

Draft 2008 California 303(d)/305(b) Integrated Report

Supporting Information

Regional Board 5 - Central Valley Region

Water Body Name:

Almanor Lake

Water Body ID:

CAL5184100020020418094956

Water Body Type:

Lake & Reservoir

DECISION ID 12608

Pollutant:

Mercury

Final Listing Decision:

List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:

New Decision

Revision Status

Revised

Sources:

Resource Extraction

Expected TMDL Completion Date:

2021

Impairment from Pollutant or Pollution:

Pollutant

Weight of Evidence:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant.

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

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 39 samples exceed the USEPA fish tissue criterion for human health, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Decision / Staff Recommendation:

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

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 12608

LOE ID: 22584

Pollutant:

Mercury

LOE Subgroup:

Pollutant-Tissue

Matrix:

Tissue

Fraction:

Total

Beneficial Use:

Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:

3

Number of Exceedances:

1

Data and Information Type:

PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:

Fish were sampled for tissue analysis at one location from Almanor Lake. A total of 1 out of 3 samples exceeded the USEPA fish tissue criterion for human health. The average wet weight methylmercury concentration in fish tissue was 0.08 ppm for the 3 samples collected. The number of fish collected per sample, the measured mercury concentrations in fish tissue, and the number of exceedances are, by species: Brown Trout- one 4-fish composite sample, 0.15 ppm, no exceedances; Smallmouth Bass- 2 composite samples, 0.20 ppm and 0.37 ppm, 1 exceedance. All 3 composite samples were collected from fish with average total lengths greater than 150 mm, which represent fish most commonly caught and consumed by sport fishers and their families.

Data Reference:

Mercury Contamination in Fish from Northern California Lakes and Reservoirs. State of California. The Resources Agency. Department of Water Resources. Northern District. July 2007

Water Quality Objective/Criterion:

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. The objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

Objective/Criterion Reference:

Central Valley Regional Water Quality Control Board. Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board - Central Valley Region

Evaluation Guideline:

The USEPA Fish Tissue Residue Criterion for methylmercury in fish is 0.3 mg/kg (0.3 ppm) for the protection of human health. This is the concentration in fish tissue that should not be exceeded based on a total fish and shellfish consumption-weighted rate of 0.0175 kg fish/day(USEPA, 2001).

Guideline Reference:

Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001

Spatial Representation:

Fish were collected from Almanor Lake.

Temporal Representation:

Fish samples were collected during the spring and summer of 2000 and 2001.

Environmental Conditions:

QAPP Information:

Data quality: Excellent. Quality control for sample collection, preparation, handling, and analyses were conducted in accordance with the Surface Water Ambient Monitoring Program Quality Assurance Program Plan (Puckett, 2002) with the following exception: instead of wrapping fish in Teflon sheets before being frozen and transported to the laboratory, the fish were wrapped in aluminum foil (dull side to skin). This wrapping method should not have affected mercury concentrations. Quality control procedures for selection of target fish species and compositing of samples followed the General Protocol for Sport Fish Sampling and Analysis developed by OEHHA (Gassel and Brodberg, 2005). Gassel, M. and R.K. Brodberg. 2005. General Protocol for Sport Fish Sampling and Analysis. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), Pesticide and Environmental Toxicology Branch. December 2005.

QAPP Information Reference(s):

LOE ID:

22576

Pollutant:

Mercury

LOE Subgroup:

Pollutant-Tissue

Matrix:

Tissue

Fraction:

Total

Beneficial Use:

Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:

36

Number of Exceedances:

4

Data and Information Type:

PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:

Fish were sampled for tissue analysis at two locations from Almanor Lake. A total of 4 out of 36 samples exceeded the USEPA fish tissue criterion for human health. 1) Almanor Lake (North): The average wet weight mercury concentration in fish tissue was 0.24 ppm for the 25 samples collected at this location. The number of fish collected per sample, the measured mercury concentrations in fish tissue, and the number of exceedances are, by species: Rainbow Trout- 1 sample, 0.08 ppm, no exceedances; Sacramento Sucker- 5 samples, 0.11-1.23 ppm (average 0.83 ppm), 4 exceedances; Smallmouth Bass- 2 samples, 0.08-0.11 ppm (average 0.10 ppm), no exceedances; Steelhead Trout- 12 samples, 0.06-0.14 ppm (average 0.10 ppm), no exceedances; Warmouth- 5 samples, 0.08-0.12 ppm (average 0.11 ppm), no exceedances. 2) Almanor Lake (South): The average wet weight mercury concentration in fish tissue was 0.08 ppm for the 11 fish tissue samples collected at this location. The number of fish collected per sample, the measured mercury concentrations in fish tissue, and the number of exceedances are, by species: Brown Bullhead- 6 samples, 0.03-0.13 ppm (average 0.08 ppm), no exceedances; Smallmouth Bass- 4 samples, 0.05-0.09 ppm (average 0.07 ppm), no exceedances; Warmouth- 1 sample, 0.06 ppm, no exceedances. All 36 samples were collected from fish with total lengths greater than 150 mm, which represent fish most commonly caught and consumed by sport fishers and their families.

Data Reference:

Fish Mercury Project, Year 2 Annual Report, Sport Fish Sampling and Analysis. Final Report. October 2007

Water Quality Objective/Criterion:

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. The objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

Objective/Criterion Reference:

Central Valley Regional Water Quality Control Board. Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board - Central Valley Region

Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001

Evaluation Guideline:

The USEPA Fish Tissue Residue Criterion for methylmercury in fish is 0.3 mg/kg (0.3 ppm) for the protection of human health. This is the concentration in fish tissue that should not be exceeded based on a total fish and shellfish consumption-weighted rate of 0.0175 kg fish/day. (USEPA, 2001)

Guideline Reference:

Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001

Spatial Representation:

Fish were collected from the northern and southern portions of Almanor Lake.

Temporal Representation:

Fish samples were collected during one sampling event between 7/24/2006 and 7/25/2006.

Environmental Conditions:

QAPP Information:

Data quality: Excellent.. Quality Control for all of the elements described in section 6.1.4 of the Policy was conducted in accordance with the Laboratory QAPP developed by Moss Landing Marine Laboratories (MLML, 2005). This data was also collected and analyzed in accordance with the CALFED Mercury Project QAPP (Puckett and van Buuren, 2000).

QAPP Information Reference(s):

DECISION ID

4323

Pollutant:

Temperature, water

Final Listing Decision:

Do Not List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:

Do Not List on 303(d) list (TMDL required list)(2006)

Revision Status

Original

Impairment from Pollutant or Pollution:

Pollutant

Weight of Evidence:

This pollutant is being considered for placement on the section 303(d) list under sections 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Based on section 3.2 the site has a few exceedances of temperature guidelines. Also, there is no evidence that human activities are modifying the temperature regime so as to adversely impact cold water species.

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

This conclusion is based on the staff findings that:

1. The water temperature guideline used complies with the requirements of section 6.1.3 of the Policy.
2. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
3. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
4. Three of 5 annual maximum temperature values exceeded the water temperature guideline and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and

information are available indicating that standards are not met.

RWQCB Board Decision / Staff Recommendation:

This is a decision made by the State Water Resources Control Board and approved by the USEPA in 2006 . No new data were assessed by the Regional Board for 2008. The decision has not changed.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 4323

LOE ID:

724

Pollutant:

Temperature, water

LOE Subgroup:

Pollutant-Water

Matrix:

Water

Fraction:

None

Beneficial Use:

Cold Freshwater Habitat

Number of Samples:

5

Number of Exceedances:

3

Data and Information Type:

Not Specified

Data Used to Asses Water Quality:

Lake Almanor was sampled at 2 stations (LA1-B and LA1-S) for 2000-2002. Each station had a set of 4 daily maximum temperature values, one for each month

(June to September) for each year. Only 2000 and 2002 data was used for station LA1-B. Based on these sets of values, the annual maximum temperature for each year was determined for each station. There were a total of 5 annual maximum temperatures. Three of these values exceeded the 21.0°C steelhead criteria (PG&E, 2003C), (PG&E, 2003A).

Two samples out of 6 samples collected exceeded the temperature guideline for steelhead (PG&E, Rock Creek-Cresta FERC Project No. 1962, 2003; PG&E, Project FERC No. 2105, 2004). These samples were exceeded in July and August for the site at Lake Almanor at Canyon Dam near the surface.

Data Reference:

Placeholder reference 2006 303(d)

Water Quality Objective/Criterion:

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.

Objective/Criterion Reference:

Placeholder reference 2006 303(d)

Evaluation Guideline:

The guideline used was from Sullivan et al. (2000) Published Temperature Thresholds-Peer Reviewed Literature which includes reviewed sub-lethal and acute temperature thresholds from a wide range of studies, incorporating information from laboratory-based research, field observations, and risk assessment approaches. This report calculated the Annual Maximum (instantaneous maximum observed during the summer) upper threshold criterion for steelhead trout as 21.0°C. The risk assessment approach used by Sullivan et al. (2000) suggests that an upper threshold for the Annual Maximum of 21.0°C for steelhead will reduce average growth 10% from optimum.

Guideline Reference:

Placeholder reference 2006 303(d)

Spatial Representation:

The two sample sites represent the area of the Lake that drains in the North Fork Feather River. The two sample sites were at Lake Almanor at Canyon Dam near the surface and near the bottom of the water body.

Temporal Representation:

Samples were collected during the summer months (June, July, August, and September) of 2000-2002.

Environmental Conditions:

QAPP Information:

Rock Creek--Cresta Project Water Temperature Monitoring Plan.

QAPP Information Reference(s):

LOE ID:

723

Pollutant:

Temperature, water

LOE Subgroup:

Testimonial Evidence

Matrix:

Not Specified

Fraction:

None

Beneficial Use:

Cold Freshwater Habitat

Number of Samples:

0

Number of Exceedances:

0

Data and Information Type:

Not Specified

Data Used to Assess Water Quality:

Information received from RWQCB staff (PG&E, Rock Creek-Cresta FERC Project No. 1962, 2003; PG&E, Project FERC No. 2105, 2004). The existence of reservoirs results in an inherent temperature regime. Reservoirs take on their own individual temperature regimes, which includes seasonal development of warm and cold water layers. This has nothing to do with human induced impacts. Specifically for Lake Almanor, there is no evidence that human activities are modifying the temperature regime so as to adversely impact cold water species.

Data Reference:

Placeholder reference 2006 303(d)

Water Quality Objective/Criterion:

Basin Plan: ...Achievement of the [water quality] objectives depends on applying them to controllable water quality factors. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of waters of the state...and that may be reasonably controlled.

Objective/Criterion Reference:

Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation:

Temporal Representation:

Environmental Conditions:

QAPP Information:

QA Info Missing

QAPP Information Reference(s):