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California Regional Water Quality Control Board
North Coast Region
William R. Massey, Chairman

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To: **Craig J. Wilson**
SWRCB - DWQ

From: **Bruce Gwynne, Environmental Scientist**
TMDL Development Unit

Date: **June 10, 2004**

Subject: Salmon River nutrient delisting recommendation

The Salmon River, tributary to the Klamath River in Siskiyou County, was included in a nutrient impaired listing of Hydrologic Unit 105.00 (Klamath River Basin) pursuant to the requirements of Clean Water Act (CWA) section 303(d). The Klamath River mainstem is the subject of separate analysis and TMDL development for impairments, of which nutrients is one.

The Salmon River was added to the 303(d) list for nutrients in 1992. In the summer of 2002, Regional Water Board staff conducted a water quality monitoring effort to evaluate impairment of the Salmon River watershed by nutrients. The monitoring plan involved collecting grab samples on three consecutive days once per month in June through October at locations in the Salmon River watershed located immediately downstream of community centers within the watershed. These locations included the North Fork downstream of Sawyers Bar, the South Fork downstream of Cecilville, the Salmon River downstream of Forks of Salmon and near the mouth. In addition, grab samples were collected near the mouth of Wooley Creek; this site was considered a control site, as the subwatershed is a wilderness area. These sample locations and the monitoring period were selected to represent potential worst case conditions. Our assumption was that if anthropogenic sources of nutrients were present in the watershed, they would be detectable downstream of the community centers and attributable to failing septic systems or landscape fertilization.

The grab samples were analyzed for Ammonia as Nitrogen, Nitrate/Nitrite as Nitrogen, Total Kjeldahl Nitrogen, Orthophosphate as Phosphorus, and total Phosphorus. In addition, dissolved oxygen, temperature, pH, and specific conductance were measured using YSI 600XL sondes when grab samples were collected.

In all but a few cases, all nutrient parameters were non detect. We did collect blind duplicate samples as a data quality control measure. We will need to summarize this information from the laboratory reports.

Dissolved oxygen levels measured during the monitoring program all exceeded 8.0 mg/L. (Note: the WQO for DO is a minimum of 9.0...) The Karuk, in cooperation with USFWS, deployed a datasonde at the mouth of the Salmon River for the summer months in 2001, 2002, and 2003.

We conducted quasi-quantitative surveys of the percent cover of attached algae in the river at the monitoring locations in July and August. The surveys involved making visual estimates of the percent cover of attached algae within the immediate vicinity of the monitoring locations. Observations of the conditions of the attached algal community were also noted during the surveys.

The rationale for conducting the survey was to evaluate "nuisance" growths of aquatic plants, in relation to the narrative objective for 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.

The results of the attached-algae surveys are presented in the following table.

Location	Date	Percent Cover	Notes
South Fork d/s of Cecilville	July 24, 2002	0-10	Very thin layer of diatoms on rocks.
	August 26, 2002	40-50	Thin film of short filamentous algae, mostly dead.
North Fork d/s of Sawyers Bar	July 24, 2002	0-10	Thin diatom film on rocks.
	August 26, 2002	20-30	Fine, short filamentous algae, majority dead and sloughing.
Salmon River d/s of Forks of Salmon	July 24, 2002	0-10	Short filamentous algae, brown in color.
	August 26, 2002	50-60	Thin film of diatoms, with some filamentous algae.
Salmon River near mouth	July 24, 2002	20-30	Thick, filamentous algae, green. None present in center of flow.
	August 26, 2002	0-10	Patchy filamentous algae, mostly dead and sloughing.
Wooley Creek near mouth	July 24, 2002	0-10	Thin film of diatoms on rocks.
	August 26, 2002	30-40	Very thin layer of diatoms on rocks.

Conclusions

Based on the available data, there is no indication that nutrients are impairing the Salmon River watershed. Analytical results of nutrient grab samples were generally non-detect. Data were collected compliant with a quality assurance plan. Blind duplicate analyses were performed, with acceptable results. Further, observations of attached algae, presence of which represents a primary biological response to nutrient concentration in streams, indicate that aquatic plants do not reach nuisance levels. Regional Water Board staff recommend that the Salmon River be delisted for nutrients.

Following are tables showing the data described above.

Salmon River Nutrient Data – 2002 – NCRWQCB

Mainstem Salmon River at USGS Gage

Date	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC
6/9/2002	0.00051		ND	ND	7.57	ND	ND	36	ND	ND	
6/10/2002	ND			0.052	ND	7.59	ND	ND	40	ND	ND
6/11/2002	ND		ND	ND	7.54	ND	ND	58	ND	ND	
7/22/2002	ND	13	ND	ND	7.86	ND	ND	54	ND	ND	0.9
7/23/2002	ND	40	0.062	ND	8.03	ND	ND	92	ND	0.7	1.1
7/24/2002	ND		ND	ND		ND	ND	50	ND	ND	
8/26/2002	0.00061		ND	ND		ND	ND	92	ND	ND	
8/27/2002	ND		ND	ND		ND	ND	80	ND	ND	
8/28/2002	ND		ND	ND		ND	ND	98	ND	ND	
10/2/2002	0.0048	DETECT	ND	ND		ND	ND	120	ND	ND	1.1
10/3/2002	0.005	DETECT	ND	ND		ND	ND	30	ND	ND	1

Wooley Creek

Date	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC
6/9/2002	ND		ND	ND	7.58	ND	ND	88	ND	ND	
6/10/2002	ND		0.056	ND	7.59	ND	0	42	24	ND	
6/11/2002	ND		ND	ND	7.51	ND	ND	30	ND	ND	
7/22/2002	ND		0.052	ND	7.85	ND	ND	46	ND	ND	0.9
7/23/2002	ND	34	ND	ND	7.61	ND	ND	48	ND	ND	1.3
7/24/2002			ND	ND		ND	ND	68	ND	ND	
8/26/2002	ND		ND	ND		ND	ND	98	ND	ND	
8/27/2002	ND		ND	ND		ND	ND	110	ND	ND	
8/28/2002	ND		ND	ND		ND	ND	88	ND	ND	
10/2/2002	0.0055	DETECT	ND	ND		ND	ND	110	ND	ND	1
10/3/2002	0.0044	DETECT	ND	ND		N	N	12	ND	ND	1.1

Mainstem Salmon River at Forks of Salmon

Date	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC
6/9/2002	ND		ND	ND	7.64	ND	ND	44	ND	ND	
6/10/2002	ND		ND	ND	7.48	ND	ND	34	ND	ND	
6/11/2002	ND		ND	0.15	7.25	ND	ND	30	ND	ND	
7/22/2002	ND	130	ND	ND	7.97	ND	ND	64	ND	ND	0.9
7/23/2002	ND	30	ND	ND	8.15	ND	ND	78	ND	0.6	1.2
7/24/2002	ND		ND	ND		ND	ND	74	ND	ND	
8/26/2002	ND		ND	ND		ND	ND	84	ND	ND	
8/27/2002	ND		ND	ND		ND	ND	88	ND	ND	
8/28/2002	ND		ND	ND		ND	ND	90	ND	ND	
10/2/2002	0.0044	DETECT	ND	ND		ND	ND	150	ND	ND	1
10/3/2002	0.0041	DETECT	ND	ND		ND	ND	24	ND	ND	1

North Fork Salmon at Sawyers Bar

Date	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC
6/9/2002	ND		ND	ND	7.52	ND	ND	20	ND	ND	
6/10/2002	ND		ND	ND	7.17	ND	ND	18	17	ND	
6/11/2002	ND		ND	ND	7.22	ND	ND	20	ND	ND	
7/22/2002	ND	23	ND	ND	7.78	ND	ND	50	ND	ND	0.9
7/23/2002	ND	70	ND	ND	7.81	ND	ND	48	ND	ND	1.6
7/24/2002	ND		ND	ND		ND	ND	98	ND	ND	
8/26/2002	ND		ND	ND		ND	ND	86	ND	ND	
8/27/2002	ND		ND	ND		ND	ND	54	ND	ND	
8/28/2002	ND		ND	ND		ND	ND	72	ND	ND	
10/2/2002	0.0035	DETECT	ND	ND		ND	ND	100	ND	ND	1
10/3/2002	0.0054		ND	ND		ND	ND	24	ND	ND	1

South Fork Salmon at Cecilville

Date (11 Samples)	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC	
6/9/2002	ND		ND	ND	7.29	ND	ND	30	ND	ND		
6/10/2002	ND		ND	ND	7.11	ND	ND	22	27	ND		
6/11/2002	ND		ND	ND	6.97	ND	ND	20	ND	ND		
7/22/2002	ND	50	ND	ND	7.37	ND	ND	14	ND	ND		1.2
7/23/2002	ND	300	ND	ND	7.41	ND	ND	78	ND	0.8		1.7
7/24/2002	ND		ND	ND		ND	ND	60	ND	ND		
8/26/2002	ND		ND	ND		ND	ND	62	ND	ND		
8/27/2002	ND		ND	0.058		ND	ND	60	ND	ND		
8/28/2002	ND		ND	ND		ND	ND	62	ND	ND		
10/2/2002	0.0045	DETECT	ND	ND		ND	ND	110	ND	ND		1.1
10/3/2002	0.0052	DETECT	ND	ND		ND	ND	18	ND	ND		1.1

Date	Chl-a	Total Coliform	NH3 as N	NOx as N	pH	o-PO4 as P	P	TDS	TSS	TKN	TOC	
Duplicates												
SRUSGS	ND		ND	ND	7.54	ND	ND	58	ND	ND		
6/11/2002	ND		ND	ND	7.61	ND	ND	50	ND	ND		
SRUSGS	ND	40	0.062	ND	8.03	ND	ND	92	ND	0.7		1.1
7/23/2002	ND	50	ND	ND	8.14	ND	ND	62	ND	ND		1.1
SRUSGS			ND	ND		ND	ND	98	ND	ND		
8/28/2002			ND	1.4		ND	ND	74	ND	ND		
SRUSGS	0.005		ND	ND		ND	ND	30	ND	ND		
10/3/2002	0.006		ND	ND		ND	ND	36	ND	ND		

Regional Water Board staff would like to reserve the option to provide further support for this recommendation if necessary.

If you have any questions regarding these comments, please telephone me at (707) 576-2661.

Attachments: Map showing location of Salmon River Watershed


Oregon
California
N
Salmon River HA 105.2
Miles
0 5 10 20 30 40 50