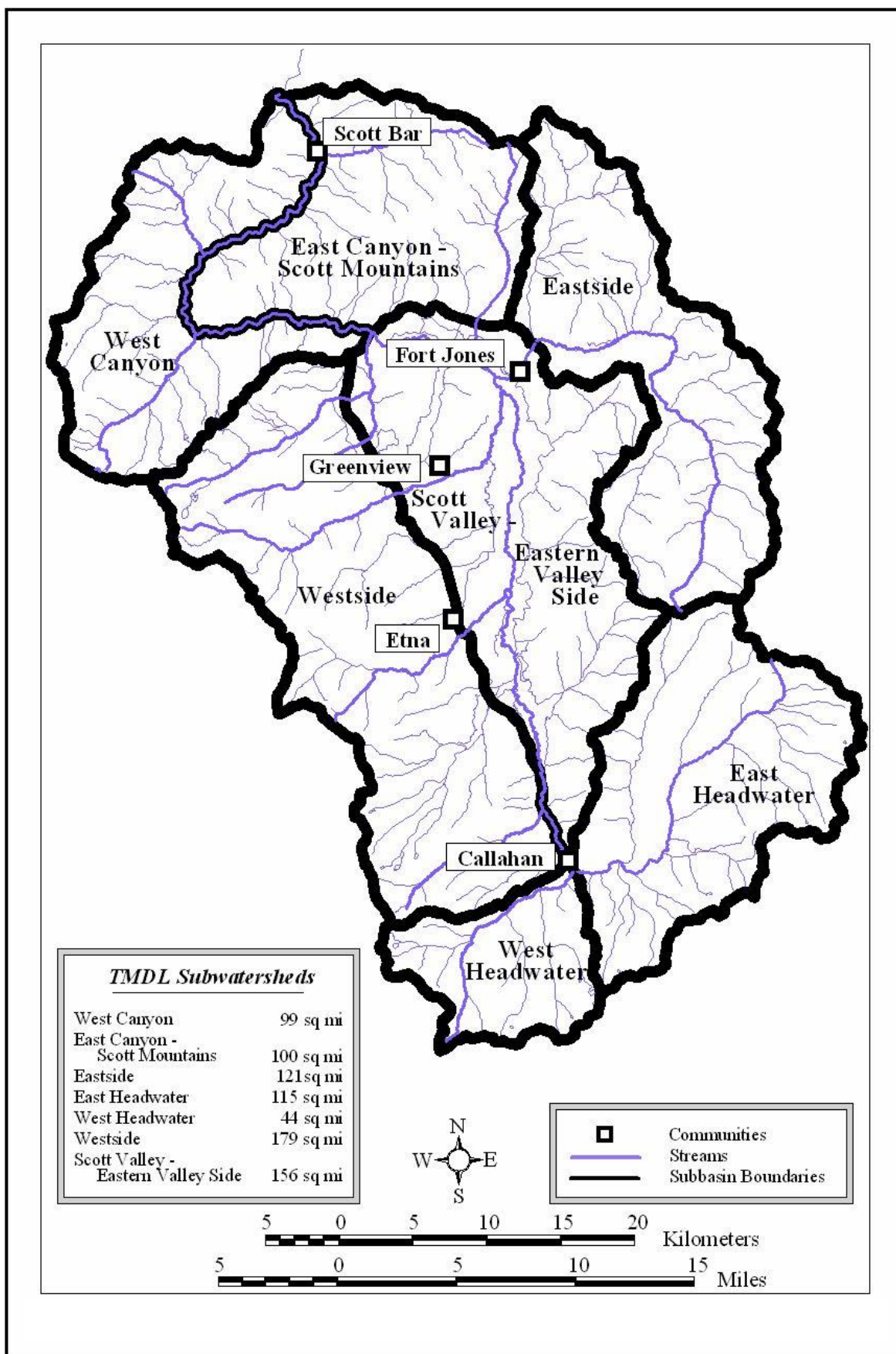


Figure 6-2: Subwatersheds in the Scott River Watershed
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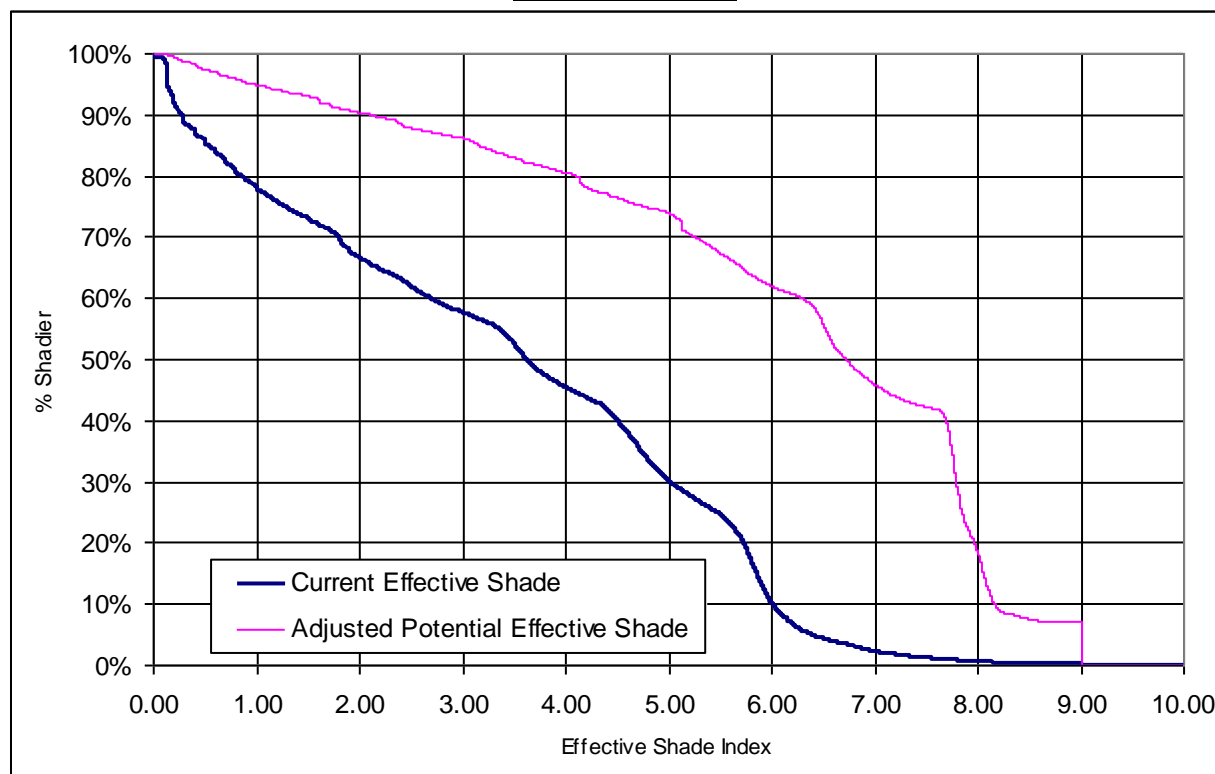
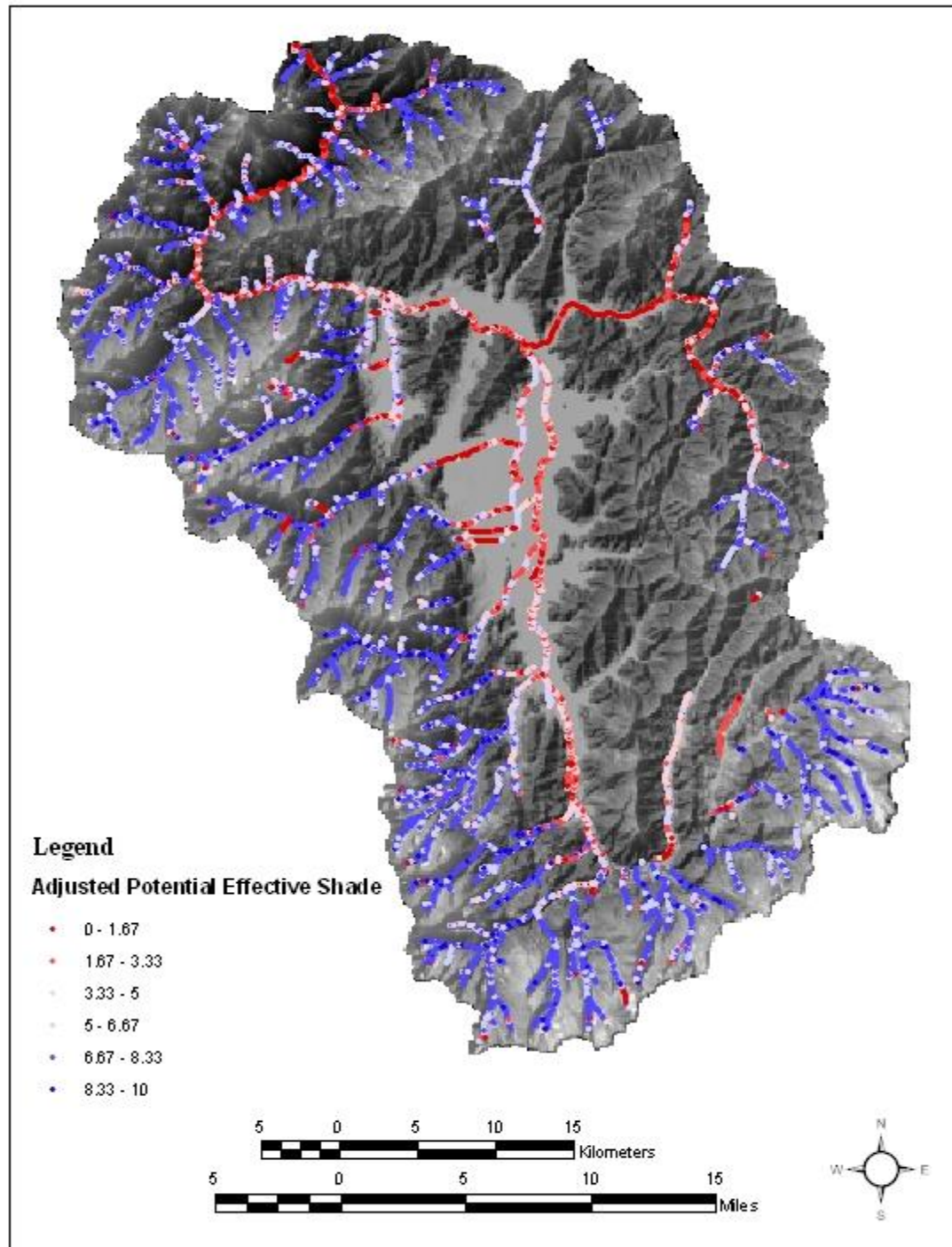


Figure 6-3: SCOTT RIVER TEMPERATURE TMDL EXPRESSED GRAPHICALLY - “% Shadier” refers to the percentage of stream length with more shade than the corresponding effective shade index.

Table 6-18: Scott River Temperature TMDL Expressed Numerically

Shade Class	Stream Length - Current Vegetation Conditions				Stream Length - Potential Vegetation Conditions			
	(miles)	(km)	% Shadier ⁹⁹	% of Total	(miles)	(km)	% Shadier	% of Total
(%)								
0-1	141	227	77.9%	22.1%	33	53	94.8%	22.1%
>1-2	73	117	66.6%	11.3%	29	46	90.3%	4.5%
>2-3	57	91	57.7%	8.8%	26	43	86.2%	4.1%
>3-4	78	126	45.4%	12.3%	26	58	80.5%	5.7%
>4-5	97	157	30.2%	15.2%	43	69	73.9%	6.7%
>5-6	127	204	10.3%	19.9%	76	122	62.0%	11.9%
>6-7	52	83	2.3%	8.1%	103	165	45.9%	16.0%
>7-8	10	17	0.6%	1.6%	177	284	18.3%	27.6%
>8-9	3	5	0.2%	0.5%	116	186	0.2%	18.1%
>9-10	1	2	0.0%	0.2%	1	2	0.0%	0.2%

⁹⁹ % Shadier refers to the percentage of stream length shadier than the upper bound of the corresponding shade class



Total:	639	1028	639	1028
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Figure 6-4: Scott River Temperature Load Allocations - Adjusted Potential Effective Shade.

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**Table 6-19: Scott River Sediment and Temperature TMDL Implementation
Actions¹⁰⁰**

Topic	Responsible Parties	Actions
Roads & Sediment Waste Discharges	<ul style="list-style-type: none"> Parties Responsible for Roads and Sediment Waste Discharge Sites North Coast Water Board 	<ul style="list-style-type: none"> The North Coast Water Board encourages parties responsible for roads and sediment waste discharge sites to take actions necessary to prevent, minimize, and control road-caused sediment waste discharges. Such actions may include the inventory, prioritization, control, monitoring, and adaptive management of sediment waste discharge sites and proper road inspection and maintenance. The North Coast Water Board's Executive Officer shall require parties responsible for roads, on an as-needed, site-specific basis, to develop and submit an Erosion Control Plan and a Monitoring Plan. An Erosion Control Plan shall describe, in detail, sediment waste discharge sites and how and when those sites are to be controlled. By September 8, 2008, criteria shall be developed for determining when an Erosion Control Plan shall be required, although nothing precludes the Executive Officer from requiring Erosion Control Plans prior to this date. Should discharges or threatened discharges of sediment waste that could negatively affect the quality of waters of the State be identified in an Erosion Control Plan or by other means, dischargers shall be required to implement their Erosion Control Plan and monitor sediment waste discharge sites through appropriate permitting or enforcement actions.
Roads	<ul style="list-style-type: none"> California Department of Transportation (Caltrans) 	North Coast Water Board staff shall evaluate the effects of Caltrans' statewide NPDES permit, stormwater permit, and waste discharge requirements (collectively known as the Caltrans Stormwater Program) by September 8, 2008. The evaluation shall determine the adequacy and

¹⁰⁰ Although the North Coast Water Board prefers to pursue the implementation actions listed in Table 6-20 the North Coast Water Board shall take appropriate permitting and/or enforcement actions should any of the implementation actions fail to be implemented by the responsible party or should the implementation actions prove to be inadequate.

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Topic	Responsible Parties	Actions
	<ul style="list-style-type: none"> North Coast Water Board 	effectiveness of the Caltrans Stormwater Program in preventing, reducing, and controlling sediment waste discharges and elevated water temperatures in the North Coast Region, including the Scott River Watershed. If North Coast Water Board staff find that the Caltrans Stormwater Program is not adequate and effective, North Coast Water Board staff shall develop specific requirements, for State Water Board consideration, to be incorporated into the Caltrans Stormwater Program at the earliest opportunity, or the North Coast Water Board shall take other appropriate permitting or enforcement actions.
Roads	<ul style="list-style-type: none"> County of Siskiyou (County) North Coast Water Board 	<p>The North Coast Water Board and the County shall work together to draft and finalize a Memorandum of Understanding (MOU) to address county roads in the Scott River Watershed. The MOU shall be drafted and ready for consideration by the appropriate decision-making body(ies) of the County by September 8, 2008. The following items shall be addressed during MOU development:</p> <ol style="list-style-type: none"> 1. A date for the initiation and completion of an inventory of all sediment waste discharge sites caused by county roads within the Scott River Watershed, which can be done with assistance from the Five Counties Salmonid Conservation Program. 2. A date for the completion of a priority list of sediment waste discharge sites. 3. A date for the completion of a schedule for the repair and control of sediment waste discharge sites. 4. A date for the completion of a document describing the sediment control practices to be implemented by the County to repair and control sediment waste discharge sites, which can be done with assistance from the Five Counties Salmonid Conservation Program. 5. A description of the sediment control practices, maintenance practices, and other management measures to be implemented by the County to prevent future sediment waste discharges, which can be done with assistance from the Five Counties Salmonid Conservation Program. 6. A monitoring plan to ensure that the sediment control practices are implemented as proposed and effective at controlling discharges of sediment waste.

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Topic	Responsible Parties	Actions
		7. A commitment by the County to complete the inventory, develop the priority list, develop and implement the schedule, develop and implement sediment control practices, implement the monitoring plan, and conduct adaptive management.
Grading	<ul style="list-style-type: none"> County of Siskiyou (County) North Coast Water Board 	The North Coast Water Board encourages the County to develop a comprehensive ordinance addressing roads, land disturbance activities, and grading activities outside of subdivisions in the Scott River Watershed, or an equivalent County-enforceable mechanism, by September 8, 2008. The ordinance may be specific to the Scott River Watershed or countywide in scope.
Dredge Mining	<ul style="list-style-type: none"> North Coast Water Board 	North Coast Water Board staff shall review laws and regulations that address water quality effects of suction dredge mining and shall investigate the impact of suction dredge mining activities on sediment and temperature loads in the Scott River Watershed by September 8, 2009. If North Coast Water Board staff find that dredge mining activities are discharging deleterious sediment waste and/or resulting in elevated water temperatures, staff shall propose, for Board consideration, the regulation of such discharges through appropriate permitting or enforcement actions.
Temperature & Vegetation	<ul style="list-style-type: none"> Parties Responsible for Vegetation that Shades Water Bodies North Coast Water Board 	<ul style="list-style-type: none"> The North Coast Water Board encourages parties responsible for vegetation that provides shade to a waterbody in the Scott River Watershed to preserve and restore such vegetation. This may include planting riparian trees, minimizing the removal of vegetation that provides shade to a waterbody, and minimizing activities that might suppress the growth of new or existing vegetation (e.g., allowing cattle to eat and trample riparian vegetation). To address compliance with the Nonpoint Source Policy, the North Coast Water Board shall develop and take appropriate permitting and enforcement actions to address the human-caused removal and suppression of vegetation that provides shade to a waterbody in the Scott River Watershed. The North Coast Water Board's Executive Officer shall report to the North Coast Water Board on the status of the preparation and development of appropriate permitting and enforcement actions by September 8, 2009.

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Topic	Responsible Parties	Actions
Water Use	<ul style="list-style-type: none"> • Water Users • County of Siskiyou (County) • Stakeholders • North Coast Water Board 	<ul style="list-style-type: none"> • The North Coast Water Board encourages water users to develop and implement water conservation practices. • The North Coast Water Board requests the County, in cooperation with other appropriate stakeholders, to study the connection between groundwater and surface water, the impacts of groundwater use on surface flow and beneficial uses, and the impacts of groundwater levels on the health of riparian vegetation in the Scott River Watershed. The study should: (1) consider groundwater located both within and outside of the interconnected groundwater area delineated in the Scott River Adjudication,¹⁰¹ (2) the amount of water transpired by trees and other vegetation, and (3), if deleterious impacts to beneficial uses are found, identify potential solutions including mitigation measures and changes to management plans. • Should the County determine that it and its stakeholders are able to commit to conducting the above study, the County, in cooperation with other stakeholders, shall develop a study plan by September 8, 2007. The study plan shall include: (1) goals and objectives; (2) data collection methods; (3) general locations of data collection sites; (4) data analysis methods; (5) quality control and quality assurance protocols; (6) responsible parties; (7) timelines and due dates for data collection, data analysis, and reporting; (8) financial resources to be used; and (9) provisions for adaptive change to the study plan and to the study based on additional study data and results, as they are available.
Flood Control & Bank Stabilization	<ul style="list-style-type: none"> • Parties Responsible for Flood Control Structures or Dredge, Fill, and/or Bank Stabilization Activities 	<ul style="list-style-type: none"> • The North Coast Water Board encourages parties responsible for levees and other flood control structures to plant and restore stream banks on and around existing flood control structures. • The North Coast Water Board shall rely on existing authorities and regulatory tools, such as the 401 Water Quality Certification program, to ensure that flood control and bank stabilization activities in the Scott River Watershed are

¹⁰¹ Superior Court of Siskiyou County. 1980. Scott River Adjudication: Decree No. 30662

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Topic	Responsible Parties	Actions
	<ul style="list-style-type: none"> North Coast Water Board 	<p>conducted in a manner that minimizes the removal or suppression of vegetation that provides shade to a waterbody, prevents or minimizes sediment delivery, and minimizes changes in channel morphology that could increase water temperatures.</p>
Timber Harvest	<ul style="list-style-type: none"> Private & Public Parties Conducting Timber Harvest Activities Habitat Conservation Plan Holders North Coast Water Board 	<ul style="list-style-type: none"> The North Coast Water Board shall use appropriate permitting and enforcement tools to regulate discharges from timber harvest activities in the Scott River Watershed, including, but not limited to, cooperation with, and participation in, the California Department of Forestry and Fire Protection's timber harvest project approval process. The North Coast Water Board shall use, where applicable, general or specific waste discharge requirements and waivers of waste discharge requirements to regulate timber harvest activities on private and public lands in the Scott River Watershed. Timber harvest activities on private lands in the Scott River Watershed are not eligible for Categorical Waiver C included in the Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region (Order No. R1-2004-0016, as it may be amended or updated for time to time) simply through the adoption of this TMDL Action Plan. However, timber harvest activities on private lands in the Scott River Watershed may be eligible for Categorical Waivers A, B, D, E, and F, as appropriate. Where a Habitat Conservation Plan (HCP) is developed, North Coast Water Board staff shall work with the HCP holder to develop, for Board consideration, ownership-wide waste discharge requirements for activities covered by the HCP, with any additional restrictions necessary to protect water quality and beneficial uses. If current laws and regulation governing timber harvest (e.g., the Forest Practice Rules) are changed in a manner that reduces water quality protections, the North Coast Water Board will use its authorities to maintain at a minimum the current level of water quality protection.

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Topic	Responsible Parties	Actions
U.S. Forest Service U.S. Bureau of Land Management	<ul style="list-style-type: none"> U.S. Forest Service (USFS) U.S. Bureau of Land Management (BLM) North Coast Water Board 	<ul style="list-style-type: none"> The North Coast Water Board and federal land management agencies, including the USFS and the BLM, shall work together to draft and finalize Memoranda of Understanding (MOU) that shall address sediment waste discharges, elevated water temperatures, and grazing activities within the Scott River Watershed. The MOUs shall be drafted and ready for consideration by the appropriate decision-making body(ies) by September 8, 2008. The following items shall be addressed during MOU development: <p>Contents Related to Sediment Waste Discharges:</p> <ol style="list-style-type: none"> 1. A date for the completion of an inventory of all significant sediment waste discharge sites and all roads on USFS/BLM land. 2. A date for the completion of a priority list. 3. A date for the completion of a schedule for the repair and control of significant sediment waste discharge sites. 4. A date for the completion of a document describing the sediment control practices to be implemented by the USFS/BLM to repair and control sediment waste discharge sites. 5. A description of sediment control practices, road maintenance practices, and other management measures to be implemented by the USFS/BLM to prevent or minimize future sediment waste discharges. 6. A monitoring plan to ensure that sediment control practices are implemented as proposed and are effective at controlling discharges of sediment waste. 7. A commitment by the USFS/BLM to complete the inventory, develop the priority list, develop and implement the schedule, develop and implement sediment control practices, implement the monitoring plan, and conduct adaptive management.
U.S. Forest Service	<ul style="list-style-type: none"> U.S. Forest Service (USFS) 	<p>Contents Related to Elevated Water Temperatures:</p> <ol style="list-style-type: none"> 1. A commitment by the USFS/BLM to continue to implement the Riparian Reserve buffer width requirements.

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Topic	Responsible Parties	Actions
U.S. Bureau of Land Management	<ul style="list-style-type: none"> U.S. Bureau of Land Management (BLM) North Coast Water Board 	<ol style="list-style-type: none"> A monitoring plan to ensure that the Riparian Reserve buffer widths are effective at preventing or minimizing effects on natural shade. A commitment by the USFS/BLM to implement the Riparian Reserve monitoring plan and conduct adaptive management. <p>Contents Related to Grazing Activities:</p> <ol style="list-style-type: none"> A date for the completion of a description of grazing management practices and riparian monitoring activities implemented in grazing allotments on USFS/BLM lands. A commitment by the USFS/BLM and the North Coast Water Board to determine if existing grazing management practices and monitoring activities are adequate and effective at preventing, reducing, and controlling sediment waste discharges and elevated water temperatures. A commitment by the USFS/BLM to develop revised grazing management practices and monitoring activities, should existing measures be inadequate or ineffective, subject to the approval of the North Coast Water Board's Executive Officer. A commitment by the USFS/BLM to implement adequate and effective grazing management practices and monitoring activities and to conduct adaptive management.
Grazing	<ul style="list-style-type: none"> Private Parties Conducting Grazing Activities North Coast Water Board 	<ul style="list-style-type: none"> The North Coast Water Board encourages the parties responsible for grazing activities to take necessary actions to prevent, minimize, and control sediment waste discharges and elevated water temperatures. The North Coast Water Board's Executive Officer shall require parties responsible for grazing activities on private lands in the Scott River Watershed to develop, submit, and implement a Grazing and Riparian Management Plan and a Monitoring Plan on an as-needed, site-specific basis. A Grazing and Riparian Management Plan shall describe, in detail, (1) sediment waste discharges and sources of elevated water temperatures caused by livestock grazing, (2) how and when such sources are to be controlled and monitored, and (3) management practices

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Topic	Responsible Parties	Actions
		<p>that will prevent and reduce future sources. By September 8, 2008, criteria shall be developed for determining when a Grazing and Riparian Management Plan shall be required, although nothing precludes the Executive Officer from requiring Grazing and Riparian Management Plans prior to this date.</p> <ul style="list-style-type: none"> • Should human activities that will likely result in sediment waste discharges and/or elevated water temperatures be proposed or identified, through a Grazing and Riparian Management Plan or by other means, the responsible party(ies) shall be required to implement their Grazing and Riparian Management Plans and monitor through appropriate permitting or enforcement actions.
Siskiyou RCD Scott River Watershed Council	<ul style="list-style-type: none"> • Siskiyou Resource Conservation District (SRCD) • Scott River Watershed Council (SRWC) • North Coast Water Board 	<ul style="list-style-type: none"> • The North Coast Water Board and staff shall increase efforts to work cooperatively with the SRCD and SRWC to provide technical support and information to landowners and stakeholders in the Scott River Watershed and to coordinate educational and outreach efforts. • The North Coast Water Board shall encourage the SRWC to (1) implement the strategic actions specified in the Strategic Action Plan and (2) assist landowners in developing and implementing management practices that are adequate and effective at preventing, minimizing, and controlling sediment waste discharges and elevated water temperatures.
Natural Resources Conservation Service University of California Cooperative Extension	<ul style="list-style-type: none"> • Natural Resources Conservation Service (NRCS) • University of California Cooperative Extension (UCCE) • North Coast Water Board 	<ul style="list-style-type: none"> • The North Coast Water Board shall increase efforts to work cooperatively with the NRCS and UCCE to provide technical support and information to responsible parties and stakeholders in the Scott River Watershed and to coordinate educational and outreach efforts.
CA Dept. of Fish and Wildlife	<ul style="list-style-type: none"> • CA Dept of Fish and Wildlife (CDFW) 	<ul style="list-style-type: none"> • The Regional Water Board shall encourage the CDFW and aid, where appropriate, in the implementation of necessary tasks, actions, and recovery recommendations as specified in the Recovery Strategy for California Coho Salmon

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Topic	Responsible Parties	Actions
	<ul style="list-style-type: none"> Regional Water Board 	(CDFG/CDFW 2004) in the Scott River Watershed.

6.3.7.9 Glossary

Adjusted Potential Effective Shade:

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

Compliance and Trend Monitoring:

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

Effective Shade:

The percentage of direct beam solar radiation attenuated and scattered before reaching the ground or stream surface from topographic and vegetation conditions.

Groundwater Accretion:

The gradual increase in surface flow in a stream resulting from the influx of groundwater.

Implementation Monitoring:

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

Instream Effectiveness Monitoring:

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

Potential Vegetation Conditions:

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

Road:

Any vehicle pathway, including, but not limited to: paved roads, dirt roads, gravel roads, public roads and highways, private roads, rural residential roads and driveways, permanent roads, temporary roads, seasonal roads, inactive roads, trunk roads, spur roads, ranch roads, timber roads, skid trails, and landings which are located on or adjacent to a road.

Salmonids:

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

Sediment:

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

Sediment Waste:

Sediment that is generated directly or indirectly by anthropogenic activities or projects.

Sediment Waste Discharge Site:

An individual, anthropogenic erosion site that is currently discharging or has the potential to discharge sediment waste to waters of the state.

Thermal Refugia:

Colder areas within a water body that provide cold water refuge from unsuitably warm water.

Timber Harvest Activities:

Commercial and non-commercial activities relating to forest management and timberland conversions. These activities include the cutting or removal of both timber and other solid wood forest products, including Christmas trees. These activities include, but not limited to, construction, reconstruction and maintenance of roads, fuel breaks, firebreaks, watercourse crossings, landings, skid trails, or beds for the falling of trees; fire hazard abatement and fuel reduction activities; burned area rehabilitation; and site preparation that involves disturbance of soil or burning of vegetation following timber harvesting activities; but excluding preparatory tree marking, surveying, or road flagging.

Upslope Effectiveness Monitoring:

Monitoring intended to determine, by assessing upslope conditions, if sediment control practices are effective at keeping waste sediment from being discharged to a waterbody. This type of monitoring can be as simple as photographic documentation, provided that the photographs are adequate to represent and substantiate that the sediment control practices are effective.

6.3.8 Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads¹⁰²

The Shasta River Watershed (CalWater Hydrologic Area 105.50), which includes all tributaries and Lake Shastina, comprises approximately 508,734 acres (795 mi²) in Siskiyou County. The Shasta River is tributary to the Klamath River. This Action Plan for the Shasta River Temperature and Dissolved Oxygen Total Maximum Daily Loads, hereinafter known as the Shasta River TMDL Action Plan, includes temperature and dissolved oxygen total maximum daily loads (TMDLs) and describes the implementation

¹⁰² Adopted by the North Coast Regional Water Quality Control Board on June 29, 2006. Adopted by the State Water Resources Control Board on November 15, 2006. Approved by the State Office of Administrative Law on January 9, 2007. Approved by the United States Environmental Protection Agency on January 26, 2007.

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actions necessary to achieve the TMDLs and attain water quality standards in the Shasta River Watershed. The goal of the Shasta River TMDL Action Plan is to achieve the TMDLs, and thereby achieve dissolved oxygen and temperature related water quality standards, including the protection of the beneficial uses of water in the Shasta River Watershed.

The Shasta River TMDL Action Plan sets out the loads and conditions to be considered and incorporated into regulatory and non-regulatory actions in the Shasta River Watershed. The Shasta River TMDL Action Plan is not directly and independently enforceable, except as incorporated into appropriate permitting or enforcement orders.

A glossary defining key terms (**bolded first time used**) is located at Part IX of this Action Plan.

6.3.8.1 Problem Statement

The Shasta River Watershed was listed as impaired for organic enrichment/dissolved oxygen in 1992, and as impaired for temperature in 1994, pursuant to Section 303(d) of the Clean Water Act. These listings were confirmed in the TMDL analysis. Dissolved oxygen concentrations are regularly too low to comply with the Basin Plan dissolved oxygen objectives. Water temperature conditions regularly exceed temperature thresholds protective of **salmonids**.

Low dissolved oxygen concentrations and elevated water temperatures in the Shasta River, its tributaries, and Lake Shastina have resulted in degraded water quality conditions that do not meet applicable water quality objectives and that impair designated beneficial uses. The designated beneficial uses that are not fully supported include: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); and spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); and contact and non-contact water recreation (REC-1 and REC-2). The designated beneficial uses associated with the cold freshwater salmonid fishery (COMM, COLD, RARE, MIGR, SPWN) are the designated beneficial uses most sensitive to the dissolved oxygen and water temperature impairments. Important species in the Shasta River watershed include coho and Chinook salmon, trout, and lamprey. These, as well as green sturgeon, are also significant species in the Klamath River.

The Klamath River, to which the Shasta River is a major tributary, is also listed as impaired for low dissolved oxygen, high water temperature, and high nutrient levels. The Klamath River has additional beneficial uses that are not designated for the Shasta River that may be adversely affected by inputs from the Shasta River. These beneficial uses include the Native American cultural use (CUL) that supports cultural and traditional rights of indigenous people, such as ceremonial uses, and the subsistence fishing use (FISH).

6.3.8.2 Watershed Restoration Efforts

Throughout the Shasta River Watershed, many individuals, groups, and agencies have been working to enhance and restore fish habitat and water quality. These groups include, but are not limited to, the Shasta Valley Resource Conservation District, the Shasta River Coordinated Resources Management and Planning Committee, private timber companies, the Natural Resource Conservation Service, Siskiyou County and the Five Counties Salmonid Conservation Program, the California Department of Fish and Wildlife,

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the California Department of Water Resources, the United States Forest Service, and the Klamath River Basin Fisheries Task Force. The past and present efforts of these stakeholders have improved water quality conditions in the Shasta River and its tributaries.

6.3.8.3 Temperature

A. Shasta River Temperature Source Analysis

The Shasta River temperature source analysis identifies the sources (or factors) that affect the temperature of the Shasta River Watershed. Five primary factors have been identified as affecting stream temperatures in the Shasta River Watershed. Human activities have affected, or have a potential to affect, each of these factors. The factors include:

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

In addition, microclimate alterations resulting from near-stream vegetation removal may increase temperatures, where microclimates exist. Changes in channel geometry from natural conditions can also negatively affect water temperatures. These factors have not been quantified for the Shasta River temperature TMDL.

B. Shasta River Temperature TMDL

The “loading capacity” refers to the total loading of a pollutant that a waterbody can assimilate and still meet water quality objectives and protect beneficial uses. For the temperature TMDL the water quality objective of concern is the temperature objective, which prohibits the alteration of the natural receiving water temperature unless such alteration does not adversely affect beneficial uses. The loading capacity provides a reference for calculating the amount of pollutant load reduction needed to bring a waterbody into compliance with standards. The starting point for the load allocation analysis is the equation that describes the Total Maximum Daily Load or loading capacity:

$$\text{TMDL} = \text{Loading Capacity} = \Sigma \text{WLAs} + \Sigma \text{LAs} + \text{Natural Background}$$

where Σ = the sum, WLAs = waste load allocations, and LAs = load allocations. Waste load allocations are contributions of a pollutant from point sources, while load allocations are contributions from management-related nonpoint sources. There are no point source heat loads in the Shasta River Watershed, and therefore no waste load allocations apply.

The Shasta River Watershed temperature TMDL loading capacity is equal to the **potential percent solar radiation transmittance** for the mainstem Shasta River below Dwinnell Dam, **adjusted potential effective shade** for the Shasta River above Dwinnell Dam and on tributaries, no net increase in receiving water temperature from tailwater return flows, and a flow regime that results in reductions in maximum daily temperature of 1.5°C, 1.2°C, and 2.1°C for compliance points at river miles (RM) 24.1, 15.5, and 5.6, respectively.

The TMDL equation is:

TMDL = Loading Capacity =

- Potential Percent Solar Radiation Transmittance of the Shasta River
- + Adjusted Potential Effective Shade of the Tributaries
- + No Net Increase in Temperature from Tailwater Return Flows
- + Flow Increases that Achieved Specific Temperature Reductions at Compliance Locations.

C. Shasta River Temperature Load Allocations

In accordance with the Clean Water Act, the Shasta River temperature TMDL is allocated to sources of elevated water temperature in the watershed. As there are no known point source heat loads to the Shasta River, the TMDL is allocated among the nonpoint source heat loads in the watershed. The nonpoint sources include (1) solar heat load (i.e., sunlight) at streamside (riparian) locations in the watershed, (2) heat load from tailwater return flows, and (3) reduced assimilative capacity from surface water flow reductions.

In order to quantify the part of the TMDL focused on solar heat loads that arise from changes in streamside vegetation, and to be able to compare it to current conditions, two surrogate measures are used: (1) potential percent solar radiation transmittance at locations along the mainstem Shasta River below Dwinnell Dam, and (2) adjusted potential effective shade at locations upstream of Dwinnell Dam and along tributary streams (see Glossary). Landowners and operators in the mainstem Shasta River below Dwinnell Dam are allocated loads equal to potential percent solar radiation transmittance, as tabulated in Table 6-21 and depicted in Figure 6-5. Landowners and operators on the Shasta River above Dwinnell Dam and on tributaries are allocated loads equal to adjusted potential effective shade, which is equal to 90% of site potential shade, to allow for natural riparian disturbances such as floods, wind throw, disease, landslides, and fire. The load allocation for tailwater return flow sources within the Shasta River Watershed is a zero net increase in receiving water temperature.

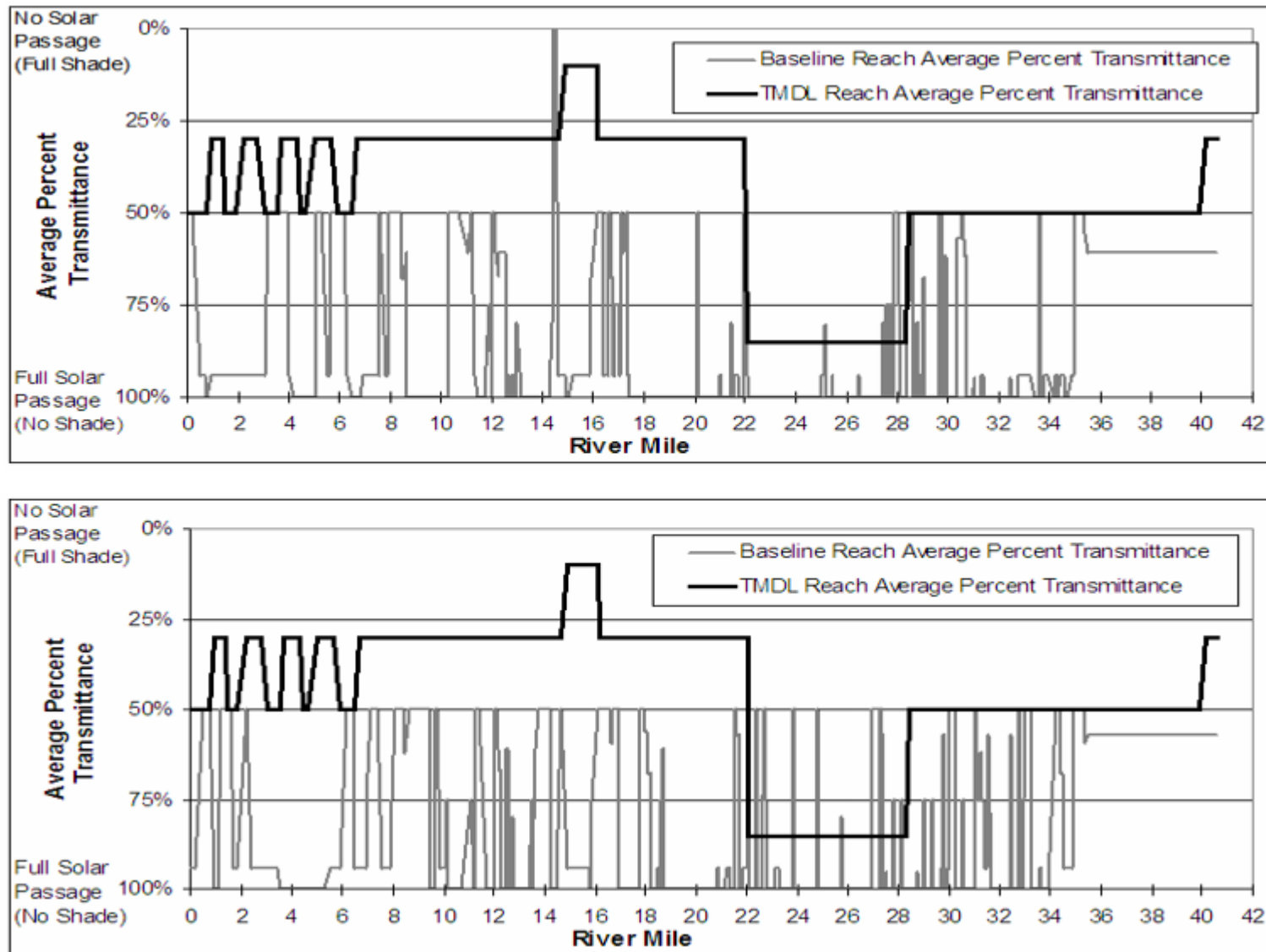


Figure 6-5: EXISTING (BASELINE) AND BOTENTIAL SOLAR RADIATION TRANSMITTANCE FOR THE LEFT BANK (A) AND RIGHT BANK (B) OF THE SHASTA RIVER

**Table 6-20: Solar Heat Load Allocations for the Mainstem Shasta River,
Expressed as the potential percent solar radiation transmittance by river
reach.**

River Reach	Upstream River Mile	Downstream River Mile	Potential Average Reach Percent Transmittance ¹⁰³
Dwinnell Dam to Riverside Road	40.6	39.9	30
Riverside Road to u/s of A12	39.9	28.3	50
U/S of A12 to DeSoza Lane	28.3	22.0	85
Near DeSoza Lane to u/s of Montague-Grenada Road	22.0	16.1	30
Near Montague-Grenada Road	16.1	14.6	10
D/S Montague-Grenada Road to Hwy 263	16.4	7.3	30
Hwy 263 to mouth	7.3	0	30 to 50 ¹⁰⁴

Table 6-21: Shasta River Watershed Temperature Load Allocations

Source	Allocation
Change in Riparian Vegetation	Shasta River below Dwinnell Dam: Reach average potential solar radiation transmittance, as presented in table 6-21 and Figure 6-5. Shasta River above Dwinnell Dam and Tributaries: Adjusted potential effective shade = 90% of site potential effective shade.
Irrigation Return Flow	No net increase in receiving water temperature.
Surface Water Flow	Reductions in the maximum daily stream temperatures of 1.5°C, 1.2°C, and 2.1°C from baseline at RM 24.1, RM 15.5, and RM 5.6.

The load allocation for surface water flow is a reduction in the maximum daily stream temperatures of 1.5°C, 1.2°C, and 2.1°C from baseline at RM 24.1, RM 15.5, and RM 5.6, respectively. These are the temperature compliance locations for the TMDL.

Table 6-22 summarizes the temperature load allocations for the Shasta River Watershed.

¹⁰³ Daylight-hour average percent transmittance for given reach.

¹⁰⁴ Alternates between 30% and 50%

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

The temperature TMDL includes an implicit margin of safety, based on conservative assumptions and uncertainties. The **water quality compliance model scenario** incorporated temperature reductions from Big Springs Creek and Parks Creek to account for improvements associated with riparian shade and tailwater management, but did not incorporate temperature reductions from Yreka Creek and other small tributaries to the Shasta River, and provides a margin of safety. Topographic shade was not considered in the temperature model and is likely a factor in the Shasta canyon, and provides a margin of safety. Some improvements in stream temperature that may result from reduced **sediment** inputs are not quantified. Reduced sediment loads could lead to increased frequency and depth of pools, independent of changes in solar radiation input. These changes tend to result in lower stream temperatures overall and increase the amount of lower temperature pool habitat. These expected changes are not directly accounted for in the TMDL. Finally, the effects of changes to streamside riparian areas toward mature trees will tend to create microclimates that will lead to improvements in stream temperatures. These effects were not accounted for in the temperature analysis and provide a margin of safety.

To account for annual and seasonal variability, the Shasta River temperature TMDL analysis evaluated temperatures and thermal processes from late-spring through mid-fall, considered the most critical time period for the most sensitive beneficial uses. The critical period, defined as May 15 to October 15, accounts for seasonal variation and provides an implicit margin of safety because during this period the air temperature is above average, the flow is below average, and the most sensitive beneficial uses – SPWN and COLD – are present. Sensitive life stages exist in Shasta River Watershed throughout the year, but summer water temperatures represent the most critical conditions with respect to temperature and the most sensitive beneficial uses.

6.3.8.4 Dissolved Oxygen

A. Shasta River Dissolved Oxygen Source Analysis

Dissolved oxygen levels in surface waters are controlled by a number of interacting processes including: photosynthesis, respiration, **carbonaceous deoxygenation**, **nitrogenous deoxygenation** and nitrification, reaeration, **sediment oxygen demand (SOD)**, water temperature, salinity, flow, and atmospheric pressure. The primary processes affecting dissolved oxygen concentrations in the Shasta River Watershed are photosynthesis and respiration of aquatic plants, nitrogenous deoxygenation (termed **nitrogenous biochemical oxygen demand** or NBOD), and sediment oxygen demand. The following anthropogenic sources or factors, in no special order, adversely affect dissolved oxygen conditions in the Shasta River:

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

B. Shasta River Dissolved Oxygen TMDL

The dissolved oxygen “loading capacity” of the Shasta River is the total net daily oxygen demand that results in attainment of the dissolved oxygen objectives. For the dissolved oxygen TMDL the water quality objective of concern is the minimum dissolved oxygen objective of 7.0 mg/L for the Shasta River. There are no known point sources of oxygen-demanding constituents to the Shasta River and tributaries. Each of the components that exert an oxygen demand on the Shasta River is attributed to nonpoint sources, and includes respiration of aquatic plants, SOD, and NBOD.

The dissolved oxygen loading capacity of the Shasta River is 12,353 pounds of oxygen demand per day, and is expressed as the following Shasta River dissolved oxygen TMDL equation:

$$\text{TMDL} = \text{Loading Capacity} = 12,353 \text{ lbs O}_2/\text{day}$$

C. Shasta River Dissolved Oxygen Load Allocations

In accordance with the Clean Water Act, the Shasta River dissolved oxygen TMDL is allocated to the sources of oxygen demand in the watershed. There are no known point sources of oxygen-demanding constituents in the Shasta River Watershed, and therefore the waste load allocation is set to zero. Therefore, the TMDL includes oxygen demand from natural and nonpoint anthropogenic sources. The load allocations are assigned to reaches of the Shasta River as identified in Table 6-23 and 6-24 and account for the total net daily oxygen demand for the designated river reaches. Responsibility for meeting these river reach allocations is assigned to the landowners whose operations contribute to water quality conditions within the specified reaches. In addition to these river-reach load allocations, allocations are applied to several river inputs that require NBOD reductions in order to achieve water quality compliance, including Dwinnell Dam outflow, Yreka Creek, and tailwater return flow. These allocations are assigned as NBOD concentrations of 0.91 mg/L for both Dwinnell Dam outflow and Yreka Creek, and 0.85 mg/L for all tailwater return flow.

Meeting the dissolved oxygen TMDL and load allocations requires:

- Fifty percent reduction in respiration rates of instream aquatic plants;
- Fifty percent reduction in SOD rates behind minor impoundments;
- Reduced NBOD input concentrations; and
- Increased dedicated cold water instream surface water flow.

D. Shasta River Dissolved Oxygen Margin of Safety, Seasonal Variations, and Critical Conditions

The TMDL includes an implicit margin of safety to account for uncertainties in the analysis and because conservative assumptions are used in the TMDL analysis. The water quality compliance model scenario, which is the basis for the dissolved oxygen TMDL, includes a 50% reduction of sediment oxygen demand only at locations behind minor impoundments in the Shasta River. Fine sediment and organic material load reductions from tailwater

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return flows that can be achieved via controls targeting NBOD reductions would result in reductions in sediment oxygen demand in the entire river, not

Table 6-22: Shasta River TMDL River Reach Load Allocations and Total Oxygen Demand Reductions Needed for Water Quality Compliance (Hourly)

Reach	Reach Length (mi)	Hourly Demand Existing (Baseline) Conditions (lbs/hr)	Hourly Demand Water Compliance Conditions (lbs/hr)	Reduction In Oxygen Demand Needed To Achieve Water Compliance (lbs/hr)	Reduction In Oxygen Demand Needed To Achieve Water Compliance (%)
Dwinnell Reservoir – Riverside Drive	0.7	12	8	4	30%
Riverside Drive – Parks Creek	5.0	72	40	32	44%
Parks Creek – Big Springs Creek	1.3	33	21	13	38%
Big Springs Creek – Highway A-12	9.6	331	217	114	35%
Highway A-12 – Shasta River at Freeman Lance	5.0	147	93	54	37%
Shasta River at Freeman Lance – DWR Weir	3.6	73	39	33	46%
DWR Weir – Yreka-Ager Road	4.4	62	31	31	50%
Yreka-Ager Road – Anderson Grade Road	3.1	52	27	26	49%
Anderson Grade Road - Mouth	8.1	77	39	38	49%

Table 6-23: Shasta River TMDL River Reach Load Allocations and Total Oxygen Demand Reductions Needed for Water Quality Compliance (Daily)

Reach	Reach Length (mi)	24 Hour Demand Existing (Baseline) Conditions (lbs/day)	24 Hour Demand Water Quality Compliance Conditions (lbs/day)	Reduction In Oxygen Demand Needed To Achieve Water Quality Compliance (lbs/day)	Reduction In Oxygen Demand Needed To Achieve Water Quality Compliance (%)
Dwinnell Reservoir – Riverside Drive	0.7	285	198	87	30%
Riverside Drive – Parks Creek	5.0	1,722	957	765	44%
Parks Creek – Big Springs Creek	1.3	797	494	304	38%
Big Springs Creek – Highway A-12	9.6	7,937	5,197	2,741	35%
Highway A-12 – Shasta River at Freeman Lance	5.0	3,529	2,226	1,303	37%
Shasta River at Freeman Lance – DWR Weir	3.6	1,749	947	803	46%
DWR Weir – Yreka-Ager Road	4.4	1,492	749	743	50%
Yreka-Ager Road – Anderson Grade Road	3.1	1,253	637	616	49%
Anderson Grade Road - Mouth	8.1	1,857	948	909	49%

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just behind impoundments. This represents a margin of safety. In addition, the water quality compliance model scenario does not include **biochemical oxygen demand** (CBOD) concentration reductions. Controls targeting NBOD reductions from tailwater return flows, Dwinnell Dam outflow, and Yreka Creek would result in reductions in CBOD concentrations, and provide a margin of safety.

The dissolved oxygen analysis was conducted for the period from late-spring through mid-fall. This critical period, defined as May 15 to October 15, accounts for seasonal variation and provides an implicit margin of safety because during this period the air temperature is above average, the flow is below average, and the most sensitive beneficial uses – SPWN and COLD – are present. Sensitive life stages exist in the Shasta River Watershed throughout the year, but summer conditions represent the most critical conditions with respect to dissolved oxygen. This critical period also corresponds to the time of greatest photoperiod and highest water temperature, both of which contribute to low dissolved oxygen concentrations. To account for the possibility that excursions below the TMDL may occur during periods of time other than the critical period, the TMDL is established as a year-round load.

6.3.8.5 Implementation

Specific implementation actions that the North Coast Water Board and other responsible parties shall pursue to achieve the TMDLs and meet the dissolved oxygen and temperature related water quality standards in the Shasta River and tributaries are described in Table 6-25. Table 6-25 is organized by source or land use activity, and responsible party(ies) considered appropriate to implement TMDL actions. Responsible parties may find that more than one implementation action is applicable to their circumstances. Action items are fully independent from each other and require 100% implementation within each Source or Land Use category. The implementation actions are designed to encourage and build upon ongoing, proactive restoration and enhancement efforts in the watershed. Additionally, the implementation actions described in Table 6-13 are necessary to comply with California's Nonpoint Source Pollution Control Program (NPS Policy), and include the five required key elements as described in the NPS Policy.

The North Coast Water Board hereby waives the requirement to file a Report of Waste Discharge (RWD) and obtain Waste Discharge Requirements (WDR), pursuant to Water Code section 13269, for discharges addressed by this Action Plan for dischargers that choose to participate in the ongoing collaborative programs and implement recommended measures as applicable, as described in Table 6-25. Should a discharger choose not to participate, or if the North Coast Water Board's Executive Officer determines additional measures are necessary and provides the discharger with written notice to that effect, the discharger must submit a Report of Waste Discharge (RWD) and filing fee to the North Coast Water Board immediately or in accordance with the written notice.

If the implementation actions identified in Table 6-25 fail to be implemented by the responsible party or if the implementation actions prove to be inadequate the North Coast Water Board shall take additional permitting and/or enforcement actions, as necessary. The State and Regional Water Boards shall require compliance with the conditions pursuant to which the waiver is granted. This conditional waiver shall not apply to any

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discharges for which a WDR, waiver, or prohibition is issued under a separate action of the Board. This conditional waiver expires upon North Coast Water Board adoption of a superseding regulatory action after the evaluation period specified below for each source category, or after five years, whichever occurs first. This waiver is conditional and may be terminated at any time by the State or Regional Water Board.

6.3.8.6 Enforcement

The North Coast Water Board shall take enforcement actions for violations of the Shasta River TMDL Action Plan where elements of the TMDL Action Plan are made enforceable restrictions in a specific permit or order, as appropriate. If necessary, North Coast Water Board staff may propose appropriate enforcement actions for human activities that result in discharges, including but not limited to the removal or suppression of vegetation that provides shade to a water body in the Shasta River Watershed. Enforcement implementation is ongoing. Nothing in this TMDL Action Plan precludes actions to enforce any directly applicable prohibition or provisions found elsewhere in the Basin Plan or to require clean up and abatement of existing sources of pollution where appropriate.

6.3.8.7 Monitoring

Monitoring is important for determining the success of the TMDL Action Plan in achieving dissolved oxygen and temperature water quality standards. Monitoring shall be conducted upon the request of the North Coast Water Board's Executive Officer in conjunction with existing and/or proposed human activities that will likely result in increased dissolved oxygen and reduced water temperatures in the Shasta River Watershed. Monitoring may involve implementation, upslope effectiveness, photo documentation, instream and near-stream effectiveness (e.g. riparian buffer establishment affecting nutrient discharges), and/or **compliance and trend monitoring** (e.g. temperature and dissolved oxygen, Potential Percent Solar Radiation Transmittance, time predicated dissolved oxygen sampling, nutrients, sediment oxygen demand, nitrates and nitrites, and any other parameters reflective of improvements toward achieving the TMDL). Monitoring parameters and frequency, numeric and narrative objectives, and other appropriate metrics shall be based on locations consistent with those reaches representative of the TMDL.

The North Coast Water Board's Executive Officer will base the decision to require monitoring on site-specific conditions, the size and location of the discharger's ownership, and/or the type and intensity of land uses being conducted or proposed by the discharger. If monitoring is required, the North Coast Water Board's Executive Officer may direct the discharger to develop a monitoring plan and may describe specific monitoring requirements to include in the plan.

6.3.8.8 Reassessment and Adaptive Management

The North Coast Water Board will review, reassess, and possibly revise the Shasta River TMDL Action Plan. Reassessment is likely to occur every three years during the Basin Planning Triennial Review process. North Coast Water Board staff will report to the North Coast Water Board at least yearly on the status and progress of implementation activities, and on whether current efforts are reasonably calculated and on track to achieve water quality standards. In addition to the evaluation periods for individual source categories specified in Table 6-25 North Coast Water Board staff will conduct a comprehensive and

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formal assessment of effectiveness of collaborative efforts in the ongoing programs and additional efforts recommended by the Action Plan within five years from the date of U.S. EPA approval (by January 26, 2012). A more extensive reassessment will occur ten years from the date the TMDL Action Plan is effective, or sooner, if the North Coast Water Board determines it necessary. During reassessment, the North Coast Water Board is likely to consider how effective the requirements of the TMDL Action Plan are at meeting the TMDLs, achieving dissolved oxygen and temperature water quality objectives, and protecting the beneficial uses of water in the Shasta River Watershed.

**Table 6-24: Shasta River Dissolved Oxygen and Temperature TMDL
Implementation Actions**

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

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	<p>Conservation District (Shasta Valley RCD)</p> <ul style="list-style-type: none"> Shasta Coordinated Resource Management and Planning Committee (Shasta CRMP) California Department of Fish and Wildlife (CDFW) 	<p>compliance with water quality standards, the TMDLs, and the NPS Policy, either individually or through the Shasta Valley RCD and its CRMP or through the CDFW Coho ITP.</p> <p>RCD Actions: The Shasta Valley RCD and its CRMP should: Assist landowners in developing and implementing management practices that minimize, control and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries.</p> <p>Assist landowners in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the range and riparian management actions taken by the landowner.</p> <p>State Actions: CDFW will: Assist landowners in developing and implementing management practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries.</p>

**Table 6-25: Shasta River Dissolved Oxygen and Temperature TMDL
Implementation Actions (cont.)**

Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Range and Riparian Land Management (cont.)	<ul style="list-style-type: none"> • CDFW (cont.) • North Coast Water Board 	<p>Administer the Coho Recovery Strategy and the ITP (when approved).</p> <p>The North Coast Water Board will: Work cooperatively with the Shasta Valley RCD and its CRMP to: Provide technical support and information to individuals, landowners, and community members in the Shasta River Watershed. Coordinate monitoring, educational and outreach efforts. Develop a monitoring program to evaluate and document implementation and effectiveness of the range and riparian management actions taken by the landowners.</p> <p>Should efforts fail to be implemented or effective, the North Coast Water Board's Executive Officer shall require, on a site specific as-needed basis, the appropriate responsible parties to develop, submit, and implement a ranch management plan designed to prevent discharges of fine sediment, nutrients and other oxygen consuming materials, as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries.</p> <p>The ranch management plan shall describe in detail: Locations discharging and/or with the potential to discharge nutrients and other oxygen consuming materials, and elevated solar radiation loads to watercourses which are caused by livestock grazing or related activities. How and when identified sites are to be controlled and monitored, and management practices that will be implemented to prevent and reduce future discharges of nutrient and other oxygen consuming materials, and elevated solar radiation loads to the Shasta River and its tributaries.</p> <p>Group and/or individual ranch management plans shall be implemented upon review, comment, and approval by North Coast Water Board staff and their Executive Officer for</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Range and Riparian Land Management (cont.)	North Coast Water Board (cont.)	<p>compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <p>The North Coast Water Board shall address the removal and suppression of vegetation that provides shade to a waterbody through development of a Stream and Wetland System Protection Policy. This will be a comprehensive, regionwide riparian policy that will address the importance of shade on instream water temperatures and will potentially propose riparian setbacks and buffer widths. The Policy will likely propose new rules and regulations, and will therefore take the form of an amendment to the Basin Plan. Other actions under this section may be modified for consistency with this policy, once adopted. With funding already available through a grant from the U.S. EPA, North Coast Water Board staff are scheduled to develop this Policy for North Coast Water Board consideration and adoption by the end of 2007.</p> <p>Within two years of U.S. EPA approval of the TMDL Action Plan (by January 26, 2009), the North Coast Water Board's Executive Officer shall report to the North Coast Water Board on the status of the preparation and development of appropriate permitting actions.</p> <p>The North Coast Water Board shall take appropriate permitting actions as necessary to address the removal and suppression of vegetation that provides shade to a waterbody in the Shasta River Watershed. Such actions may include, but are not limited to, prohibitions, waste discharge requirements (WDRs) or waivers of WDRs for grazing and rangeland activities, farming activities near waterbodies, streambank stabilization activities, and other land uses that may remove and/or suppress vegetation that provides shade to a waterbody. Should prohibitions, waivers or WDRs be developed, they may apply to the entire North Coast Region or just to the Shasta River Watershed.</p> <p>Within ten years of U.S. EPA approval of the TMDL (by January 26, 2017), all identified discharges associated with riparian land use activities shall be in compliance with water quality standards, the TMDLs, and the NPS Policy.</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Tailwater Return Flows	Irrigators Shasta Valley RCD Shasta CRMP	<p>Landowner Actions: Those that oversee and manage tailwater discharges from irrigated lands in the Shasta River Watershed, which may include landowners, lessees, and land managers (collectively referred to as irrigators), should employ land stewardship and irrigation management practices and activities that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries.</p> <p>Irrigators should implement the applicable management measures for tailwater return flows from the following sources: <i>Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy) (SWRCB 2004 or as amended).</i> <i>Shasta Watershed Restoration Plan (November 1997).</i> <i>Shasta Valley Resource Conservation District Master Incidental Take Permit (ITP) Application (Shasta RCD 2005).</i> <i>Recovery Strategy for California Coho Salmon (Coho Recovery Strategy) (CDFG 2004).</i></p> <p>See Appendix B of this Action Plan for examples of some of these tailwater return flow measures.</p> <p>In addition, landowners may develop and implement management measures suitable for their site-specific conditions.</p> <p>Irrigators should submit annually to the North Coast Water Board a written summary of all tailwater return flow management actions taken to help achieve compliance with water quality standards, the TMDLs, and the NPS Policy, either individually or through the Shasta Valley RCD and its CRMP or through the CDFW Coho ITP.</p> <p>RCD Actions: The Shasta Valley RCD and its CRMP should: Assist irrigators in developing and implementing management practices that minimize, control and preferably prevent discharges of fine sediment, nutrients and other</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Tailwater Return Flows (cont.)	Shasta Valley RCD and Shasta CRMP (cont.)	oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries.
	<p>CDFW</p> <p>North Coast Water Board</p>	<p>Implement the recommended actions specified in the Shasta Watershed Restoration Plan, Coho Recovery Strategy, and the ITP (when approved).</p> <p>Assist irrigators in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the tailwater management actions taken by the irrigators.</p> <p>State Actions: CDFW will: Assist irrigators in developing and implementing management practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries.</p> <p>Administer the Coho Recovery Strategy and the ITP (when approved).</p> <p>North Coast Water Board will: Work with the Shasta Valley RCD and its CRMP to develop a monitoring program to evaluate and document implementation and effectiveness of the tailwater management actions taken by the irrigators.</p> <p>Evaluate the effectiveness of tailwater management actions and develop recommendations for the most effective regulatory vehicle to bring tailwater discharges into compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <p>Should efforts fail to be implemented or effective, the North Coast Water Board's Executive Officer may require irrigators, on a site specific as-needed basis, to develop, submit, and implement, upon review, comment and</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
		<p>approval by the North Coast Water Board's Executive Officer, a tailwater management plan designed to prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated solar radiation loads from affecting waters of the Shasta River and its tributaries.</p> <p>Within one year of U.S. EPA approval of the TMDL (by January 26, 2008), the North Coast Water Board's Executive Officer shall report to the North Coast Water Board on the status of the preparation and development of appropriate permitting actions to bring the discharge into compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <p>Within five years of U.S. EPA approval of the TMDL (by January 26, 2012) and based on North Coast Water Board staff recommendation(s) derived from the evaluation phase for tailwater management, the North Coast Water Board shall adopt prohibitions, WDRs, waivers of WDRs, or any combination thereof, as appropriate.</p> <p>Within ten years of U.S. EPA approval of the TMDL (by January 26, 2017), the discharge of all tailwater return flow shall be in compliance with water quality standards, the TMDLs, and the NPS Policy.</p>
Water Use and Flow	Water Diverters	<p>Water Diverter(s) Actions: Water diverters should employ water management practices and activities that result in increased dedicated cold water instream flow in the Shasta River and its tributaries.</p> <p>Water diverters should participate in and implement applicable flow-related measures outlined in the following sources: <i>Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program</i> (NPS Policy) (SWRCB 2004 or as amended). <i>Shasta Watershed Restoration Plan</i> (November 1997). <i>Shasta Valley Resource Conservation District Master Incidental Take Permit (ITP) Application</i> (Shasta RCD 2005). <i>Recovery Strategy for California Coho Salmon</i> (Coho Recovery Strategy) (CDFW 2004).</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Water Use and Flow (cont.)		<p>See Appendix C of this Action Plan for examples of flow related measures.</p> <p>In addition, landowners may develop and implement management measures suitable for their site-specific conditions.</p> <p>Within two years (by January 26, 2009), and again within four years of U.S. EPA approval of the TMDL (by January 26, 2011), water diverters shall report in writing to the North Coast Water Board, either individually or through the Shasta Valley RCD and its CRMP, on the measures taken to increase the dedicated cold water instream flow in the Shasta River by 45 cfs or alternative flow regime that achieves the same temperature reductions from May 15 to October 15.</p> <p>Within five years of U.S.EPA approval of the TMDL (by January 26, 2012), water diverters shall provide a final report to the North Coast Water Board, either individually or through the Shasta Valley RCD and its CRMP, on documenting dedicated cold water instream flow in the Shasta River in relation to the 45 cfs goal or alternative flow regime that achieves the same temperature reductions from May 15 to October 15.</p> <p>This recommended flow measure does not alter or reallocate water rights in the Shasta or Klamath River watersheds, nor bind the North Coast Water Board in future TMDLs, the State Water Board's Division of Water Rights in any water rights decision, or state and federal courts.</p> <p>RCD Actions: The Shasta Valley RCD and its CRMP should: Assist water diverters in developing and implementing management practices that increase dedicated cold water instream flows in the Shasta River and tributaries.</p> <p>Assist water diverters in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the actions taken to increase dedicated cold water instream flows in the Shasta River.</p>
	Shasta Valley RCD	
	Shasta CRMP	
	CDFW	
	CDFW (cont.)	

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	<p>Department of Water Resources (DWR)</p> <p>North Coast Water Board</p> <p>State Water Resources Control Board (State Water Board)</p>	<p>State Actions: CDFW will: Assist water diverters in developing and implementing management practices that increase dedicated cold water instream flows in the Shasta River and tributaries. Administer the Coho Recovery Strategy and the ITP (when approved). Assist in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the actions taken by the water diverters to increase dedicated cold water instream flows in the Shasta River.</p> <p>DWR should: Coordinate and assist water diverters in developing and implementing a monitoring program through a watermaster service to evaluate and document implementation and effectiveness of the actions taken by the water diverters to increase dedicated cold water instream flows in the Shasta River.</p> <p>The North Coast Water Board will: Work cooperatively with water diverters, the Shasta Valley RCD and its CRMP, CDFG and DWR, wholly or in part, to establish monitoring and reporting programs to gauge implementation and effectiveness of the actions taken by responsible parties.</p> <p>If the Executive Officer receives credible evidence that the Shasta River flows are diminishing, the Executive Officer shall promptly report this to the North Coast Water Board and State Water Board.</p> <p>If after five years, the North Coast Water Board's Executive Officer finds that the above measures have failed to be implemented or are otherwise ineffective, the North Coast Water Board may recommend that the State Water Board consider seeking modifications to the decree (<i>In re Waters of Shasta River and its Tributaries</i>, No. 7035 (Super. Ct. Siskiyou County Dec. 29, 1932)), conducting proceedings under the public trust doctrine and/or conducting proceedings under the waste and unreasonable use</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
		provisions of the California Constitution and the California Water Code.
<p>Irrigation Control Structures, Flashboard Dams, and other Minor Impoundments</p> <p>(Collectively referred to as minor impoundments)</p>	<p>Individual Irrigators Irrigation Districts DWR</p> <p>Others owning, operating, managing, or anticipating construction of minor impoundments</p>	<p>Irrigator(s) Actions: Irrigation districts, individual irrigators, and others that own, operate, manage, or anticipate constructing instream minor impoundments or other structures capable of blocking, impounding, or otherwise impeding the free flow of water in the Shasta River system shall comply with one or more of the following measures: Permanently remove minor impoundments in the Shasta River mainstem. Re-engineer existing impoundments to decrease surface area of impoundment. Not construct new impoundments unless they can be shown to have positive effects to the beneficial uses of water relative to water quality compliance and the support of beneficial uses, including the salmonid fishery, in the Shasta Valley.</p> <p>Within one year of U.S. EPA approval of the TMDL (by January 26, 2008), report in writing to the North Coast Water Board methods and management practices they shall implement that will reduce sediment oxygen demand rates by 50% from baseline behind all minor impoundments.</p>
Minor impoundments (cont.)	<p>Shasta Valley RCD Shasta CRMP</p> <p>Shasta Valley RCD and Shasta CRMP (cont.)</p> <p>CDFW</p>	<p>RCD Actions: The Shasta Valley RCD and its CRMP should: Assist in developing and implementing minor impoundment removal, re-engineering or initial design work for compliance with water quality standards, the TMDLs, and the NPS Policy. Implement the recommended actions specified in the Shasta Watershed Restoration Plan and the ITP (when approved).</p> <p>Assist in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the actions taken to remove, re-engineer or limit construction of minor impoundments on the mainstem Shasta River.</p> <p>State Actions: CDFW will:</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	North Coast Water Board	<p>Assist in developing and implementing the removal, re-engineering, or limitation on the construction of minor impoundments in the Shasta River mainstem.</p> <p>Administer the Coho Recovery Strategy and the ITP (when approved).</p> <p>Assist in the development and implementation of a monitoring program to evaluate and document the implementation and effectiveness of the actions taken to remove, re-engineer, or limit construction of minor impoundments on the mainstem Shasta River.</p> <p>The North Coast Water Board will: Work with CDFW to establish monitoring and reporting elements of their programs in order to gage their effectiveness.</p> <p>Work with the Shasta Valley RCD and its CRMP to establish monitoring and reporting programs to gage the implementation and effectiveness of the Shasta Watershed Restoration Plan.</p> <p>Include appropriate conditions in Clean Water Act water quality certification permits for minor impoundment removal or re-engineering activities that comply with water quality standards, the TMDL, and the NPS Policy.</p>
Lake Shastina	Montague Water Conservation District (MWCD) City of Weed County of Siskiyou Caltrans Communities of Lake Shastina U.S. Forest Service (USFS) U.S. Bureau of Land Management (BLM)	<p>Within 2 years of U.S. EPA approval of the TMDL (by January 26, 2009), the responsible parties shall complete a study of water quality conditions and factors affecting water quality conditions in Lake Shastina, and develop a plan for addressing factors affecting water quality conditions to bring Lake Shastina into compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <p>The study and plan shall be submitted to the North Coast Water Board Executive Officer for review, comment and approval. Within 5 years of U.S. EPA approval of the TMDL (by January 26, 2012), the responsible parties shall begin implementing the plan.</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	Private timberland owners	
Dwinnell Dam	Montague Water Conservation District (MWCD)	Within 2 years of U.S. EPA approval of the TMDL (by January 26, 2009), the MWCD shall report in writing to the North Coast Water Board on a plan to bring the discharge from Dwinnell Dam into compliance with water quality standards, the TMDLs, and the NPS Policy.
City of Yreka Wastewater Treatment Facility (Yreka WWTF)	City of Yreka North Coast Water Board	<p>Yreka Wastewater Treatment Facility Actions: The Yreka WWTF shall comply with existing North Coast Water Board Orders and Monitoring and Reporting Programs.</p> <p>North Coast Water Board Actions: The North Coast Water Board will: Pursue aggressive compliance with Order No 96-69 and CAO No. R1-2004-0037. Continue vigorous oversight and enforcement of Monitoring and Reporting Program No. R1-2003-0047 to ensure timely submittal of sampling and analytical results from the operators of the Yreka WWTF.</p>
Urban and Suburban Runoff	City of Yreka City of Weed City of Montague Community of Edgewood Communities of Lake Shastina Other landowners with suburban runoff	<p>Actions: The cities of Yreka, Weed, Montague, the communities of Lake Shastina, and other landowners with suburban runoff should identify possible pollutants, their sources, and volumes of polluted runoff from urban and suburban sources within their spheres of influence that may discharge, directly or indirectly, to waters of the Shasta River Watershed.</p> <p>Cities and other landowners with suburban runoff should implement the applicable measures from the NPS Policy. See Appendix D of this Action Plan for examples of some of these applicable measures.</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	North Coast Water Board	<p>Within two years of U.S. EPA approval of the TMDL (by Jan. 2009), cities and landowners with suburban runoff shall develop a plan to minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials and elevated temperature waste discharge from affecting waters of the Shasta River and its tributaries. The plan shall be submitted to the North Coast Water Board's Executive Officer for review, comment and approval. Within 5 years of U.S. EPA approval of the TMDL (by Jan. 2012), cities and landowners with suburban runoff shall begin implementing the plan.</p> <p>State Actions: The North Coast Water Board will: Work cooperatively with responsible parties to implement their plan, including appropriate management measures and reasonable time schedules which minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials and elevated temperature waste discharge from affecting waters of the Shasta River and its tributaries.</p>
Activities on Federal Lands Activities on Federal Lands (cont.)	USFS	<p>USFS Actions: The USFS should consistently implement the best management practices for timber harvest activities, grazing, and other activities included in the: <i>Klamath National Forest Land and Resource Management Plan</i> (USFS 1995) or as amended as long as equivalent or better water quality protections are required. <i>Shasta-Trinity National Forest Land and Resource Management Plan</i> (USFS 1995) or as amended as long as equivalent or better water quality protections are required. <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USFS 2000) or as amended as long as equivalent or better water quality protections are required.</p> <p>See Appendix E of this Action Plan for some examples of these measures.</p> <p>North Coast Water Board Actions: The North Coast Water Board will:</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
	North Coast Water Board	Continue its involvement with the USFS to periodically reassess the mutually agreed upon goals of the 1981 Management Agency Agreement between the SWRCB and the USFS.
	BLM	<p>Work with the USFS to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the USFS within two years of U.S. EPA approval of the TMDL (by January 26, 2009). The MOU shall include, in part, buffer width requirements and other management practices as detailed in Appendix E.</p> <p>BLM Actions: BLM shall implement best management grazing strategies that are detailed in a joint management agency document titled: <i>Riparian Management, TR 1737-14, Grazing Management for Riparian-Wetland Areas, USDI-BLM, USDA-FS (1997).</i></p> <p>See Appendix F of this Action Plan for some examples of these measures.</p>
	North Coast Water Board	<p>North Coast Water Board Actions: The North Coast Water Board will work with the BLM to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the BLM within two years of U.S. EPA approval of the TMDL (by January 26, 2009). The MOU shall include buffer width requirements and other management practices as detailed in Appendix F of this Action Plan.</p>
Timber Harvest Activities on Non-Federal Lands	Private Parties Conducting Timber Harvest Activities	<p>Timber Harvest Related Actions: Parties conducting timber harvest activities should employ land stewardship practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials from affecting waters of the Shasta River and tributaries. Landowners should also employ land stewardship practices and activities that minimize, control, and preferably prevent elevated solar radiation loads from affecting waters of the Shasta River and its Class I and II tributaries.</p> <p>State Actions:</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Timber Harvest Activities on Non-Federal Lands (cont.)	California Department of Forestry (CDF)	CDF will: Ensure timber operations in the Shasta River Watershed are in compliance with the water quality standards, the TMDLs, and NPS Policy.
	North Coast Water Board	<p>North Coast Water Board Actions: The North Coast Water Board shall use appropriate permitting and enforcement tools to regulate discharges from timber harvest activities in the Shasta River Watershed, including, but not limited to: Participation in the CDF timber harvest review and approval process. Use of general or specific WDRs and waivers of WDRs, if applicable, to regulate timber harvest activities on private lands in the Shasta River Watershed. Timber harvest activities on private lands in the Shasta River Watershed are not eligible for Categorical Waiver C included in the Categorical Waiver of <i>Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region</i> (Order No. R1-2004-0016) simply through the adoption of this TMDL Action Plan. However, timber harvest activities on private lands in the Shasta River Watershed may be eligible for Categorical Waivers A, B, D, E, and F, as appropriate.</p> <p>If the California Forest Practice Rules (Title 14 CCR Chapters 4, 4.5 and 10) are changed in a manner that reduces water quality protections, the North Coast Water Board shall require plan submitters to maintain the level of water quality protection provided by the 2006 Forest Practice Rules.</p> <p>See Appendix G of this Action Plan for select examples of 2006 Forest Practice Rules.</p>
California Department of Transportation Activities (Caltrans)	Caltrans North Coast Water Board	<p>Caltrans Actions: Caltrans shall implement the requirements of its stormwater program.</p> <p>North Coast Water Board Actions: North Coast Water Board shall: Within two years of U.S. EPA approval of the TMDL (by January 26, 2009), complete an initial evaluation of the Caltrans Stormwater Program.</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
		After the initial two-year evaluation is completed, the North Coast Water Board shall continue periodic reviews of the program to assure ongoing compliance.

6.3.8.9 Glossary

Adjusted Potential Effective Shade:

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

Biochemical Oxygen Demand (CBOD):

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

Carbonaceous Deoxygenation:

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

Class I Tributary:

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

Class II Tributary:

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

Compliance and Trend Monitoring:

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

Dedicated Cold Water Instream Flow:

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

Implementation Monitoring:

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

Instream Effectiveness Monitoring:

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

Irrigation Return Flows:

See Tailwater Return Flow.

Natural Potential Vegetation Conditions:

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

Nitrification:

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

Nitrogenous Deoxygenation:

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

Nitrogenous Biochemical Oxygen Demand (NBOD):

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

Nitrogenous Oxygen Demand:

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

Potential Effective Riparian Shade:

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

Potential Solar Radiation Transmittance:

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

Reaeration:

The process whereby atmospheric oxygen is transferred to a waterbody.

Salmonids:

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

Sediment:

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

Sediment Oxygen Demand (SOD):

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

Solar Radiation Transmittance:

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

Tailwater Return Flow:

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

Water Quality Compliance Model Scenario:

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

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Shasta River TMDL Action Plan - Appendix A

Range and Riparian Land Management Measures
<p>(1) Protect sensitive areas (including streambanks, lakes, wetlands, estuaries, and riparian zones) by (a) excluding livestock, (b) providing stream crossings or hardened access to watering areas, (c) providing alternative water locations away from surface water, (d) locating salt and additional shade, if needed, away from sensitive areas, or (e) use improved grazing management (e.g. herding) to reduce the physical disturbance and direct loading of animal waste and sediment caused by livestock; and (2) Achieve the following on range, pasture and other grazing lands not addressed under (1) above: implement the range and pasture components of a Resource Management Systems (RMS) as defined in the United States Department of Agriculture (USDA) Natural Resource CS Field Office Technical Guide applying the progressive planning approach of the USDA NRCS to reduce erosion. NPS Policy (MM 1E) (SWRCB, 2004)</p>
<p>On properties owned by participants in the ITP, livestock fencing shall be in place on at least 90% of that person's owned stream bank length where there is a potential to affect coho, or fencing shall be in active progress towards implementation along those streams with installation by January 1, 2008, and/or shall have CDFW approved livestock management measures in place that will provide similar protections to the streambanks and riparian zone. Livestock riparian exclusion fencing built after 3-30-05 needing to comply with the permit must be approved by SVRCD, will be expected to have a setback of at least 35 feet from normal high water line, and shall be maintained in good working order as long as the permit is in place and livestock are present. Draft Shasta ITP (Minimization Measures B) (RCD, 2005)</p>
<p>SVRCD will work with landowners and CDFW on appropriate methodology and riparian species selection on a site by site basis. Draft Shasta ITP (Minimization Measures C) (RCD, 2005)</p>
<p>Grazing along the steam corridor may occur as a mechanism of riparian management and will be coordinated with the SVRCD, the landowners and CDFW staff. Draft Shasta ITP (Table 1-1) (RCD, 2005)</p>
<p>Planting of riparian vegetation along stream banks will be coordinated with the SVRCD, the landowners and CDFW staff. Draft Shasta ITP (Table 1-1) (Table 1-1) (RCD, 2005)</p>
<p>Address factors that contribute to high temperatures. Coho Recovery Strategy (HM-5a, b) (CDFG, 2004)</p>
<p>Promote coho salmon recovery by minimizing diversion entrainment, protecting riparian vegetation, and encouraging effective land use practices. Coho Recovery Strategy (P-1 through P-7) (CDFG, 2004)</p>
<p>Increase riparian vegetation. Coho Recovery Strategy (HM-4a-d) (CDFG, 2004)</p>
<p>Continue program of riparian fencing and native tree planting. Shasta Watershed Restoration Plan (SRCRMP, 1997)</p>

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Shasta River TMDL Action Plan - Appendix B

Tailwater Return Flow Management Measures

Develop and implement comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or waterbodies listed as impaired by nutrients. Such plans would include a plant tissue analysis to determine crop nutrient needs; crop nutrient budget; identification of the types, amounts, and timing of nutrients necessary to produce a crop based on realistic crop yield expectations; identification of hazards to the site and adjacent environment; soil sampling and tests to determine crop nutrient needs; and proper calibration of nutrient equipment. When manure from confined animal facilities is to be used as a soil amendment and/or is disposed of on land, the plan shall discuss steps to assure that subsequent irrigation of that land does not leach excess nutrients to surface or groundwater.

NPS Policy (MM 1C) (SWRCB, 2004)

Capture of additional tailwater from on-site or neighboring fields. **Draft Shasta ITP (Table 1-1) (RCD, 2005)**

The Shasta RCD will assist landowners/sub-permittees in designing and implementing tailwater capture systems that intercepts and reuses runoff from on-site and off-site properties in accordance to standards outlined by the NRCS. **Draft Shasta ITP (Table 1-1) (RCD, 2005)**

Conduct assessments of tailwater return flows, promote opportunities to eliminate, minimize, reclaim and reuse, where feasible. **Coho Recovery Strategy (WUE-7a-c) (CDFG, 2004)**

Manage tailwater return flows so that entrained constituents, such as fertilizers, fine sediment and suspended organic particles, and other oxygen consuming materials are not discharged to nearby watercourses. This could include modifications to irrigation systems that reuse tailwater by constructing off-stream retention basins, active (pumping) and or passive (gravity) tailwater recapture/redistribution systems. **(U.C. Davis 1998; NRCS 1997)**

Seek ways to reduce irrigation tailwater, or capture for reuse. Shasta Watershed Restoration Plan **(SRCRMP, 1997)**

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Shasta River TMDL Action Plan - Appendix C

Instream Flow Management Measures
<p>Promote effective irrigation while reducing pollutant delivery to surface water and groundwater. Pursuant to this measure, irrigation water would be applied uniformly based on an accurate measurement of cropwater needs and the volume of irrigation water applied, considering limitations raised by such issues as water rights, pollutant concentrations, water delivery restrictions, salt control, wetland, water supply and frost/freeze temperature management. Additional precautions would apply when chemicals are applied through irrigation. NPS Policy (MM 1F) (SWRCB, 2004)</p>
<p>All persons covered by the permit and diverting water from within the Shasta River Watershed will be expected to support ongoing watermaster services (either by DWR or by some other entity should DWR cease to provide service) and pay their proportionate cost of that service to provide watermaster service in the Shasta Valley between April 1 and October 1 when instream flows are likely to be most critical to coho. Individual proportional costs for this activity are expected to continue to be collected by the County of Siskiyou via annual property taxes. Those participants exercising riparian rights and not subject to watermaster control will cooperate with the watermaster in assuring they are within their legal rights and will inform the watermaster of any changes in the quantities of water they will be diverting. Draft Shasta ITP (Avoidance Measures III. A. i.) (RCD, 2005)</p>
<p>CDFW, DWR and the SVRCD shall develop and implement a management plan to coordinate and monitor irrigation season start up so as to minimize rapid deductions in instream flows. A draft Ramped Diversion Plan will be submitted to CDFW by January 1, 2007 with a finalized plan submitted by January 1, 2008. Draft Shasta ITP (Avoidance Measures III. A. ii.) (RCD, 2005)</p>
<p>All persons covered by the ITP shall endorse continued efforts by DWR or other private watermaster organizations, to assure that flows year round shall not be allowed to fall below 20 cfs at the Shasta River near Montague (SRM) gage, a quantity that has been historically the watermaster's minimum target for flow at that location, nor that flows at A-12 shall fall below 45 cfs at any time during the summer, a quantity that will assure that substantial cold water refugia areas are retained upstream of the point. Draft Shasta ITP (Avoidance Measures III. A. iii.) (RCD, 2005)</p>
<p>The SVRCD will develop a dry and critically dry year plan to assure that stranding, or elimination of needed cold water refugia areas does not occur during extremely dry years. The dry year plan will be developed by SVRCD and will ensure that previously described flows at 50 cfs at A-12 and 20 cfs at Montague-Grenada Road are achieved. A draft Dry Year Plan will be completed by the SVRCD one year from the issuance of the permit. Draft Shasta ITP (Avoidance Measures III. F) (RCD, 2005)</p>
<p>The SVRCD will work with those entities seeking coverage under the ITP to assist them in their efforts to upgrade overall irrigation efficiency. Potential projects that may be implemented to improve flows include upgrade of water delivery systems to reduce waste, upgrade of water application systems, monitoring crop water requirements vs. soil moisture, etc. Draft Shasta ITP (Minimization Measures V. A. i.) (RCD, 2005)</p>

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Instream Flow Management Measures
Encourage the Shasta CRMP to develop a dry year water plan for the Shasta River. Shasta Coho Recovery Strategy (WM-1a) (CDFW, 2004)
Add additional oversight and more people to verify water use and better manage water in current watermaster service areas. Coho Recovery Strategy (WM-2a) (CDFW, 2004)
Institute a cooperative agreement between diverters to stage/stagger their irrigation starts and completions (ramped flows) to gradually change flows over several days. Coho Recovery Strategy (WM-3a) (CDFW, 2004)
CRMP, CDFW, and voluntary landowner participation: agree to pull diversions for a limited time period to produce a pulsed flow downstream. Coho Recovery Strategy (WM-4a)
Determine unused diversion rights and approach those diverters about providing flows for instream use without affecting the water rights of others. Coho Recovery Strategy (WM-5c) (CDFW, 2004)
For critical streams/reaches, diverters could rotate irrigations so diversions do not coincide when increased flows are critical for fish. Coho Recovery Strategy (WM-6a)
Provide headgates and measuring devices for diversions located in riparian areas. Coho Recovery Strategy (WM-7a) (CDFW, 2004)
Study and forecast correlation of stream flow with other parameters to predict weekly flow rates. Can be based on snow surveys, precipitation, aquifer condition, etc. Coho Recovery Strategy (WM-8b) (CDFW, 2004)
Seek funding to conduct instream flow studies to determine flow-habitat relationships. Coho Recovery Strategy (WM-9) (CDFW, 2004)
Provide a structured process for willing participants to donate, sell, or lease water rights to provide improved stream flow. Coho Recovery Strategy (WA-1b, c, d & WA-7a, b, c) (CDFW, 2004)
Acquire water rights that shall be dedicated to instream flow. Coho Recovery Strategy (WA-7) (CDFW, 2004)
Support preparation of a water balance study. Apply study results to water management, augmentations, and habitat enhancement recommendations. Coho Recovery Strategy (WM-1b) (CDFW, 2004)
Study feasibility of building storage reservoirs to capture excess winter runoff (solely) for the benefit of coho salmon, not for irrigation augmentation. Coho Recovery Strategy (WA-2a & WA-3b) (CDFW, 2004)
Identify and prioritize benefits and/or detriments to lining/piping surface ditch systems; promote ongoing diversion ditch maintenance. Coho Recovery Strategy (WUE-3; WUE-4) (CDFW, 2004)
Promote and/or retain water efficient irrigation practices. Coho Recovery Strategy (WUE-5a-e) (CDFW, 2004)

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Instream Flow Management Measures
Prepare a comprehensive groundwater study to determine the current status of groundwater in the Shasta Valley and its relationship to surface flows. Coho Recovery Strategy (WM-10a) (CDFW, 2004)
Continue pulsed flow program to flush salmonids downstream during lethal water temperature conditions. Shasta Watershed Restoration Plan (I B-2) (SRCRMP, 1997)
Support creation of dedicated instream flows for fish and wildlife. Shasta Watershed Restoration Plan (I B-2) (SRCRMP, 1997)
Contemplate the impacts of readjudication of both surface water and groundwater. Shasta Watershed Restoration Plan (I B-9) (SRCRMP, 1997)
Continue pulse flows until water quality is improved. Shasta Watershed Restoration Plan (III B-3.e) (SRCRMP, 1997)
Seek funding for purchase of water for instream flows from willing sellers. Shasta Watershed Restoration Plan (III B-6) (SRCRMP, 1997)
Where other means of adequate protection (for fish) are unlikely, support the purchase of key (property) areas from voluntary sellers whose sale would protect remaining land uses in the Shasta Valley. Shasta Watershed Restoration Plan (III B-7) (SRCRMP, 1997)

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Shasta River TMDL Action Plan - Appendix D

Urban and Suburban Runoff Management Measures
<p>Develop a watershed protection program to</p> <ol style="list-style-type: none">1. Avoid conversion, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss;2. Preserve areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota;3. Protect to the extent practicable the natural integrity of water bodies and natural drainage systems associated with site development – including roads, highways and bridges;4. Limit increases of impervious surfaces; and5. Provide education and outreach to address NPS pollution. <p>NPS Policy (MM 3.1A) (SWRCB, 2004)</p>
<p>Plan, design and develop sites to:</p> <ol style="list-style-type: none">1. Protect areas that provide important water quality benefits necessary to maintain riparian and aquatic biota, and/or are particularly susceptible to erosion or sediment loss;2. Limit increase in impervious areas;3. Limit land disturbance activities such as clearing and grading and cut and fill to reduce sediment loss; and4. Limit disturbance of natural drainage features and vegetation. <p>NPS Policy (MM 3.1B) (SWRCB, 2004)</p>
<p>By design or performance:</p> <ol style="list-style-type: none">1. After construction has been completed and the site is permanently stabilized, reduce the average total suspended solids (TSS) loading by 80 percent (for purposes of this measure, an 80 percent TSS reduction is to be determined on an average annual basis); or2. Reduce the post-development loading of TSS so that the average annual TSS loadings are no greater than pre-development loadings.3. To the extent practicable, maintain post-development peak runoff rate and average volume at levels similar to pre-development levels. <p>NPS Policy (MM 3.1C) (SWRCB, 2004)</p>
<p>Limit application, generation, and mitigation of toxic substances;</p> <ol style="list-style-type: none">1. Ensure the proper storage and disposal of toxic materials;2. Apply nutrients at rates necessary to establish and maintain vegetation without causing nutrient runoff to surface waters; and3. Prepare and implement, prior to the use or storage of toxic material on site, an effective, approved chemical control plan or similar administrative document that contains chemical control provisions (e.g. minimize use of toxic materials; ensure proper containment if toxic materials are to be used /stored on site). <p>NPS Policy (MM 3.2.B) (SWRCB, 2004)</p>
<p>Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development:</p> <ol style="list-style-type: none">1. Identify priority local and/or regional watershed pollutant reduction opportunities (e.g. improve existing urban runoff control structures);2. Specify a schedule for implementing appropriate controls:

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3. Limit destruction of natural conveyance systems; and
4. Where appropriate, preserve, enhance, or establish buffers along surface waters and their tributaries.

NPS Policy (MM 3.3A) (SWRCB, 2004)

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Shasta River TMDL Action Plan - Appendix E
Recommended Interim Riparian Reserve Widths for Klamath National
Forest and Shasta-Trinity National Forest Lands in the Shasta River
Watershed¹⁰⁵

Riparian Reserve Type	Riparian Reserve Widths
Fish-bearing streams	Include the stream and: area on each side from active channel edges to the top of inner gorge, or outer edge of 100 year flood plain, or to outer edge of riparian vegetation, or height of two site potential trees ³⁴ , or 300 feet slope distance, whichever is greatest.
Perennial, non-fish bearing streams	Include the stream and: area on each side from active channel edges to the top of inner gorge, or outer edge of 100 year flood plain, or outer edge of riparian vegetation, or height of one site potential tree ¹⁰⁶ , or 150 feet slope distance, whichever is greatest.
Lakes and natural ponds	Include the body of water and: area to the outer edge of riparian vegetation, or extent of seasonally saturated soil, or extent of unstable and potentially unstable areas, or height of one site potential tree ³⁴ , or 300 feet slope distance, whichever is greatest.
Constructed ponds, reservoirs and wetlands >1-acre in size	Include the body of water or wetland and: area to outer edges of riparian vegetation, or to seasonally saturated soil, or the extent of unstable and potentially unstable areas, or distance of one site potential tree, or 150 feet slope distance from wetland edge >1 acre, or the maximum pool elevation of constructed ponds, reservoirs, whichever is greatest.
Seasonally flowing or intermittent streams ¹⁰⁷ wetlands <1-acre in size, and unstable or potentially unstable areas	At a minimum include: extent of unstable and potentially unstable areas (includes earthflows), stream channel and extend to top of inner gorge, stream channel or wetland and area from the edges of the stream channel or wetland to outer edges of riparian vegetation, and extension from edges of stream channel to height of one site potential tree ³⁴ , or 100 feet slope distance, whichever is greatest.

¹⁰⁵ Information from the Land and Resource Management Plans for the Klamath and Shasta-Trinity National Forests, Klamath National Forest LRMP (1995), Shasta-Trinity National Forest LRMP (1995).

¹⁰⁶ Site potential tree, depending on site class, is an average maximum height of the tallest dominant tree, ≥ 200 years old.

¹⁰⁷ Intermittent stream defined as any nonpermanent flowing drainage feature with a definable channel having evidence of annual scour or deposition, includes ephemeral streams meeting these physical criteria.

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Grazing Standards and Guidelines for Shasta-Trinity and Klamath National Forests¹⁰⁸
Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives. If adjusting practices is not effective, eliminate grazing.
Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside the Riparian Reserve, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.
Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.

¹⁰⁸ From Shasta - Trinity LRMP

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Shasta River TMDL Action Plan - Appendix F

BLM Grazing Management Measures¹⁰⁹
Grazing management must provide an adequate cover and height of vegetation on the banks and overflow zones to promote natural stream function (sediment filtering, bank building, flood energy dissipation, aquifer recharge and water storage).
Control the timing of grazing to prevent damage to streambanks when they are most vulnerable to trampling.
Ensure sufficient vegetation during periods of high flow to protect streambanks, dissipate energy, and trap sediment.
Techniques that restrict livestock from riparian areas, including fencing or fence relocation, barriers such as thickets or brush wind rows, water gaps in erosion-resistant stream reaches, hardened crossings or water access, and relocation of bed grounds and management facilities.

Shasta River TMDL Action Plan - Appendix G

Examples of Select Management Measures for Timber Harvest Activities on Non-federal Lands from the 2006 California Forest Practice Rules
Every timber operation shall be planned and conducted to prevent deleterious interference with watershed conditions that primarily limit the values set forth in “the rules” (e.g. sediment load increase where sediment is the limiting factor, thermal load increase where water temperature is the primary limiting factor, etc). Section 916.9, 936.9 (a)
Comply with the terms of a Total Maximum Daily Load that has been adopted to address factors that may be affected by timber operations, if a TMDL has been adopted, or not result in any measurable sediment load increase to watercourses of lakes. Section 916.9, 936.9 (a) (1)
Not result in any measurable stream flow reduction during critical low water periods except as part of an approved water drafting plan. Section 916.9, 936.9 (a) (4)
Protect maintain and restore the quality and quantity of vegetative canopy needed to: (a) provide shade to the watercourse or lake, (b) minimize daily and seasonal temperature fluctuations, and (c) maintain daily and seasonal temperature within the preferred range for anadromous salmonids. Section 916.9, 936.9 (a) (6)
Any timber operations or silvicultural prescriptions within 150 feet of any Class I watercourse or lake transition line or 100 feet of any Class II watercourse or lake transition line shall have protection, maintenance, or restoration of beneficial uses of water or the populations and habitat of anadromous salmonids or listed aquatic or riparian-associated species as significant objectives. Section 916.9, 936.9 (c)
The minimum Watercourse and Lake Protection Zone (WLPZ) width for Class I waters shall be 150 feet from the watercourse or lake transition line. Section 916.9, 936.9 (f)

¹⁰⁹ Riparian Management, TR 1737-14 1997, Grazing Management for Riparian-Wetland Areas, USDI-BLM, USDA-FS

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Within a WLPZ for Class I waters, at least 85 percent overstory canopy shall be retained within 75 feet of the watercourse or lake transition line. Section 916.9, 936.9 (g)

6.4 Additional Watershed Action Plans

6.4.1 Action Plan for Humboldt Bay Area

The purposes of this Action Plan for the Humboldt Bay Area are to:

1. Acknowledge progress which has been made in the protection and enhancement of Humboldt Bay since the original (1975) Basin Plan and the 1980 and 1988 updates;
2. Describe the current status of programs in the watershed; and
3. Describe the surveillance, monitoring and assessment activities necessary to provide ongoing protection and enhancement of the water quality of the Humboldt Bay Watershed.

6.4.1.1 Progress

The original (1975) action plan for the Humboldt Bay Area was intended to guide publicly-funded cleanup of the Bay. It envisioned full implementation of the State Water Board's 1974 "Water Quality Control Policy for Enclosed Bays and Estuaries" (SWRCB Resolution 74-43) and called for elimination of discharge of municipal wastewaters and industrial process waters (exclusive of cooling water discharges) to Humboldt Bay. That action plan allowed the North Coast Water Board to permit continued discharges based on findings that the wastewater in question would be consistently treated and discharged in a manner that would enhance the quality of receiving waters or beneficial uses above that which would occur in the absence of the discharge. NPDES permits were granted to the City of Eureka, the City of Arcata, and College of the Redwoods, in accordance with the State Water Board's 1974 "Water Quality Control Policy for Enclosed Bays and Estuaries". Six publicly-owned treatment works (POTW) discharges and numerous overflow-prone pumping stations have been eliminated. Hundreds of failure-prone on-site sewage disposal systems have been eliminated through the sewerage of those areas.

Since the 1970s, numerous other measures to protect and enhance the water quality and beneficial uses of Humboldt Bay have been successfully implemented through application of Basin Plan action plans, policies and programs administered by the North Coast Water Board and other state and local agencies.

While these accomplishments and assessments are important, water quality problems and concerns still exist in the Humboldt Bay area. As illustrated in the statewide Water Quality Assessment program, the Bay has been affected by point and nonpoint sources of water pollution and the potential for polluting episodes remains.

6.4.1.2 Bacterial Quality Concerns

The bacterial quality of Humboldt Bay is of particular concern due to the location of several of California's most important commercial oyster "farms" in the northern lobe of the estuary known as Arcata Bay. The shellfish harvest areas are classified by the California Department of Health Services according to several criteria, including their proximity to pollutant sources and the Department's knowledge that such areas are (or are not) of suitable sanitary quality. The Department is assisted in its classification process by close

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coordination with the North Coast Water Board, sewage management agencies, and the shellfish growers.

In Arcata Bay, shellfish harvest is permitted only in "Conditionally Approved" areas where water bacteriological quality meets the prescribed numerical standards described in Section 3 of this Plan, except during certain predictable periods. In this estuary, the exception occurs any time that a storm produces rainfall in excess of one-half inch within 24 hours. A harvest closure begins with each such storm and lasts for several days, depending on the storm pattern and intensity and the documented time required for "clearance" after the storm. This restriction recognizes that the bacterial quality of runoff into the Bay from all tributary watersheds causes the Bay waters to exceed the harvest-allowance standard.

In a federally-funded (Clean Water Act Section 208) study of the Bay in 1981-82, the North Coast Water Board assessed the relative contributions of bacteria-laden runoff from different representative land-use areas including agricultural (pasture), rural residential, and urban areas. All were shown to produce significant bacterial concentrations in stormwater runoff. The major contribution was from pasture and rangelands. The assessment estimated that, should this land use source be managed to preclude high-level bacterial discharges, there might be fewer days of shellfish harvest closure after each storm. The Department of Health Services, in its Humboldt Bay Management Plan, recognizes that such management has not been implemented.

6.4.1.3 Other Water Quality Concerns

Agricultural uses in the Humboldt Bay Watershed include permanent pasture, confined animal facilities, commercial-scale flower and bulb farms, and grazing. These activities may result in erosion and runoff, producing discharges of sediment, nutrients, bacteria, and pesticides. Bacteria-laden runoff has been identified as the primary agriculturally-related discharge in the Humboldt Bay watershed. Continued North Coast Water Board review and monitoring of agricultural activities is necessary.

Forestry activities in the watershed include timber harvesting, road construction, site preparation, and herbicide application. Timberland owners located in the upper watershed areas will continue to file timber harvest plans on lands zoned for timber harvest production. Road construction and reconstruction within streamside management zones and concentration of logging operations in a watershed will be given special scrutiny to avoid individual and cumulative impacts on the streams.

Urban runoff is affected by past and current land uses which range from thousands of individual households and small businesses to several wood-product factories, each with actual or potential discharges of pollutants via stormwater runoff. The recent stormwater NPDES regulations and possible small-municipality regulations must be implemented to advance the management of runoff-borne pollutants. In addition, the North Coast Water Board has an active program to secure cleanup of contaminated soils, runoff and groundwater from such sites.

In addition, there are several sites around the bay where past spills and leaks have contaminated groundwater which discharges to the bay. The North Coast Water Board, local agencies, and responsible parties must utilize appropriate cleanup and abatement practices to address these problems.

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North Coast Water Board and local agency programs to assist small business owners in preventing discharges of polluting chemicals must also be implemented.

Continued surveillance, monitoring, and assessment of water quality and land use activities around Humboldt Bay, and implementation of the Bays and Estuaries Policy are necessary to assure protection and enhancement of Humboldt Bay and its beneficial uses.

Accordingly, the Action Plan for Humboldt Bay includes the following elements:

1. Discharger surveillance and monitoring;
2. Review and assessment of land use activities; and
3. Continued coordination with other state and local agencies with various responsibilities with regards to Humboldt Bay.

6.4.2 Action Plan for the Santa Rosa Area Interim Action Plan (1986 – 1990)¹¹⁰ for the Santa Rosa Area

On or before July 1, 1990, the North Coast Water Board will formally review this Interim Action Plan and may revoke authority to discharge under the provisions of the plan or may extend the interim compliance date providing the City of Santa Rosa demonstrates to the North Coast Water Board reasonable progress on the City's stated goal to eliminate direct disposal of treated waste in the Russian River.

1. There shall be no discharge of waste to the Russian River from the Laguna Regional Sewage Treatment Facility during the period of May 15 through September 30 each year. There shall be no discharge from the Laguna Regional Sewage Treatment Facility for all other periods except as follows:
 - A. To the extent possible, only advanced treated wastewater as defined in effluent limitations contained in an NDPES permit shall be discharged during October 1 to May 14. However, discharges of secondary treated wastewater as defined in effluent limitations contained in an NDPES permit meeting a median total coliform level of 23 MPN/100 ml from the Laguna Regional Sewage Treatment and Disposal Facilities may be discharged during October 1 to May 14 at rates not exceeding one percent of the flow of the Russian River. In any year, there shall be no discharge of secondary treated wastewater to the Russian River when the flow of the river as measured at Guerneville (USGS Gage No. 11-4670.00) is less than 1,000 cfs. In instances when secondary treated

¹¹⁰ On September 21, 1989, the North Coast Water Board adopted Resolution No. 89-111 which recognized the City of Santa Rosa's progress in complying with the Long-Range Plan for the Russian River and provides for continued application of the Interim Action Plan standards to the Santa Rosa area through July 1, 1995. Cease and Desist Order No. 92-147 adopted by the North Coast Water Board on December 10, 1992 extends the Interim Action Plan standards through September 30, 1997 and Cease and Desist Order No. 93-103 adopted by the North Coast Water Board on October 27, 1993 further extends the Interim Action Plan standards through September 30, 1999. This action plan will be amended at a future date.

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wastewater is discharged, the discharger shall submit a report documenting the reasons for such discharges. In no case when secondary treated wastewater is discharged in combination with advanced treated wastewater shall the total discharge exceed one percent of the flow of the Russian River.

- B. Discharge of advanced treated wastewater in accordance with an NDPES permit from the Laguna Regional Treatment and Disposal Facilities to the Russian River may be permitted during October 1 through May 14 when all the following conditions are met:
- i. The discharger shall meet a total coliform level of 2.2 MPN/100 ml;
 - ii. In any year, discharge shall not commence until after the flow of the Russian River initially reaches 1,000 cfs as measured at Guerneville (USGS Gage No. 11-46700.00) or until authorized by the North Coast Water Board or its Executive Officer. Such authorization shall be based on evidence that justifies the necessity for the discharge and that shows that all beneficial uses of the Russian River and tributaries will continue to be protected. The discharger shall document that system inflow has not exceeded the 1985 dry weather average plus incremental inflows not exceeding any irrigation and/or storage capacity added since 1985. Under wintertime (October 1 - May 14) drought conditions when the flow of the Russian River is less than 1,000 cfs, the North Coast Water Board or its Executive Officer may suspend authorization to discharge waste, if necessary, to protect the beneficial uses of the Russian River or its tributaries.
 - iii. Such discharge shall be limited to one percent of the flow of the Russian River except under the following conditions:
 - i. Discharges exceeding one percent of the flow of the Russian River shall be made in accordance with operating procedures to be incorporated into the NDPES permit for the Laguna Regional Wastewater Treatment Facilities. These operating procedures shall be designed to minimize the rate of discharge to the lowest percentage practicable, and to minimize the total volume of effluent discharged.
 - ii. In such instances, the discharger shall provide a report to the Executive Officer documenting the reasons for increased waste discharges. The report shall include the dates, rates, and volumes of waste discharges and the circumstances necessitating such discharges and documentation that all beneficial uses of the Russian River and tributaries will be protected and that system inflow has not exceeded the 1985 dry weather average plus incremental inflow not exceeding any irrigation and/or storage capacity added since 1985.
 - iv. In no case shall any discharge of advanced treated wastewater exceed five percent of the flow of the Russian River.

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6.4.3 Interim Action Plan for the Trinity River

The purposes of this action plan are to describe those activities in the Trinity River Watershed which implement the objectives listed below and to ensure a multi-agency collaborative approach to attainment of the objectives.

The Trinity River Division of the Central Valley Project, constructed in 1963 and operated by the United States Bureau of Reclamation, is a major water development project providing the transfer of water from the Trinity River to the Sacramento River Basin of California. Key features of the Trinity River Division are Lewiston Dam, Trinity Dam, and facilities which provide the diversion of runoff from the Trinity River Watershed into the Sacramento River Basin. The construction of the dams and the diversion of approximately 80% of the natural flows of the Trinity River resulted in significant changes in the river.

The reduced flows resulted in changes to the river's temperature regime and disrupted physical cues for migration and spawning of salmon. To mitigate for the loss of fisheries habitat resulting from the project construction, the Trinity River Fish Hatchery was constructed at the base of Lewiston Dam. The fish populations have not been sustained, however, and both salmon and steelhead trout populations have declined since 1964, some stocks to as little as 10% of former levels. Efforts are currently underway to expand and improve the operations of the fish hatchery.

To the extent that factors are controllable as stated in Section 3 of this plan, the following temperature objectives shall apply to the activities in the Trinity River.

Table 6-26: Temperature objectives that apply to the activities in the Trinity River

Daily Average Not to Exceed	Period	
60°F	July 1 - Sept. 14	Lewiston Dam to Douglas City Bridge
56°F	Sept. 15 - Oct. 1	Lewiston Dam to Douglas City Bridge
56°F	Oct. 1 - Dec. 31	Lewiston Dam to confluence of North Fork Trinity River

The North Coast Water Board recognizes that the controllability of temperatures in the Trinity River downstream of Trinity and Lewiston Reservoirs is dependent on both climatic conditions and the operation of diversions to the Sacramento River.

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The following ongoing efforts shall implement the temperature objective for the Trinity River:

The Trinity River Restoration Act (P.L. 98-541) authorized the Secretary of the Interior to formulate and implement a management program to restore fish and wildlife populations in the Trinity River Basin. To that end, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife formed the Trinity River Task Force in 1971 to study the fish and wildlife problems of the basin and to prepare a plan for identification and mitigation of the problems. Membership in the Trinity River Fishery Restoration Task Force now also includes the U.S. Bureau of Indian Affairs, the California Department of Water Resources, Trinity County, Humboldt County, the Hoopa Valley Tribe, the Yurok Tribe, the U.S. Forest Service, the Bureau of Land Management, the U.S. Soil Conservation Service, the NOAA Fisheries, the California Department of Forestry and Fire Protection, and the State Water Resources Control Board.

The Trinity River Task Force shall seek to achieve the temperature objectives listed above through its individual and collective authorities. In addition, the authorities shall strive to optimize Trinity River restoration efforts through the efficient and balanced use of cold water reserves from Trinity and Lewiston reservoirs.

In 1981, the U.S. Fish and Wildlife Service and the Water and Power Resources Service of the Central Valley Project entered into an agreement, signed by the Secretary of the Interior, to work cooperatively to halt further fishery declines and to begin an effective restoration program in the Trinity River. In recognizing the problem of balancing the needs to sustain the fishery resources in the Trinity River and the uses outside of the basin for water and power, the agreement established flow allocations for normal, dry, and critically dry years for a period of twelve years. At the end of the twelve-year evaluation period, the agreement calls for the U.S. Fish and Wildlife Service to submit a report to the Secretary of the Interior which summarizes the effectiveness of restoration of flows and recommends an appropriate course of action for future management of Trinity River flows. The twelve-year evaluation period began in 1985 and is scheduled for completion in 1996. The agreement also recognizes the need for the completion of a Fish and Wildlife Management Plan by the Trinity River Task Force, and its implementation to successfully restore the anadromous resources of the Trinity River Basin.

Because of the successive dry-weather conditions since 1985 and the subsequent release of reduced flows to the Trinity River, the Secretary of the Interior amended the 1981 agreement to provide increased flows to the Trinity River in 1991 and in successive years until the U.S. Fish and Wildlife Service completes its study of the Trinity River flows.

As information from the twelve-year study becomes available, the North Coast Water Board shall review the effectiveness of this action plan in attaining the water temperature objectives.

In 1985 the Bureau of Reclamation entered into a cooperative agreement with the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and NOAA Fisheries to coordinate the operations of the Trinity River Division which impact the fishery resources. To that end, the agencies together attempt to establish the timing and the proportion of releases from Trinity Dam and Lewiston Dam which would most efficiently utilize the cold water reserves available for use by the anadromous fishery.

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The above agencies shall collaborate to implement the objectives set forth in this plan, and shall apprise the North Coast Water Board of the progress of this effort on an annual basis.

The State Water Board issued Orders WR 90-5 and 91-01 on May 5, 1990 and January 10, 1991, which set terms and conditions for fishery protection and set a schedule for completion of tasks for the thirty-two water rights permits, licenses, permitted applications and licensed applications for the Bureau of Reclamation's Central Valley Project. The orders included seven pending permitted applications for the diversion of cold water reserves from the Trinity River. The Orders recognized that protection of the upper Sacramento River fishery by means of water diversions from the Trinity River may adversely affect the Trinity River if not properly controlled, and chose to prevent and avoid any adverse effects to the Trinity River fishery as a result of the Order. The State Water Board will consider the comprehensive protection for the Trinity River fishery in a separate water rights proceeding in the near future. The State Water Board will consider the objectives set forth in this action plan in its future water rights proceedings for the Trinity River.

This action plan forms the basis for a collaborative approach to the management of fishery resources in the Trinity River and attainment of the water quality objectives.

The North Coast Water Board will periodically review this action plan and information resulting from temperature and fishery studies in the drainage and other areas to determine the need for modification.

6.4.4 Policy on the Control of Water Quality With Respect to On-Site Waste Treatment and Disposal Practices Specific to the Russian River Watershed, Including the Laguna De Santa Rosa

In accordance with Section 4.2.1 of the OWTS Policy, OWTS systems within the Russian River Watershed shall continue to follow the existing Basin Plan requirements as detailed below, until the North Coast Water Board adopts the Russian River pathogen indicator bacteria TMDL.

6.4.4.1 Objective

The North Coast Region is one of the fastest growing areas of California, with widespread and increasing dependence on on-site systems for sewage treatment and disposal. Due to ever-increasing costs, the ultimate construction of sewerage systems in developing areas can no longer be relied upon as a future solution to sewage disposal needs. More and more, on-site systems must be viewed as permanent means for waste treatment and disposal, capable of functioning properly for the life of the structure(s) served. The preponderance of adverse physical conditions throughout the North Coast Region necessitates careful evaluation of site suitability and design parameters for every on-site wastewater disposal system. This policy sets forth criteria and guidelines to protect water quality and to preclude health hazards and nuisance conditions arising from the subsurface discharge of waste from on-site waste treatment and disposal systems.

6.4.4.2 Findings

1. On-site waste treatment and disposal can be acceptable and successful. The success

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of the on-site system is dependent on suitable site location, adequate design, proper construction, and regular maintenance. Failure of the on-site system can result in water pollution and the creation of health hazards and nuisance conditions.

2. Waste from on-site systems must be disposed and disbursed below ground surface and away from high groundwater. There are existing parcels of land which, due to limitations in size, unsuitable soils, and/or high groundwater, cannot accommodate on-site waste disposal.
3. Division 7 of the California Water Code grants to the North Coast Water Board jurisdiction over all discharges of waste, including those from individual waste treatment and disposal systems or from community collection and disposal systems which utilize subsurface disposal. Local regulatory agencies, however, can most effectively control individual waste treatment and disposal systems, provided they strictly enforce ordinances and regulations designed to provide protection of water quality and the public health. Regulation of on-site systems on federal lands is beyond the jurisdiction of local agencies and must remain with the North Coast Water Board.
4. The many variations in physical conditions, population densities, and parcel sizes throughout the Russian River Watershed, including the Laguna de Santa Rosa (watershed) may affect the propriety of use of on-site water treatment and disposal systems. Adherence to the guidelines, criteria, and water conservation practices contained herein ordinarily will protect public health and water quality. Local regulatory agencies and the North Coast Water Board are encouraged to adopt more stringent regulations when warranted by local conditions.
5. Factors may arise which will justify less stringent requirements than set forth in the guidelines and siting and design criteria contained herein. Provision for waiver is included in this policy to address such situations.
6. On-site waste treatment and disposal systems can be an excellent sanitation device in rural and rural-urban areas. However, in areas where population densities are generally high and the availability of land is limited, on-site systems are not desirable. On-site waste treatment and disposal systems should not be permitted if adequate community sewerage systems are available or feasible.
7. Water conservation practices may protect present and future beneficial uses and public health, and may prevent nuisance and prolong the effective life of on-site wastewater treatment and disposal systems. However, water conservation practices do not reduce the need to size on-site systems as set forth in this policy.
8. The life of on-site wastewater treatment and disposal systems may be severely limited if improperly maintained. A means must be available to assure adequate maintenance of individual waste treatment and disposal systems. Management by public entities is encouraged wherever practicable.
9. Soil characteristics play a dominant role in the suitability of a site for subsurface sewage disposal. Increased emphasis on determining and utilizing soils information will improve site suitability evaluations.

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10. The installation of many on-site disposal systems within a given area may result in hydraulic interference between systems and adverse cumulative impacts on the quality of ground and surface waters. Physical solutions or limitations on waste load densities for land developments and other facilities may be necessary to avert such eventualities.
11. New technologies for on-site waste treatment and disposal continue to evolve. Means should be promoted to allow for timely and orderly consideration of promising alternative methods of waste treatment and disposal. Where alternative methods demonstrate enhanced performance, consideration may be given for utilization of different site criteria.
12. All aspects of on-site waste treatment and disposal would benefit from improved professional training and public education programs. Such training and education programs should be promoted by the North Coast Water Board in cooperation with local regulatory agencies and public and private sector professional associations.

6.4.4.3 Site Evaluation Criteria and Methods

A. Criteria

The following site criteria are considered necessary for the protection of water quality and the prevention of health hazards and nuisance conditions arising from the on-site discharge of wastes from residential and small commercial establishments. They shall be treated as standards for assessing site suitability for such systems. Waiver of individual criterion may be made in accordance with the "Provision for Waiver" contained in this policy. Systems resulting in large wastewater loads may require additional criteria which are not covered in this policy, and which will require review by the North Coast Water Board on a case by case basis.

1. Subsurface Disposal

On-site waste treatment and disposal systems shall be located, designed, constructed, and operated in a manner to ensure that effluent does not surface at any time, and that percolation of effluent will not adversely affect beneficial uses of waters of the state.

2. Ground Slope and Stability

Natural ground slope in all areas to be used for effluent disposal shall not be greater than 30 percent.

All soils to be utilized for effluent disposal shall be stable.

3. Soil Depth

Soil depth is measured vertically to the point where bedrock, hardpan, impermeable soils or saturated soils are encountered.

The minimum soil depth immediately below the leaching trench shall be three feet.

Lesser soil depths may be granted only as a waiver or for alternative systems.

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4. Depth to Groundwater

Minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench shall be determined from Figure 6-6.

5. Percolation Rates

Percolation test results in the effluent disposal area shall not be less than one inch per 60 minutes (60 MPI) for conventional leaching trenches. Percolation rates of less than one inch per 60 minutes (60 MPI) may be granted as a waiver or for alternative systems.

6. Setback Distances

Minimum setback distances for various features of individual waste treatment and disposal systems shall be as shown below in Table 6-27.

7. Replacement Area

An adequate replacement area equivalent to and separate from the initial effluent disposal area shall be reserved at the time of site approval. The replacement system area shall not be disturbed to the extent that it is no longer suitable for wastewater disposal. The replacement system area shall not be used for the following: construction of buildings, parking lots or parking areas, driveways, swimming pools, or any other use that may adversely affect the replacement area.

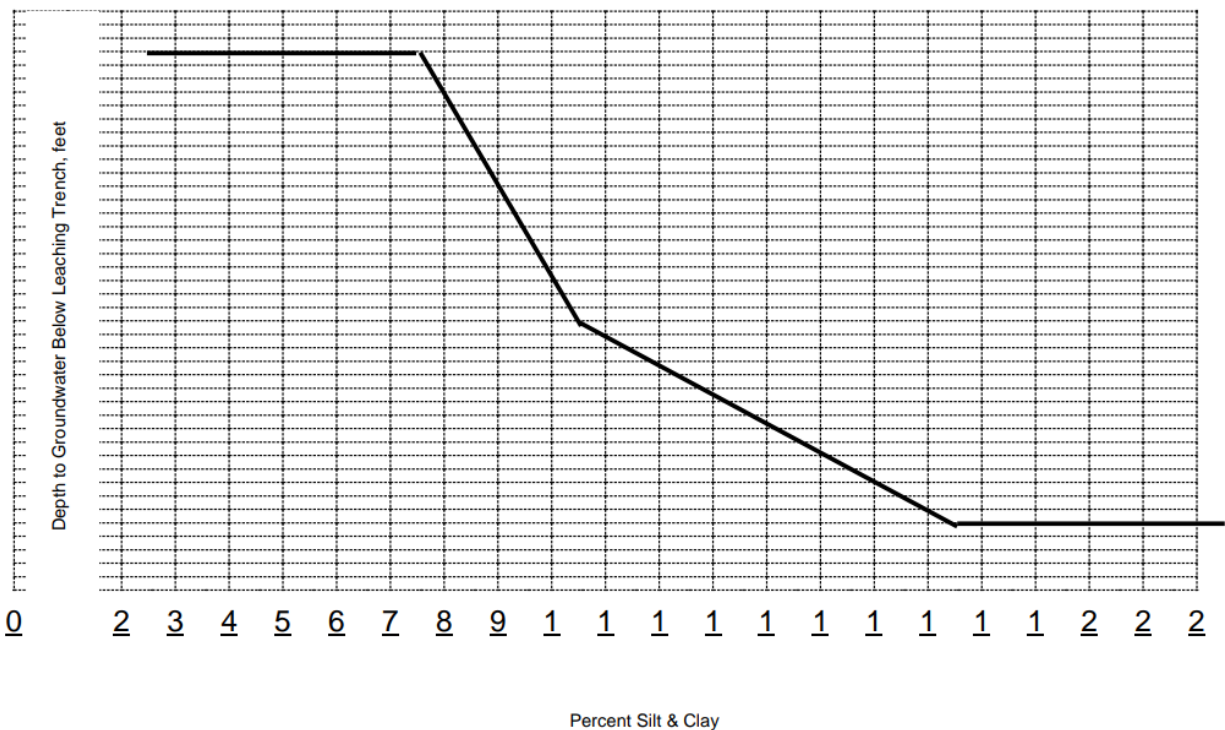


Figure 6-6: Minimum Depth to Groundwater Below Leaching Trench

Notes:

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1. The Silt & Clay content shall be determined after adjustment for coarse fragments as indicated in the method set forth in Figure 6-6, and must exist for a minimum of three feet between the bottom of the leaching trench and groundwater.
2. For percolation rates slower than 5 mpi, a minimum depth to groundwater below the leaching trench shall be five feet.
3. For soils having greater than 15% Silt & Clay, lesser depths to groundwater, to a minimum depth of two feet below the leaching trench, may be granted only as a waiver or for alternative systems.

Table 6-27: Minimum Setback Distances (Feet)

Facility	Well	Perennially Flowing Stream ¹	Ephemeral Stream ²	Ocean, Lake, or Reservoir ₃	Cut Banks, Natural Bluffs, and Sharp Changes in Slope	Unstable Land Forms
Septic Tank/Sump	100	50	25	50	25	50
Leaching Field	100	100	50	100	25	50

1. As measured from the line which defines the limit of 10 year frequency flood.
2. As measured from the edge of the watercourse.
3. As measured from the high-water line.
4. Where soil depth or depth to groundwater below the leaching trench are less than five feet, a minimum set back distance of 50 feet shall be required.

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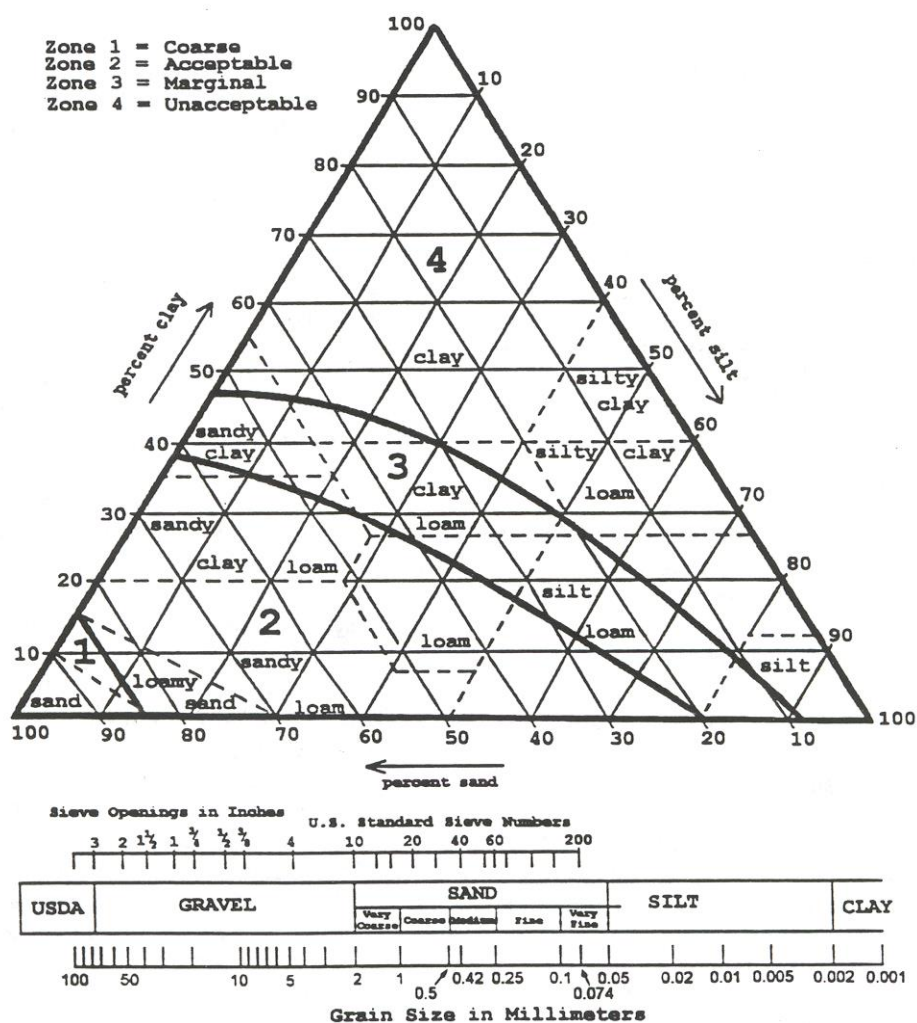


Figure 6-7: SOIL PERCOLATION SUITABILITY CHART FOR ON-SITE WASTE TREATMENT SYSTEMS

Instructions for Figure 6-7:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the 100 percent sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the 100 percent clay direction an additional 15% for soils having a bulk-density greater than 1.7 g/cc.

Note: For soils falling in sand, loamy sand, or sandy loam classification bulk density analysis will generally not affect suitability, and analysis is not necessary.

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B. Methods of Site Evaluation

Site evaluations are required in all instances to allow proper system design and to determine compliance with the proceeding site suitability criteria prior to approving the use of on-site waste treatment and disposal systems. The responsible regulatory agency or North Coast Water Board should be notified prior to the conduct of site evaluations since verification by agency personnel maybe required. Site evaluation shall be conducted by individuals qualified as described in Section X.6 of this policy, and evaluation methods shall be in accordance with the following guidelines.

1. General Site Features

Site features to be determined by inspection shall include:

- a. Land area available for primary disposal system and replacement area.
- b. Ground slope in the effluent disposal and replacement area.
- c. Location of cut banks, fills, or evidence of past grading activities, natural bluffs, sharp changes in slope, soil landscape formations, and unstable land forms within 50 feet of the disposal and replacement area.
- d. Location of wells, intercept drains, streams, and other bodies of water on the property in question and within 100 feet on adjacent properties.

2. Soil Profiles

Soil characteristics shall be evaluated by soil profile observations. One backhoe excavation in the primary disposal field and one in the replacement area shall be required for this purpose. A third profile shall be required if the initial two profiles show conditions which are dissimilar enough so as to alter the ultimate design or location of the leachfield area.

Augered test holes shall be an acceptable alternative, upon determination of the responsible regulatory agency: (a) where use of a backhoe is impractical because of access or because of the fragile nature of the soils, (b) when necessary only to very conditions expected on the basis of prior soils investigations, or (c) when done in connection with geologic investigations. Where this method is employed, three test holes in the primary disposal field and three in the replacement area shall be required.

In the evaluation of new subdivisions, enough soil profile excavations shall be made to identify a suitable disposal and replacement area on each proposed parcel.

The following factors shall be observed and reported from ground surface to a limiting condition or five feet below the proposed leachfield system:

2. Thickness and coloring including Munsell Color Identification of soil layers, soil structure, and texture according to United States Department of Agriculture

(USDA) classification.

3. Depth to a limiting condition such as hardpan, rock strata, a large volume of rock fragments, or impermeable soil layer.
4. Depth to observed groundwater.
5. Depth to and description of soil mottling and gleying.
6. Other prominent soil features which may affect site suitability, such as structure, stoniness, consistence, root zones and pores, dampness, massive and/or weak structured soils, etc.

3. Depth to Groundwater Determinations

The anticipated highest level of groundwater shall be estimated:

- a. As the highest extent of soil mottling observed in the examination of soil profiles;
or
- b. By direct observation of groundwater levels during wet weather conditions.
Methods for groundwater determinations and monitoring well construction shall be set forth by the local regulatory agency.

Where a conflict in the above methods of examination exists, the direct observation shall govern.

In those areas which, because of parent materials, soils lack the necessary iron compounds to exhibit mottling, direct observation during wet weather conditions shall be required. Guidance in defining such areas shall be provided by the North Coast Water Board for each county within the watershed.

4. Soil Percolation Suitability

Determination of a site's suitability for percolation of effluent shall be either of the following methods:

a. Percolation Testing

Stabilized percolation rates shall be established utilizing methods specified by the local regulatory agency.

Percolation testing of soils falling within Zone 1 and Zone 2 may be conducted in non-wet weather conditions provided presoaking of the test hole is accomplished with (a) a continuous 12 hour presoaking, or (b) a minimum of four complete refillings beginning during the day prior to that of the conduct of the test.

Percolation testing of soils within Zone 3 and Zone 4 shall be conducted during wet weather conditions. However, percolation testing of soils within Zones 3 and 4 may be conducted in non-wet weather conditions provided the soils demonstrate a low shrink swell potential (Plasticity Index of less than 20, ASTM D 4318-84).

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b. Soil Analysis

Soil samples representing the significant horizons within the excavated soil profile shall be obtained and analyzed for texture and bulk density according to methods prescribed by the North Coast Water Board. The results shall be plotted on the soil textural triangle of Figure 6-7 as per indicated instructions.

- (1) Soils within Zone 1 shall be considered to have minimal filtration capabilities, requiring increased depths to groundwater as per Figure 6-6.
- (2) Soils within Zone 2 shall be considered suitable for effluent disposal without further testing.
- (3) Soils within Zone 3 and 4 shall require percolation testing as per (a) above to verify suitability for effluent disposal.

5. Wet Weather Criteria

Wet weather testing periods shall be determined geographically by local regulatory agencies incorporating the following criteria as a minimum:

- a. Between January 1 and April 30; and
- b. Following 10 inches of rain in a 30-day period or after one-half of the seasonal normal precipitation has fallen.

Modification of wet weather testing beyond the limits of the above criteria may be made in accordance with a program of groundwater level monitoring instituted and conducted by the local regulatory agency.

C. Provision for Waiver

Waiver of site suitability criteria and evaluation methods specified herein may be granted by the North Coast Water Board or county Health Officer when it can be satisfactorily demonstrated that water quality will not be impaired and public health will not be threatened as a result of such waivers.

Waivers may be granted for:

- (1) Individual cases, or
- (2) Defined geographical areas.

The local regulatory agency shall notify the North Coast Water Board of the basis for each waiver. Prior to granting geographical area waivers, the local regulatory agency shall submit technical justification to the North Coast Water Board for review and concurrence.

D. Waiver Prohibitions

Where surveys conducted by the local regulatory agencies and/or North Coast Water Board staff indicate that discharges from on-site waste treatment and disposal systems in specific geographical areas are resulting in or threatening to result in health hazards or water quality

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impairment, the North Coast Water Board may prohibit the issuance of waivers in said areas.

Exemptions to such prohibitions shall be granted by the North Coast Water Board only where an authorized public agency can provide satisfactory assurance that individual systems will be appropriately designed, located, sized, shaped, constructed, and maintained to provide adequate protection of beneficial uses of water and prevention of nuisance, pollution, and contamination.

E. Individual Systems Prohibitions

The discharge from existing or new individual systems utilizing subsurface disposal shall be prohibited by the North Coast Water Board in accordance with Section 13280 of the California Water Code where substantial evidence shows that such discharges will result in violation of water quality objectives, will impair present or future beneficial uses of water, will cause pollution, nuisance, or contamination, or will unreasonably degrade the quality of any waters of the state. Identification of "individual systems prohibition areas" is incorporated into Section VIII of this policy.

6.4.4.4 Design Criteria and Technical Guidelines

A. Estimates of Wastewater Flows for Design Purposes

Although actual wastewater flows may in fact be less, estimates of wastewater flows for the design of conventional on-site systems shall be based on 150 gallons per day per bedroom. Local regulatory agencies may incorporate reduced flows into the design of the on-site system upon approval by the North Coast Water Board or for alternative systems. Estimated flow rates for on-site systems receiving wastewater flows of greater than 1,500 gallons per day or from commercial establishments shall take into account peak loading rates and the chemical characteristics of the wastewater.

B. Septic Tank Capacity, Construction, Inspection, and Testing

At a minimum, septic tank capacity, construction, inspection, and testing requirements shall be based upon the current edition of the International Association of Plumbing and Mechanical Officials Uniform Plumbing Code (1988 Edition), or other local agency regulations approved by the North Coast Water Board.

Individual treatment units other than septic tanks shall require certification by the National Sanitation Foundation (NSF) or the International Association of Plumbing and Mechanical Officials (IAPMO) prior to approval for use.

C. Leachfield System Design

The design of the leachfield shall be based on both the estimated flows set forth in Section IV.A. of this policy, and the organic loading of the on-site system. Table 6-27 or other local

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regulatory agency regulations approved by the North Coast Water Board shall be acceptable for conventional on-site systems.

Utilization of the upper horizons for wastewater disposal shall be encouraged. Sidewall depth below the bottom of the leaching pipe shall be a minimum of 12 inches and shall not exceed 36 inches. The use of trenches deeper than 36 inches below the bottom of the leaching pipe shall be acceptable only where site investigations and plans by a qualified individual (per Section X.6. of this policy) demonstrate the suitability of the system to accept wastewater and protect quality.

Trench width shall not exceed 36 inches. Plastic leaching chambers are acceptable, provided the size is based on Table 6-28 of this policy.

D. Cesspools

The use of cesspools for on-site waste treatment and disposal shall be prohibited.

E. Holding Tanks

The use of holding tanks shall be prohibited except where the responsible regulatory agency determines that:

1. It is necessary to abate an existing nuisance or health hazard; or
2. The proposed use is within a sewer service area, sewers are under construction or contracts have been awarded and completion is expected within two years, there is capacity at the wastewater treatment plant and the sewerage agency will assume responsibility for maintenance of the tanks; or
3. It is for use at a campground or similar temporary public facility where a permanent sewage disposal system is not necessary or feasible and maintenance is performed by a public agency.

F. Intercept Drains

The use of intercept drains to lower the level of perched groundwater in the immediate leachfield area shall be acceptable under the following conditions:

1. Natural ground slope is greater than 5 percent;
2. Site investigations show groundwater to be perched on bedrock, hardpan, or an impermeable soil layer;
3. The intercept drain extends from ground surface into bedrock, hardpan, or the impermeable soil layer.

In no case shall the pervious section of an intercept drain be located less than 15 feet upgradient or 50 feet laterally from any leachfield.

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Where all of the above conditions cannot be met, actual performance of the intercept drain shall be demonstrated prior to approval.

Table 6-28: Rates of Wastewater Application for Absorption Areas

Soil Texture	Percolation Rate Minutes per Inch	Application Rate Gallons per Day per Square Foot
<u>Gravel, coarse sand</u>	<u>≤1</u>	<u>Not Suitable</u>
<u>Coarse to medium sand</u>	<u>1 – 5</u>	<u>1.2</u>
<u>Fine sand, loamy sand</u>	<u>6 – 15</u>	<u>1.1 – 0.8</u>
<u>Sandy loam, loam</u>	<u>16 – 30</u>	<u>0.7 – 0.6</u>
<u>Loam, porous silt loam</u>	<u>31 – 60</u>	<u>0.5 – 0.4</u>
<u>Silty clay loam, clay loam – a,b</u>	<u>61 – 120</u>	<u>0.4 – 0.2</u>

Note: Application rates may be interpolated based on percolation rates, within the ranges listed above.

- a. Soils without expandable clays.
- b. These soils may be easily damaged during construction.

G. Fills

The use of fills to create a leachfield cover shall be acceptable under the following conditions:

1. Where the natural soils and the fill material meet the evaluation criteria as described in Section III of this policy;
2. Where the quantity and method of fill application is described;
3. Where the natural slope does not exceed 20 percent;
4. Where placement of fill will not aggravate slope stability or significantly alter drainage patterns or natural watercourses.

Leachlines for wastewater disposal shall be placed entirely within natural soils. Fill material shall not be used to create a basal area for alternative systems or mounds.

Local agencies shall provide specific criteria for the use of fill material which are compatible with the provisions of this policy.

H. Water Saving Devices

The use of water-saving devices may be incorporated into the on-site system design where maintenance of such devices is provided by a responsible entity.

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North Coast Water Board waste discharge regulation of on-site disposal systems may specify the use of water conservation.

I. Alternative Systems

An alternative system may be appropriate where physical site constraints preclude the installation of a standard septic tank leachfield on-site wastewater disposal system. Alternative systems shall be subject to a program of monitoring provided by a legally responsible entity.

1. Mound Systems

Mound systems utilize reduced criteria for soil permeability and depth to groundwater on slopes up to 12%. Percolation rates of up to 120 minutes per inch are allowed. A minimum of 24 inches of separation between groundwater and native ground surface is required. The mound design shall be based on the Design and Construction Manual for Wisconsin Mounds, Small Scale Wastewater Management Project, University of Wisconsin (January 1990).

2. Pressure Distribution Systems

Pressure distribution systems enable wastewater disposal in conditions of shallow topsoil over slowly permeable or fractured subsoils on slopes up to 30%. Percolation rates of 1 to 120 minutes per inch are required. The system shall have a minimum depth to groundwater, fractured or consolidated rock, or impermeable soils of 24 inches beneath trench bottom. The design shall comply with criteria set forth by the local regulatory agency.

3. At-Grade Systems

At-Grade Systems enable wastewater disposal in conditions of shallow topsoils on slopes up to 25%. Percolation rates of up to 120 minutes per inch are allowed. A minimum of 36 inches of separation between groundwater and native ground surface is required. The design shall be based on the Wisconsin At-Grade Soil Absorption System Siting, Design and Construction Manual, Small Scale Wastewater Management Project, University of Wisconsin (January 1990).

4. Sand Filters

Sand filters may be used to pretreat the effluent from a septic tank by application to a bed of specified media. Maintenance is required to assure the long-term effectiveness of sand filters.

Proposals for alternative systems other than those listed above shall be evaluated jointly by the local regulatory agency and the North Coast Water Board staff on a case by case basis.

J. Cumulative Effects

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The potential cumulative effects on ground and surface waters include, but are not limited to, groundwater mounding and nitrate loading. The local regulatory agency and the North Coast Water Board shall determine the need for cumulative impact assessment for on-site systems, and will consider in particular, subdivision developments, commercial establishments, and on-site systems receiving greater than 1,500 gallons per day. For most on-site systems, the assessment of cumulative effects is not necessary.

Analysis of cumulative impact effects shall be conducted using accepted principles of groundwater hydraulics, shall describe the specific methodology, and shall include literature references as appropriate. The wastewater flow used for cumulative impact analysis shall normally be as follows: 100 gallons per day per bedroom for individual residential system; design sewage flow for multi-family and other non-residential systems.

a. Groundwater Mounding Analysis

Groundwater mounding analysis shall be used to predict the highest rise of the water table and shall account for background groundwater conditions during the wet weather season. The maximum acceptable rise of the water table for short periods of time during the wet weather season, as estimated from groundwater mounding analysis, shall be as follows:

For systems with design flows of less than 1,500 gallons per day, groundwater mounding beneath the disposal field shall not result in more than a 50 percent reduction in the minimum depth to seasonally high groundwater as specified in this policy.

For systems with design flows of 1,500 gallons per day or more, a minimum groundwater clearance of 24 inches shall be maintained beneath the system.

b. Nitrate Loading

Analysis of nitrate loading effects shall be based, at a minimum, on an estimate of an annual chemical-water mass balance.

Minimum values used for the total nitrogen concentration of septic tank effluent shall be: 40 mg/l as N (for average flow conditions) for residential wastewater, or as determined from sampling of comparable system(s) or from literature values.

On-site systems shall not cause the groundwater nitrate concentration to exceed 10.0 mg/l as N at any source of drinking water on the property nor on any off-site potential drinking water source.

K. Septage Disposal

Septage disposal shall comply, as a minimum, with the California Code of Regulations, Title 23, Division 3, Chapter 15 and with federal regulations as described in 40 CFR Part 503.

6.4.4.5 Maintenance Responsibilities

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Maintenance, monitoring, and repair of individual waste treatment and disposal systems shall be the responsibility of:

1. The individual property owner; or
2. A legally responsible entity of dischargers empowered to carry out such functions. That legally responsible entity shall be a public agency, unless demonstration is made to the North Coast Water Board that an existing public agency is unavailable and formation of a new public agency is unreasonable. If such a demonstration is made, a private entity must be established with adequate financial, legal, and institutional resources to assume responsibility for waste discharge.

For subdivision developments where waste discharge requirements are prescribed by the North Coast Water Board, the existence or formation of a legally responsible entity of dischargers shall be required.

6.4.4.6 Abatement

Abatement of failing individual waste treatment and disposal systems shall be obtained in accordance with local agency codes and procedures. When such remedies are ineffective and for systems subject to waste discharge requirements, abatement shall be obtained through North Coast Water Board enforcement action.

Abatement of failing systems shall include short-term mitigation and permanent corrective measures. At a minimum, short-term mitigation shall include reduction of effluent flows and the posting of areas subject to the surfacing of inadequately treated sewage effluent.

6.4.4.7 Waiver Prohibition Areas

There are no waiver prohibition areas identified in the Russian River Watershed, including the Laguna de Santa Rosa.

6.4.4.8 Individual System Prohibitions

In order to achieve water quality objectives, protect present and future beneficial water uses, protect public health and prevent nuisance, discharge of waste from new individual disposal systems may be prohibited forthwith and discharge of waste from existing individual disposal systems may be prohibited in defined areas.

The North Coast Water Board may grant an exemption to the prohibition for:

1. New individual disposal systems after presentation of geologic and hydrologic evidence by the proposed discharger that such systems will not individually or collectively result in a pollution or a nuisance; and
2. Existing individual disposal systems if it finds that the continued operation of such systems in a particular area will not individually or collectively directly or indirectly affect water quality adversely.

6.4.4.9 Education and Training

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Informational bulletins concerning construction, use, maintenance, and repair of individual waste treatment and disposal system shall be made available for public education by local regulatory agencies.

Professional training concerning site evaluations and new alternative systems design concepts for subsurface effluent disposal shall be promoted periodically by North Coast Water Board staff in cooperation with local regulatory agencies and public and private sector professional associations.

6.4.4.10 Implementation

1. Local agencies, shall, as necessary, revise existing sewage disposal ordinances to be compatible with the provisions of this policy. The North Coast Water Board shall be notified by local agencies of the revisions.
2. Local agencies shall submit for North Coast Water Board approval a report describing:
 - a. The current program and methods for disposing of septic tank pumpage; and
 - b. Plans for meeting future septage disposal needs.
3. Proposals for on-site waste treatment and disposal systems shall be processed as follows:
 - a. Processed entirely by the local regulatory agency:
 - i. Systems to serve a single dwelling unit within a recorded land development;
 - ii. Systems for less than 1,500 gpd domestic waste flows from commercial/industrial establishments;
 - iii. Land developments consisting of four or fewer parcels;
 - iv. Dwellings involving four or fewer family units.The North Coast Water Board shall be notified of waivers granted for any of the above.
 - b. Reviewed by the North Coast Water Board for possible establishment of waste discharge requirements:
 - i. Land developments consisting of five or more parcels;
 - ii. Dwellings involving five or more family units;
 - iii. Systems for commercial/industrial establishments with domestic waste flows equal to or greater than 1,500 gpd.
 - iv. All systems proposed for new construction or repairs on federal lands.
 - c. The North Coast Water Board shall retain jurisdiction over any individual waste treatment and disposal systems which may in its judgment result in water pollution,

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nuisance and/or health hazards.

4. The North Coast Water Board and local regulatory agency shall develop and maintain working agreements concerning procedures and guidelines to be followed in the issuance of waivers as provided by this policy.
5. The North Coast Water Board shall, as necessary, request of each local regulatory agency in the watershed, an identification of geographical areas that may qualify for establishment of:
 - a. On-site wastewater management district,
 - b. Waiver prohibition areas, or
 - c. Individual system prohibitions.

Designation of such areas by the North Coast Water Board shall be made formal by incorporation into this policy.

6. Site evaluations in accordance with this policy shall be performed by individuals who by virtue of their education, training, and experience, are qualified to examine and assess soil, geologic, and hydrologic properties as related to subsurface effluent disposal. Credentials required of such individuals shall be specified by local regulatory agencies and shall include, as a minimum, education, training, and experience as geologist, soil scientist, registered civil engineer, or registered environmental health specialist.
7. Laboratory analysis of soils shall be conducted at commercial soils testing laboratories, or at other firms or establishments which can demonstrate to the satisfaction of the North Coast Water Board the necessary equipment and personnel capabilities for performing the required tests. Procedures for laboratory analysis shall be provided by the North Coast Water Board. Examination of soil testing capabilities shall be conducted by the North Coast Water Board according to the demand.
8. Alternative systems shall be evaluated as follows:
 - a. The North Coast Water Board shall, as necessary, prepare a written report which summarizes the progress and findings of the alternative systems within the watershed.
 - b. The local regulatory agency shall prepare a written report following the construction season which describes the number of alternative systems permitted and the operational status of the alternative systems within its jurisdiction.
 - c. The North Coast Water Board shall prepare annually a report which summarizes the status of mound systems within the watershed.
 - d. The North Coast Water Board shall maintain a literature and information file which pertains to alternative systems.

9. The North Coast Water Board shall maintain a literature and information file which pertains to water conservation.
10. The local regulatory agencies shall establish, as necessary, a time schedule for compliance of seepage disposal sites to be compatible with the provisions of this policy.

6.4.4.11 Definitions

The following definitions apply to this policy.

Alternative System. Any individual system that does not include a standard septic tank or an NSF or IAPMO certified device for treatment, or does not include standard leaching trenches for effluent disposal, which has been demonstrated to function in such a manner as to protect water quality and preclude health hazards and nuisance conditions.

Bedrock. Solid rock, which may have fractures, that lies beneath soils and other unconsolidated material. Bedrock may be exposed at the surface or have an overburden several hundred feet thick.

Bulk Density. The mass of dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight of 105°.

Coarse Fragments. Rock or mineral particles greater than 2.0 mm in diameter.

Conventional On-Site Waste Treatment and Disposal System. Any system using a standard septic tank for treatment and standard leaching trenches or seepage pit for effluent disposal.

Cumulative Effects. The persistent and/or increasing effect of individual waste treatment and disposal systems resulting from the density of such discharges in relation to the assimilative capacity of the ground environment. Examples include salt or nitrate additions to groundwater, nutrient enrichment of surface water, and hydraulic interference with groundwater and between adjacent systems.

Cut Bank. A man-made excavation of the natural terrain in excess of three feet.

Dual Leachfield System. An effluent disposal system consisting of two complete standard leachfields connected by an accessible diversion valve and intended for alternating use on an annual or semiannual basis.

Entity of Dischargers. A public agency, or a party which can demonstrate to the North Coast Water Board comparable, legal and financial authority and responsibility, for the purpose of monitoring, inspecting, and maintaining individual waste treatment and disposal systems.

Ephemeral Stream. Any observable watercourse that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source. Its stream channel is at all times above the local water table.

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Any watercourse that does not meet this definition is to be considered a perennial stream for the purposes of this policy.

Failure. The ineffective treatment and disposal of waste resulting in the surfacing of sewage effluent and/or the degradation of ground and surface water quality.

Greywater. Untreated household wastewater which has not come into contact with toilet waste. Greywater includes used water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines, and laundry tubs. It does not include wastewater from kitchen sinks, dishwaters or laundry water from soiled diapers.

Groundwater. Any subsurface body of water which is beneficially used or is usable. It includes perched water if such water is used or usable, or is hydraulically continuous with used or usable water.

Hardpan. An irreversibly hardened soil layer caused by the cementation of soil particles. The cementing agent may be silica, calcium carbonate, iron, or organic matter.

Impermeable Soil Layer. Any layer of soil having a percolation rate slower than 120 MPI or a Zone 4 Soil Texture according to Figure 6-7 of this policy which has a high shrink swell potential (Plasticity Index of greater than 20, ASTM D 4318-84).

Incompatible Use. Any activity or land uses that would preclude or damage an area for future use as an effluent disposal site. Includes the construction of buildings, roads or other permanent structures and activities that may result in the permanent compaction or removal of existing soil.

Intercept Drain: A drain, installed to intercept the lateral movement of groundwater and discharge it to a suitable area. Often referred to as a curtain drain.

Limiting Soil Layer. The portion of the soil profile that because of percolation characteristics, most restricts the successful operation of a leachfield.

Local Regulatory Agency. Any agency having authority as provided by county or city ordinances to control approval, installation, and use of individual waste treatment and disposal systems. May include county/city health department, building departments, or department of public works.

Mottles. Irregular spots of different colors that vary in number and size. The redoximorphic features of soils (mottling and gleying) are used to indicate poor aeration and lack of drainage.

On-Site Wastewater Disposal Zone. An area designated for operation and maintenance of individual waste treatment and disposal systems by a public agency entrusted with powers in accordance with the provisions of Chapter 3, Part 2, Division 6, of the State Health and Safety Code.

Perched Water. A subsurface body of water separated from the main groundwater body of a relatively impermeable stratum above the main groundwater body.

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Perennial Stream. Any stretch of a stream that can be expected to flow continuously or seasonally. They are generally fed in part by springs.

Saturated Soil. The condition of soil when all available pore space is occupied by water and the soil is unable to accept additional moisture. In fine textured soils a free water surface may not be apparent. The extent of saturated soil conditions and anticipated level of high groundwater can be estimated by the extent of soil mottling.

Soil. The unconsolidated material on the surface of the earth that exhibits properties and characteristics that are a product of the combined factors of parent material, climate, living organisms, topography, and time.

Soil Depth. The combined thickness of adjacent soil layers that are suitable for effluent filtration. Soil depth is measured vertically to bedrock, hardpan, impermeable soil layer, or saturated soil.

Soil Horizon or Layer. A layer of soil approximately parallel to the land surface and differing from adjacent (underlying or overlying) layers in some property or characteristic. Differences include, but are not limited to, color, texture, pH, structure, and porosity.

Soil Texture (United States Department of Agriculture (USDA)). The relative amounts of sand, silt, and clay as defined by the classes of the soil textural triangle. Textural classes may be modified when coarse fragments are present in sufficient number, i.e., gravelly sandy loam, cobbled clay, etc.

Standard Leaching Trenches. Leaching trenches designed in accordance standard practice in local agency regulations.

Unstable Landform. An area which shows evidence of mass downslope movement such as debris flow, landslides, rockfills, and hummocky hillslopes with undrained depressions upslope. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside; landslide scars and curving debris ridges; fences, trees, and telephone poles which appear tilted; or tree trunks which bend uniformly as they enter the ground. Active sand dunes are unstable land forms.

7. SURVEILLANCE AND MONITORING

7.1 Statewide Monitoring Programs

The effectiveness of a water quality control plan cannot be judged without the information supplied by a strong and systematic surveillance and monitoring program. The overall objectives of an adequate water quality surveillance and monitoring program are:

1. To measure achievement of the plan's water quality objectives.
2. To measure effects of water quality changes on beneficial uses.
3. To measure water quality background conditions and long-term trends.
4. To locate and identify sources of water pollution that pose a threat to the environment.
5. To help relate receiving water quality to mass emissions of pollutants by waste dischargers.
6. To provide data for determining waste discharger compliance with permit conditions.
7. To measure waste loads discharged to a receiving water body and identify the limits of their effect as a necessary step in the development of waste load allocations.
8. To provide documentation to support enforcement of permit conditions required of waste dischargers.
9. To provide data needed to carry on the continuing planning process.
10. To measure the effects of water rights decisions on water quality to guide the State Water Board in its responsibility to regulate unappropriated water for the control of quality.
11. To provide a clearinghouse for water quality data gathered by other agencies and private parties cooperating in the program.
12. To report on water quality conditions as required by federal and state regulations or requested by others.

7.1.1 CALIFORNIA WATER QUALITY MONITORING COUNCIL

The California Water Quality Monitoring Council (Monitoring Council) develops specific recommendations to improve the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment, enhance the integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data

and assessment information. While the Monitoring Council may recommend new monitoring or management initiatives, it will build on existing efforts to the greatest extent possible. The Monitoring Council published its initial recommendations in December 2008, and its recommendations for A Comprehensive Monitoring Program Strategy for California in December 2010.

On July 1, 2020, the Monitoring Council approved a Strategic Plan to help visualize and describe the overall vision and mission of the Monitoring Council and its Workgroups. More information about the Monitoring Council, its products and resources, and the current list of Monitoring Council Workgroups can be found at the [California Monitoring Council website](https://mywaterquality.ca.gov/monitoring_council/index2.html) (https://mywaterquality.ca.gov/monitoring_council/index2.html).

7.1.2 Groundwater Ambient Monitoring and Assessment

The Groundwater Ambient Monitoring and Assessment (GAMA) Program is California's comprehensive groundwater quality monitoring program that was created by the State Water Board in 2000. It was later expanded by Assembly Bill 599 - the Groundwater Quality Monitoring Act of 2001. AB 599 required the State Water Board, in coordination with an Interagency Task Force and Public Advisory Committee, to improve statewide comprehensive groundwater monitoring and increase the availability of groundwater quality information to the public. The GAMA Program is based on interagency collaboration with the State and Regional Water Boards, Department of Water Resources, Department of Pesticide Regulations, U.S. Geological Survey, and Lawrence Livermore National Laboratory, California public universities, and cooperation with local water agencies and well owners.

California is very reliant on groundwater supplies. Nine out of ten public water systems rely on groundwater for at least a portion of their supply. Over 36 million California residents get their water from a safe to drink public source, while nearly 2 million are served either by a private domestic well or smaller water systems (less than 15 service connections). Private domestic well owners are encouraged to test their well water quality regularly.

7.1.3 Surface Water Ambient Monitoring Program

The Surface Water Ambient Monitoring Program (SWAMP) mission is to provide resource managers, decision makers, and the public with timely, high-quality information to evaluate the condition of all waters throughout California. SWAMP accomplishes this through carefully designed, externally reviewed monitoring programs, and by assisting other entities statewide in the generation of comparable data that can be brought together in integrated assessments that provide answers to current management questions.

Bioassessment

Biological assessment (bioassessment) is an evaluation of the condition of a waterbody based on the organisms living within it. It involves surveying the types and numbers of organisms present in the water and comparing the results to established benchmarks of biological health. Scientists and managers around the world use this approach to directly and quantitatively measure the ecological health of a waterbody and to monitor the cumulative impacts of environmental stressors on surface waters.

Benthic macroinvertebrates (BMIs) and benthic algae are the primary biota used for bioassessments in California. BMIs are a diverse group of small but visible animals that live at the bottom of rivers and streams. They are composed mostly of aquatic insects but also include crustaceans, mollusks, and worms. BMI assemblages are found in most waterbodies and are reliable indicators of biological health because they are relatively stationary and respond predictably to a variety of environmental stressors. Benthic algae are also sensitive to environmental stressors and provide environmental condition information that is often complementary to that derived from BMI assemblages. Because of their short lifespans and rapid reproduction rate, algae can respond quickly to changing water conditions. They are also more directly responsive to nutrients (such as nitrogen and phosphorus) and are therefore suited for monitoring nutrient runoff, one of the major environmental stressors in California.

SWAMP began conducting bioassessment in 2000. The program continues to work closely with the California Department of Fish and Wildlife's Aquatic Bioassessment Laboratory, which has been the primary producer of this technical work. Other major partners include the Southern California Coastal Water Research Project and the California State University experts at Chico and San Marcos.

Freshwater and Estuarine Harmful Algal Bloom (FHAB) Program

Harmful algal blooms occur in lakes, reservoirs, rivers, and estuaries throughout the state and during all months of the year. Toxin-producing cyanobacteria that comprise blooms can occur in high elevation lakes in the Sierra Nevada mountains, in sensitive desert landscapes where water is already a scarce resource, and in coastal estuaries where cyanotoxins can be exported to the marine environment. In parts of the state, environmental conditions such as drought promote cyanobacterial bloom that persist through the winter, making harmful algal blooms a year-round issue in California. When cyanobacterial blooms produce cyanotoxins, they threaten drinking water supplies, wildlife, domestic animals, and human health. With greater than 3,000 lakes, 190,000 river miles, variable rainfall and ecoregions, and over 40 million residents, harmful algal blooms have become a complex social and ecological issue in California.

The State and Regional Water Boards along with other concerned entities first began to address harmful algal blooms in 2006 with the formation of the Blue Green Algae Workgroup, which later became the California Cyanobacteria Harmful Algal Bloom (CCHAB) Network. An initial product of this group was the Voluntary Guidance Document that describes a standardized framework to HAB response in recreational waterbodies (original release 2010, updated 2016). In 2019, Assembly Bill (AB) 834 added a new section to the Water Code and directed the Water Boards to create a formal program. The FHAB Program at the State and Regional Boards are tasked with fulfilling requirements of Section 13182 of the Water Code, including consultation among state agencies, coordinating incident response, conducting ambient monitoring, assessing risk, developing research and tools, and providing education and outreach.

Bioaccumulation Monitoring Program

The Safe to Eat Workgroup (STEW Workgroup), formerly known as the Bioaccumulation Oversight Group is a subcommittee of the Water Boards' SWAMP Roundtable that

provides oversight of SWAMP's statewide Bioaccumulation Monitoring Program. The mission of the STEW Workgroup is to assess the impacts of contaminants in fish and shellfish on beneficial uses in California water bodies through statewide monitoring under SWAMP and perform syntheses of information from these statewide monitoring efforts and other studies.

The STEW Workgroup is also a workgroup of the California Water Quality Monitoring Council, and in this role manages the Safe to Eat Portal and is a forum for coordination of bioaccumulation monitoring in California. Please see the STEW Charter for more information.

SPoT - Stream Pollution Trends Monitoring Program

The Stream Pollution Trends (SPoT) Monitoring Program was initiated in 2008 with three primary goals:

- Determine long-term, statewide trends in stream contaminant concentrations and effects;
- Relate key water quality indicators to land-use characteristics and management efforts; and
- Establish a network of sites throughout the state to serve as a backbone for collaboration with local, regional, and federal monitoring programs and management agencies.

The SPoT Monitoring Program conducts statewide monitoring to provide information on the condition of California waterways with respect to trends in sediment toxicity and contamination. SPoT data are currently used by the State and Regional Water Boards to assess the levels to which aquatic life beneficial uses are supported in California streams and rivers.

The SPoT Monitoring Program also analyzes sediment samples deposited at the base of watersheds for metals, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, legacy pesticides, current use pesticides, and emerging contaminants such as fipronil and polybrominated diphenyl ethers. In addition, toxicity is analyzed using the amphipod *Hyalella azteca* and the midge *Chironomus dilutus*, and categorized using a flow chart.

Data collected by the SPoT program are stored in the California Environmental Data Exchange Network (CEDEN). Water quality, toxicity, and habitat data can be queried by selecting "SWAMP Stream Pollution Trends" from the "Select Parent Projects" filter.

California Environmental Data Exchange Network

The California Environmental Data Exchange Network (CEDEN) is the State Water Board's data system for surface water quality in California. CEDEN is a central location to find and share information about California's waterbodies, including streams, lakes, rivers, and the coastal ocean. Many groups in California monitor water quality, aquatic habitat, and wildlife health to ensure good stewardship of ecological resources. CEDEN works with three regional CEDEN data centers to include all available statewide data, such as that produced by SWAMP monitoring projects as well as by research and

volunteer organizations. Anyone can access CEDEN data online or submit new data. Visit [the CEDEN website](https://ceden.org/index.shtml) (<https://ceden.org/index.shtml>) for more information.

QA/QC - Quality Assurance and Quality Control

In response to federal requirements, the State Water Board's Surface Water Ambient Monitoring Program (SWAMP) has developed a Quality Assurance Program to ensure that data generated from environmental measurement studies are technically sound and legally defensible. The SWAMP Quality Assurance Program Plan (QAPrP) summarizes procedures to be followed by the State Water Board and Regional Water Boards in administering state and federally funded programs that involve measurement of environmental parameters. The QAPrP applies to special water quality studies involving surface, ground, or marine waters.

Dischargers must use laboratories certified by the State Water Board's Environmental Laboratory Accreditation Program. The Regional Water Board's contract laboratories have approved quality assurance/quality control programs, and North Coast Water Board staff follow a standard chain of custody process in the collection, transport, and handling of samples.

The methods employed for sample collection, handling, preservation, transport, analysis, and results reporting must be such that the results of the analyzed sample accurately represent the conditions in the sampled water body. Federal regulations require the establishment of criteria and standard methods to assure that quality is maintained throughout the work from sample collection to reporting of the results.

Briefly, these regulations require that (a) physical and professional capabilities be adequate to perform the analysis for all parameters in the sampling plan; (b) sample collection, handling, and preservation be conducted according to U.S. EPA manuals; (c) time-sensitive samples be transported and analyzed within specific holding times; (d) sample integrity be provided for a legal chain of custody of samples collected for support of enforcement actions; (e) analytical methods be in accordance with standardized methods; and (f) analytical quality control procedures be established for intra-laboratory checking of reference samples. Laboratory records including reference sample results, are to be available for U.S. EPA review.

A key component of the Surface Water Ambient Monitoring Program (SWAMP) is the development, implementation, and maintenance of the monitoring infrastructure (e.g., indicators, methods, quality assurance/quality control [QA/QC], and data management) necessary to support a robust monitoring program while also fostering data comparability and collaboration with monitoring partners.

Quality assurance (QA) is an integrated system of management activities (i.e., planning, implementation, assessment, reporting, and quality improvement) that focuses on providing confidence in the data or product by ensuring that it is of the type and quality needed and expected by the client. The key components of the SWAMP QA program are: the Quality Assurance Program Plan (QAPrP), QA Project Plans (QAPPs), and other QA Resources (including QA training, a Help Desk and the SWAMP QA team).

7.1.4 Water Quality Inventory

The 305(b) Report, also known as the National Water Quality Inventory Report, is a summary of all states' water quality reports compiled by the U.S. Environmental Protection Agency. The report is prepared biennially from information the states are required to submit pursuant to Section 305(b)(1) of the Clean Water Act.

The state 305(b) Report includes: (a) a description of the water quality of major navigable waters in the state during the preceding years; (b) an analysis of the extent to which significant navigable waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water; (c) an analysis of the extent to which elimination of the discharge of pollutants has been achieved; and (d) an estimate of the environmental impact, the economic and social costs necessary to achieve the "no pollutant discharge" objective of the Clean Water Act, the economic and social benefits of such achievement, and the date of such achievement; and (e) a description of the nature and extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

7.2 Regional Monitoring Programs

7.2.1 Surface Water Monitoring

The North Coast Region SWAMP program provides resources to investigate and evaluate the water quality conditions throughout the region. This includes analyses for physical, chemical, and biological parameters such as minerals, heavy metals, turbidity, coliform bacteria, phytoplankton, zooplankton, and cyanobacteria. The results of the sampling provides the basis for data summaries and baseline information used in the development of permits and waivers, Total Maximum Daily Load (TMDLs), implementation policies and action plans, , as well as research and water quality investigations to document degraded waterbodies or those of high water quality.

7.2.2 Discharger Self-Monitoring

All self-monitoring information generated from National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements is collected and screened for overall assessment of operations and instances of compliance and noncompliance. Self-monitoring reports are submitted by the discharger as required by the permit conditions.

7.2.3 Compliance Monitoring

Compliance monitoring is carried out by the North Coast Water Board staff to check the discharger self-monitoring work and to provide data for enforcement actions. Its scope depends on the number and complexity of waste discharge requirements (NPDES and other permits) issued by the North Coast Water Board. Waste discharge requirements may or may not include specific discharger self-monitoring and reporting requirements. Each discharger is periodically visited by North Coast Water Board personnel on both announced and unannounced facility inspections. Facility inspections may include personal contact and communication with the dischargers to review their procedures in

order to assure quality control, a survey of the operation, inspection of the waste facilities and discharge area, and collection of samples.

7.2.4 Complaint Investigations

Complaint investigations are carried out by North Coast Water Board staff in response to complaints of citizens and public or governmental agencies regarding the discharge of pollutants or creation of nuisance conditions. North Coast Water Board responsibilities may include field and telephone investigations, documentation of observed conditions (reports, letters, photographs), and enforcement actions as appropriate.

7.2.5 Special Studies/Intensive Surveys

Special studies and intensive surveys are usually performed to obtain detailed information about a specific water quality problem. They usually involve localized, intermittent sampling at a higher than normal frequency. Special situations requiring intensive monitoring range from studies of industrial discharges to watershed-wide inventories to characterize water quality conditions. Special studies and intensive surveys are conducted on an as-needed basis and often involve coordination with other regulatory and governmental agencies.

7.2.6 Aerial Surveillance

Aerial surveillance is used primarily to gather photographic records of discharges and water quality conditions. Aerial surveillance is particularly effective because of the overall view of a watershed or facility that is obtained and because many facilities can be observed in a short period of time.

7.2.7 Water Quality Models

Water quality models are useful tools to:

- provide a framework for organizing knowledge about a water body;
- reveal gaps in the knowledge and data on a water body;
- formulate baseline and trend monitoring programs;
- simulate water quality changes in response to point and nonpoint discharges to receiving waters; and
- assess potential conformance to proposed and existing water quality objectives.

7.2.8 Groundwater Monitoring

North Coast Water Board staff investigate the quality of groundwater in response to complaints, as a part of the Well Investigation Program, and through other specifically-funded groundwater quality investigations.

Most of the groundwater investigations in the region are performed by dischargers, by order of the North Coast Water Board. This type of discharger-funded groundwater investigation falls within discharger self-monitoring addressed earlier in this section.

Groundwater has been impaired at various locations regionwide particularly as a result of agricultural, industrial, and commercial chemical handling, storage, and disposal practices. Particular problems are known to exist in several groundwater basins within the region,

including the Santa Rosa Plains, Smith River Plain, and Eureka Plain. Monitoring contract funds have been requested in recent years for the acquisition of data with which to more effectively understand and address the impairment of these and other groundwater basins. Very little funding has been available for this purpose, and data is suggestive of more extensive problems. Further groundwater data will continue to be sought for the North Coast Region through all avenues to address problems resulting from contamination by pesticides, nitrates, solvents, fuel, and other chemicals.

7.2.9 Nonpoint Source Investigations

Nonpoint source investigations are conducted on an as-needed basis and as funding allows. Typical sources of funding include Clean Water Act 205(j), 208, and 319(h) funds. The objectives of nonpoint source investigations are to identify the location(s) of the nonpoint source pollutant sources; develop information on the quantity, strength, character and variability of nonpoint source pollutants; evaluate the impact on receiving water quality and biota; provide information useful in management of nonpoint source pollutants; and to monitor the results of any control plan. Investigations are typically undertaken on a statewide priority basis. Self-monitoring reports may be submitted by the discharger as required by the permit conditions.