



# APPENDIX C: WATER RESOURCES



## BENEFICIAL USES OF THE LAGUNA

This table lists the “beneficial uses” of the Laguna de Santa Rosa sub-basin, as defined by the North Coast Regional Water Quality Control Board, as of the year 1996. Note that the portion of the watershed covered by this table does not correspond one-to-one with the working definition of the Laguna watershed used throughout this report. This sub-basin includes only the waters south of the confluence of the Laguna de Santa Rosa and Santa Rosa Creek (which is situated just south of the Guerneville Road Bridge.) The working definition of the Laguna watershed, used elsewhere in this report, is much larger than this and includes all of Santa Rosa, Mark West, and Windsor Creeks up to the confluence with the Russian River.

Table II: Beneficial Uses of the Laguna de Santa Rosa hydrologic unit. 1996.

Symbol	Protected Beneficial Use	E = existing P = potential	Description
MUN	Municipal and Domestic Supply	P	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
AGR	Agricultural Supply	E	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
IND	Industrial Service Supply	E	Uses of water for farming, horticulture, or ranching including but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
PRO	Industrial Process Supply	E	Uses of water for industrial activities that depend primarily on water quality.



Table II: Beneficial Uses of the Laguna de Santa Rosa hydrologic unit. 1996.

Symbol	Protected Beneficial Use	E = existing P = potential	Description
GWR	Groundwater Recharge	E	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.
FRSH	Freshwater Replenishment	E	Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
NAV	Navigation	E	Uses of water for shipping, travel, or other transportation by private, military or commercial vessels
POW	Hydropower Generation	E	Uses of water for hydropower generation.
REC-1	Water Contact Recreation	E	Uses of water for recreational activities involving body contact with the water, where ingestion of the water is reasonably possible. These include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white-water activities, fishing, or use as a natural hot springs.
REC-2	Non-Contact Water Recreation	E	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.
COMM	Commercial and Sport Fishing	E	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.
AQUA	Aquaculture	P	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.



Table 11: Beneficial Uses of the Laguna de Santa Rosa hydrologic unit. 1996.

Symbol	Protected Beneficial Use	E = existing P = potential	Description
WARM	Warm Freshwater Habitat	E	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.
COLD	Cold Freshwater Habitat	E	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.
WILD	Wildlife Habitat	E	Uses of water that support terrestrial ecosystems including, but not limited to, preservation or enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
RARE	Rare, Threatened, or Endangered Species	E	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.
MIGR	Migration of Aquatic Organisms	E	Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.
SPWN	Spawning, Reproduction, and/or Early Development	E	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
SHELL	Shellfish Harvesting	P	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.



Table II: Beneficial Uses of the Laguna de Santa Rosa hydrologic unit. 1996.			
Symbol	Protected Beneficial Use	E = existing P = potential	Description
<i>ADDITIONAL BENEFICIAL USES FOR THE SANTA ROSA CREEK HYDROLOGIC UNIT</i>			
CUL	Native American culture	E	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.
FISH	Subsistence fishing	E	Uses of water that support subsistence fishing.
POW	Hydropower generation	P	Uses of water for hydropower generation.
<i>ADDITIONAL BENEFICIAL USE OF LAGUNA WETLANDS</i>			
WET	Wetland Habitat	E	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.
FLD	Flood Peak Attenuation/Flood Water Storage	P	Uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.
WQE	Water Quality Enhancement	E	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.



*BASIN PLAN WATER QUALITY OBJECTIVES*

The following are existing Basin Plan water quality objectives for nutrients (i.e., biostimulatory substances), sediment, dissolved oxygen and temperature. The Basin Plan also has objectives for color, tastes and odors, floating material, suspended material, settleable material, oil and grease, turbidity, pH, bacteria, toxicity, pesticides, chemical constituents and radioactivity.

Table 12: Basin Plan water quality objectives	
<i>BIOSTIMULATORY SUBSTANCES</i>	
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.	
<i>SEDIMENT</i>	
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.	
<i>TEMPERATURE</i>	
The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. See table 13 (for proposed temperature objectives to protect salmonids).	
<i>EXISTING DISSOLVED OXYGEN OBJECTIVES 1993</i>	
Dissolved oxygen objectives for the Laguna de Santa Rosa (from Table 3-1 in Basin Plan)	
Minimum	7.0 mg/l
Lower 90% limit <sup>a</sup>	7.5 mg/l
Lower 50% limit <sup>b</sup>	10.0 mg/l
Dissolved oxygen concentrations shall conform to those limits listed in Basin Plan Table 3-1. For waters not listed in Table 3-1 and where dissolved oxygen objectives are not prescribed the dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time.	
Waters designated WARM, MAR, or SAL	5.0 mg/l
Waters designated COLD	6.0 mg/l
Waters designated SPWN	7.0 mg/l



Table 12: Basin Plan water quality objectives	
Waters designated SPWN during critical spawning and egg incubation periods	9.0 mg/l
<i>PROPOSED AMENDMENT TO DISSOLVED OXYGEN OBJECTIVES 2005</i>	
Proposed numeric dissolved oxygen objectives:	
Year round objective in the water column- A seven-day moving average of the daily minimum concentrations equal to or greater than 8 mg/L.	
Water column objective during the incubation/emergence life stage – A seven-day moving average of the daily minimum concentrations equal to or greater than 11 mg/L.	
The proposed narrative dissolved oxygen objective:	
The natural potential dissolved oxygen concentration of a waterbody shall not be altered unless it can be demonstrated, to the satisfaction of the Regional Board, that such alteration does not adversely affect beneficial uses.	

<sup>a</sup> 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.

<sup>b</sup> 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.

*PROPOSED WATER TEMPERATURE OBJECTIVES*

Proposed water temperature objectives are categorized by life stage. The objectives are the same for all salmonid species, except those that apply to the coho salmon incubation/emergence life stage. The time periods in the table are provided to give an idea of when the various life stages occur, and are intended to be adapted to site-specific conditions.

Life Stage	Time Period (Estimated)	MWAT <sup>1</sup> (C/F)	MWMT <sup>2</sup> (C/F)	Instantaneous Max (C/F)
Adult Migration	August-July	15/59	17/62.6	21/69.8
Adult Holding	May-Dec	14/57.2	16/60.8	21/69.8
Spawning Salmonids	Sept-April	11/51.8	13/55.4	22/71.6
Incubation/Emergence All Salmonids except Coho Salmon	Nov-May	11/51.8	13/55.4	22/71.6
Incubation/Emergence Coho Salmon	Nov-March	10/50	12/53.6	22/71.6
Juvenile Rearing	Year round	15/59	17/62.6	22/71.6
Smoltification	January-June	12/53.6	14/57.2	22/71.6

<sup>1</sup> MWAT – maximum weekly average temperature: The highest 7-day moving average of equally spaced water temperature measurements for the duration of the existing salmonid life stage.

<sup>2</sup> MWMT – maximum weekly average of the daily maximum temperatures: The highest 7-day moving average of the daily maximum water temperatures for the duration of the existing life stage.



## DISSOLVED OXYGEN OBJECTIVES

These are the proposed dissolved oxygen objectives for the North Coast Region, as of 2005:

*Year round objective in the water column:* A seven-day moving average of the daily minimum concentrations equal to or greater than 8 mg/L.

*Water column objective during the incubation/emergence life stage:* A seven-day moving average of the daily minimum concentrations equal to or greater than 11 mg/L.

*Intergravel objective during the incubation/emergence life stage:* A seven-day moving average of the daily minimum concentrations equal to or greater than 8 mg/L.

To account for the loss of dissolved oxygen associated with its transfer to the spawning gravels, a higher water column concentration is necessary during the incubation and emergence life stage. The Regional Board assumes that the difference between the water column and intergravel concentrations is 3 mg/L. The water column objective is subject to change if 1) site-specific research indicates a difference other than 3 mg/L and 2) intergravel dissolved oxygen concentrations are greater than 8 mg/L.

*The proposed narrative dissolved oxygen objective:* The natural potential dissolved oxygen concentration of a waterbody shall not be altered unless it can be demonstrated, to the satisfaction of the Regional Board, that such alteration does not adversely affect beneficial uses.



