

Overview of the Temperature Data Analysis

Central Valley Water Board
Temperature Listing Public Workshop

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Overview Outline

- Background
- General Temperature Data Analysis Process
- The Merced River Example
- Next Steps

Background

- California Department of Fish and Game Submittal – February 2007
- Central Valley Water Board Staff Initial Analysis – April 2007
- Public Workshop – September 2007
- Central Valley Water Board Action – Tentatively April 2008

Background

- CA DFG Listing Requests
 - Merced River
 - Tuolumne River
 - Stanislaus River
 - San Joaquin River

Background – Aquatic Life Beneficial Uses

River	Warm Fresh-water Habitat	Cold Fresh-water Habitat	Warm MIGR	Cold MIGR	Warm SPWN	Cold SPWN
San Joaquin	√		√	√	√	
Merced	√	√	√	√	√	√
Tuolumne	√	√		√	√	√
Stanislaus	√	√		√	√	√

Background

- Listing Policy Fact Sheets
 - 4 Separate Listing Fact Sheets
 - Each Fact Sheet will have up to 5 Lines of Evidence
 - COLD MIGR (Adult Salmon Migration)
 - COLD MIGR (Smolt Out-Migration)
 - COLD SPAWN
 - COLD SPAWN, Steelhead Rearing
 - History of the Fisheries

Background

- Anadromous Fish Life Stages of Concern
 - Adult Migration
 - Smolt Out-Migration
 - Spawning
 - Steelhead Summer Rearing

Background

- Basin Plan Water Quality Objective for Temperature
 - Narrative Objective
 - 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 (Basin Plan, III-8)
 - Need an Evaluation Guideline

Background

- Life Stage Criteria (7 Day Avg of Daily Max)
 - Adult Migration Criteria = 18 C/64 F
 - Smolt Out-Migration = 15 C/59 F
 - Spawning = 13 C/55 F
 - Steelhead Summer Rearing = 18 C/64 F

General Analysis Process

➤ Site Locations

- Each location on the river would be analyzed individually

➤ Apply Appropriate Criteria

- Criteria would be chosen based on life stage

➤ Count Exceedances

- How many data points are over the criteria

General Analysis Process

- Use Table 3.2 (Binomial Method) of the Listing Policy
 - Table provides a minimum number of exceedances needed to list for impairment.
 - Compare the number of exceedances to the total number of samples.
- Determine Impairment for Location

General Analysis Process

- Analyze Locations as a Whole
 - Determine if the entire stretch is impaired based on the results of the individual locations.
- Apply Process
 - Same process would be used on all four rivers at all locations.

Merced River Example Sample Locations

➤ Merced River Background

- 10 Sampling Locations
 - River Miles 1 – 52 (SJR Confluence to the Merced River Hatchery)
- Sampling occurred from 1996 – 2006

Merced River Example Life Stages Locations

- Where on the River are the Life Stages?
 - Adult Migration – River Miles 1 – 52
 - Smolt Out-Migration – River Miles 52 – 1
 - Spawning – River Miles 28 – 52
 - Steelhead Summer Rearing – River Miles 42 - 52

Merced River Example Life Stage Timelines

➤ Julian Weeks

- CDFG's Analysis
- Each Week is Numbered 1 – 52
- January – December = 52 Weeks

Merced River Example Life Stage Timelines

- When do the life stages occur on the Merced River?
 - Adult Migration
 - Weeks 36 – 43
 - September 1st – October 31st
 - Smolt Out-Migration
 - Weeks 11 – 24
 - March 15th – June 15th

Merced River Example Life Stage Timelines

- When do the life stages occur on the Merced River?
 - Spawning
 - Weeks 40 – 50
 - October 1st – December 15th
 - Steelhead Summer Rearing
 - Weeks 24 – 37
 - June 15th - September 15th

Merced River Analysis

River Mile 1

Adult Migration Life Stage

Units – degree Celsius

RM 1	Years										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
36				25.9	23.7	24.3	25.2			22.6	
37			20.7	25.4	24.6	23.6	25.5			19.5	
38			19.2	25.0	25.6	23.5	25.5			19.1	
39			17.7	24.5	23.7	22.1	23.2			18.7	
40			16.4	22.4	23.0		20.5			19.7	
41			15.7	22.2	19.6		21.1			19.6	
42			15.4	18.0	17.5	17.4	17.6			18.5	
43			16.6	17.4	14.7	16.2	15.9			18.0	

Merced River Analysis

River Mile 1 Cont'd

➤ River Mile 1 Analysis

- Appropriate Criteria = 18 C
- Total Number of Samples = 45
- Number of Samples above Criteria = 31
- Table 3.2 Requirements = minimum of 8
- Result – Location is impaired for the life stage

Merced River Analysis Whole River

➤ River Mile Analyses

- Completed same analysis for each of the 10 locations on the Merced River.
- Every location except River Mile 52 (Merced River Hatchery) exceeded the criteria for the adult migration life stage.

➤ Overall Analysis Result

- Merced River exceeded the criteria from the SJR confluence to G Street Bridge (River Mile 46) for the adult migration life stage.

Merced River Analysis

All Life Stages

➤ Final Analysis Step

- Apply analysis to all four life stages.
 - For Merced River, consider whole stretch exceeding the criteria because every location exceeded the temperature criteria for at least one of the life stages

Next Steps

➤ Complete the Analysis

- History of the Fisheries
 - Listing Analysis Not Yet Complete
- Workshop Comments
 - Incorporate any changes that come out of this workshop
- Determine the overall listing recommendation
- Develop Fact Sheets

Questions?