Cal/EPA

Lahontan Regional Water Quality Control Board

South Lake Tahoe Office

2501 Lake Tahoe Blvd.
South Lake Tahoe, CA
96150
(916) 542-5400
FAX (916) 544-2271

March 11, 1998

Ralf Koehne
U.S. Forest Service, Plumas National Forest
P.O. Box 11500
Quincy CA 95971

Pete Wilson
Governor

Dear Mr. Koehne:

REQUEST FOR WATER QUALITY INFORMATION ON "TOP SPRING" FOR USE IN DEVELOPMENT OF TOTAL MAXIMUM DAILY LOADS (TMDLS)

Peter Fischer, a student assistant working under the supervision of Dr. Judith Unsicker of my staff, recently requested information from your office on "Top Spring". You have asked for a formal letter documenting the request and explaining how the information will be used.

Section 303(d) of the federal Clean Water Act requires states to identify surface water bodies which are not meeting water quality standards and are not expected to do so even with technology based controls. Updated lists of these waters must be submitted to the U.S. Environmental Protection Agency (USEPA) every two years. For each listed water, Section 303(d) requires states to develop "Total Maximum Daily Loads" (TMDLs) for each pollutant causing impairment, on the assumption that reduction of pollutant loading from all sources will lead to attainment of the standards. The Section 303(d) TMDL requirements were developed largely in the context of point source discharges, and they provide little guidance on development of TMDLs for nonpoint source pollutants or for waters which do not meet standards due to natural conditions. The latter category includes saline lakes, geothermal springs, and waters influenced by natural sources of radioactivity such as Sierra Nevada granite.

Following the update of our Section 303(d) list in January 1998, the Lahontan Region currently has 73 water bodies "listed", some of them for multiple pollutants. Some of these waters are impaired only or primarily due to natural causes. The USEPA has directed California to develop TMDLs for all pollutants causing impairment in all listed water bodies, over a 13 year period. TMDLs must be adopted by our Board as amendments to the Lahontan Basin Plan, and approved by the USEPA. Although Section 303(d) speaks only to TMDL development, there is an implied expectation that water quality attainment strategies will be implemented, through regulatory action if necessary.

Most TMDLs will require monitoring and modeling of data on a watershed basis, extensive stakeholder involvement, several years of staff work, and large amounts of funding. We currently refer to these as "hard TMDLs". Unless substantial additional resources become available for hard TMDLs, it is unlikely that the USEPA deadline

can be met. However, USEPA Region IX staff have also defined a category of "easy TMDLs", for which a lower level of effort is acceptable. These include ongoing water protection/restoration efforts by other agencies which can be documented to be the equivalent of TMDLs, and also TMDLs for naturally impaired water bodies. In the latter case, the USEPA simply requires states to document that the impairment is natural, and that it cannot feasibly be corrected by human activities.

During the 1980s, there was media coverage on the fact that a spring used for drinking water supply to the Laufman Ranger Station (in the Honey Lake Watershed) had been abandoned due to levels of radioactivity exceeding drinking water standards. We received a short U.S. Forest Service monitoring report which referred to the spring as "Top Spring"; when we asked the reason for the name we were told that it was the highest in elevation of several springs. (We understand that this may be the same spring now called "Upper Road Spring".) Because it met listing criteria in State Water Resources Control Board and USEPA guidance, Top Spring was formally placed on the Section 303(d) list during the 1989/90 Water Quality Assessment process.

The USEPA, Region IX has given us a limited amount of grant funding to be used this year to ensure *completion* of some TMDLs within the near future. We have decided to use these funds to finish one ongoing "hard TMDL", and to initiate "easy TMDLs for 25 other water bodies. These include 17 waters which are probably "naturally impaired", in addition to Top Spring. We expect to include TMDLs for waters impaired by natural sources in our next set of Basin Plan amendments, which could be considered for adoption by our Board as early as January 1999. Although we still need to discuss the exact format of these TMDLs with USEPA staff, TMDLs for naturally impaired waters will probably be addressed together in a single "Use Attainability Analysis" report which meets the guidelines in the USEPA's "Water Quality Standards Handbook". Use Attainability Analyses summarize background information on water bodies, available monitoring data, water quality problems, and the adequacy of control measures to ensure attainment of designated beneficial uses. In the case of Top Spring, the Municipal and Domestic Supply (MUN) use would be the one under consideration. Your office will be given the opportunity to review and comment on the proposed TMDLs and other Basin Plan amendments.

We would appreciate any information you can provide on the history of the problem, and any additional water quality monitoring data if available. Please send this information to the attention of Peter Fischer at the address above.
Please contact Dr. Judith Unsicker at (530) 542-5417 (email address: unsij@rb6s.swrcb.ca.gov) if you have further questions about our Section 303(d)

listing or TMDL development processes. A copy of a staff report which provides additional information on Section 303(d) and TMDLs is enclosed for your reference.

Sincerely,

Ranjit S. Gill

Ranjit S. Gill, Ph.D.
Environmental Specialist IV (Supervisor)

Enclosure

cc: Joe Karkowski, Division of water Quality, SWRCB
Stefan Lorenzato, Division of Water Quality, SWRCB

JEU/shT:topspring

From: "Peter J. Fischer" <pfischer@med.unr.edu>
To: Judith Unsicker <Unsij@rb6s.swrcb.ca.gov>
Date: 2/22/00 5:12PM
Subject: top springs

Judith, here is the phone log on 7/28/98 from my conversations asking about Top Springs. I'm not sure if this is a following up to the memo we sent out or prior to the memo. I should have kept a more detailed log of who said what -- live and learn.

Peter

On 7/28/98 Peter Fischer (student) called Doug Ames at Lassan health dept.

I was directed to Office of Drinking Water State of California in Redding - for small water system 530-224-4800 - I talked with Dick Hinricks 530-224-4867 who (I believe) indicated that Top springs had been disconnected and was no longer a drinking water problem. This office has a file on Top Springs and a protocol to determine the health effects of radiation in drinking water-you might be interested in both.

I also was tried to contact the Plumas national forest who ran the water system but have no records of these conversations.

The local ranger Jim Ballard 530-253-2223

And the ranger out of Quincy Jerry Carpenter 530-283-7778

MILFORD (Lassen Co.) SMALL WATER

Art Prince (916) 283-2050 of Plumas National Forest called to report a gross alpha radiological analysis of 11.3 pCi/l for Milford. He did not know the error count. Apparently this was a follow-up sample. These samples were analyzed by a lab in Grass Valley. They will be taking another follow-up sample Friday 3/7/86 which will be analyzed by Henrici. In addition, they will sample for radium 226 since it only costs $50 compared to $35 for gross alpha, and is the next step as outlined by the regulations.

I informed Art that there was no need for immediate action as far as treatment or alternative sources until all the results were in. Harmful effects from these contaminants act over a long term. Art will send us the results of the previous analyses as soon as he gets them. He will contact us on the results of tomorrow's tests. He indicated they may take anywhere from 6 to 20 days.

Tony Wiedemann 3/6/86

LAUGHMAN RANGER STATION (Lassen Co.) SMALL WATER

Elizabeth Greenberg called. Janice Irvin stopped in Lassen County Health Department to discuss high gross alpha count recently obtained from water system at Laughman Ranger Station. Her husband is Robert (Jeff) Irvin who is station foreman. I told Elizabeth this sounded like information that we had heard before. I checked with Tony. He had spoken to Art Prince with Plumas National Forest in Quincy. Told Elizabeth there is apparently a communication gap. Elizabeth said that Janice reports a high incidence of leukemia and bone cancer in this area and is concerned. I told Elizabeth that Art Prince is apparently arranging for additional testing. I told Elizabeth I would speak to Tony then to Art and suggest he call the Irvins. Office phone for Robert Irvin is 253-2223 and home phone is 253-3671.

I called and spoke to Art Prince. Art said he told Dave Mann at the ranger station that additional testing was underway and to inform others of this. This apparently didn't happen. Art said that he will call Robert Irvin to discuss. Art said he will copy us on correspondence and keep us posted.

Richard L. Hinrichs 3-11-86

LAUGHMAN RANGER STATION (LASSEN CO.) - Small Water System

I spoke to Art Prince (Phone # 916-283-2050). Art reported that most recent tests showed high gross alpha counts. One was 27 plus or minus 7 and the other was 39.6 (error not specified). Art reports that local people are somewhat in a panic. Art said he wants to be sure that the samples collected and procedures followed are proper. Apparently some people are already questioning which labs are doing the work. Told Art I would check on getting samples to our Berkeley San. and Rad. Lab.

I called Tim Hall in Susanville. Tim said that the system is served by two springs, a horizontal well, and a vertical well. Last week additional samples were collected at the four sources except one of the springs which did not have a location that could be readily sampled.

I called Dick Henrici of Henrici Lab. He reported that original gross alpha count was made by Cranmer Lab. Analyses for radium were made by Fruit Growers Lab in Santa Paula. Fruit Growers reported that both radium isotopes were less than 1 pCi/liter. They are reportedly continuing with uranium test Dick said if we need to contact Fruit Growers, the contact person's name is "Ming", phone number 805-525-3824.

I called Martin Peterson of Sierra-Cascade Lab. He reported that samples were sent to Scott Lab in San Rafael. They can do gross alpha, but not radium isotopes. Martin said he thought that EAL Lab in Richmond was the only lab that could do isotopes. He didn't know Fruit Growers Lab was State certified for isotopes.

Richard L. Hinrichs March 24, 1986

LAUFFMAN RANGER STATION (SEN CO.) - Small Water Sy: m

I called Art Prine and told him that tentatively I would come up on Tuesday April 1, 1986 and collect 5-gallon samples for radiochemical analyses at the four sources and one at the tap sampled previously. Our lab in Berekely is sending the cubitainers up to Redding. I then called Tim Hall to advise him of this. I told Tim that I will inform him of whatever activities we are involved in at the ranger station. Tim mentioned that one of the samples may need to be "packed out" about one-half mile.

Richard L. Hinrichs March 25, 1986

LAUFMAN RANGER STATION (Lassen Co.) SMALL WATER

In the company of Doug Ames and Tim Hall, I went to the ranger station and collected 5 water samples. I collected one sample at each water source and one at the sink in the coffee room. At the road side spring, we discovered that the water was not flowing from the pipe which carries water from the spring to the system. Apparently the spring is poorly developed and was plugged. The operators said that they had occassionally backflushed the spring to restore capacity. The sample here was collected from the plastic used to collect water at the springs. At the vertical well, top spring, and the roadside spring, it was necessary to collect the samples in a one-gallon plastic jug and transfer them into the 5-gallon container. The one-gallon jug was rinsed five times with the water being sampled before it was used to transfer water.

At the juction of the line from the horizontal well and the top spring, a valve was shut and a union was removed so that we were confident that the water being sampled was from these two sources and was not being affecte by the other source?

Richard L. Hinrichs 4-7-86

LAUFMAN RANGER STATION (Lassen Co.) SMALL WATER

Dick Henrici called to report that the uranium result from a sample collected at the coffee room sink was 26 $\pm$ 6.4 pC/l. I asked Dick if the result said that this was a counting error as I thought uranium was analyzed chemically. Dick said he wasn't sure. It didn't say counting error, but he assumed it was. Gross alpha result on same sample was 27 $\pm$ 7.5 pC/l. Dick asked for a copy of any information we had on uranium toxicity.

Richard L. Hinrichs 4-7-86

LAUFMAN RANGER STATION (Lassen Co.) SMALL WATER

Bill Stradlee called from the ranger station. Bill reported that they believe that the water sample taken previously at the roadside spring probably was water being "back fed" from the top spring. Bill said that there is a spring which they may consider for potential use. They could collect a sample for gross alpha analysis to see if development of a water source here as an alternative makes sense. Told Bill that this would be a good idea but a horizontal well placed into the hillside might produce water with a higher or lower gross alpha count, a sample would not give a guarantee of future water quality. Bill said he is considering shutting off the top spring and flushing out the system and then re-samplin to see if he gets better water. I told Bill when I had complete results from our Berkeley lab I would let him know.

Richard L. Hinrichs 4-14-86

LAUFFMAN RANGER STATION (LASSEN CO.) - Small Water System

Art Prince of Plumas National Forest called to report preliminary results of followup gross alpha analyses. The one sent to Susanville (Sierra Cascade Lab who sent it to Fruit Growers Lab) is about 34 pCi/l. Art does not know error count. The one sent to Henrici Labs, which was also sent to another lab for analysis, is reportedly higher than the previous 11.3 pCi/l result.

Art is concerned whether or not they should immediately turn off the supply and go to bottled water. He said some people at the ranger station have heard rumors and are concerned. I reiterated that the effects of radioactivity at the levels measured is long term. We need the final results before making recommendations.

Art said the system serves about 4 - 5 residences, 20 - 30 day workers, and he thinks two campgrounds.

Tony Wiedemann March 19, 1986

LAUFMAN RANGER STATION (Lassen Co.) SMALL WATER

Carolyn Wong called from the Rad lab with results on samples taken on April 1, 1986. I also spoke to George Uyesugi of the Rad lab. Results are as follows:

	Sample	Gross Alpha	Uranium	Total Radium
1.	Vertical Well	2.3 ± 0.9	NA	NA
2.	Horizontal Well	4.7 ± 1.2	2.0 ± 1.2	NA
3.	Roadside spring	4.4 ± 1.1	3.3 ± 0.3	NA
4.	Top spring	25.3 ± 2.6	13.5 ± 1.4	1.3 ± 0.3
5.	Coffee sink	35.9 ± 3.1	18.1 ± 1.8	0.3 ± 0.1

I asked George what he would expect is causing the balance of the gross alpha counts and is additional lab work warranted to further define what is happening here? George said he would expect that it is Thorium or other daughters of Uranium. George pointed out that samples 1 through 4 meet drinking water standards and additional work was not required. I explained the anomaly to George. Sample 5 is higher than any of the sources. George thought it could be due to sediment, but had no new ides.

I called Art Prince. They are going to flush out the system. Also plan to redevelop and resample the roadside spring as an earlier sample (which may have been top spring water flowing backwards through the line which connects the roadside spring to the system) showed that this spring was high in gross alpha coutns. Art said that they would send samples after flushing (including additional distribution system samples) to a private lab. Told Art we would do follow up to confirm if necessary.

I called Doug Ames. I gave Doug the results. Told Doug about my conversation with Art Prince.

Richard L. Hinrichs 4-18-86

LAUFMAN RANGER STATION (LASSEN COUNTY) - SMALL WATER

I called Doug Ames to follow-up on Laufman Ranger Station. Doug reported that the problem was confirmed to be the top spring which our SEB testing showed was much higher than the other sources. The system was flushed thoroughly and the radiological quality of the water in the distribution system now reportedly meets standards.

Richard L. Hinrichs 7/21/86

United States Department of Agriculture
Forest Service
Plumas National Forest
159 Lawrence Street
P. O. Box 11500
Quincy, CA 95971-6025
916-283-2050

File Code: *
Route To: *

Date: 3/31/98

Subject: Top Springs Water Reports*

APR 02 1998

To: Ranjit S Gill
Peter Fischer

Dear Ranjit and Peter

I hope the attached documents are what you're looking for.

Ralph Koehne
PE

Henrici Water Laboratory
1832 Butterfly Valley Road Quincy, California 95971
Phone: (916) 281-6588

NAME: PLUMAS NATIONAL FOREST
ADDRESS: LAUFMAN RANGER STATION
CITY: Milford, Ca. 96122

LABORATORY NO: 10908
DATE SUBMITTED: 1/29/86
DATE REPORTED: 2/25/86

WATER ANALYSIS REPORT

RADIOCHEMICAL GROSS ALPHA..... 11.3 pCi/L (counting error = 1.7)

These results were obtained by following standard laboratory procedures: the liability of the laboratory shall not exceed the amount paid for this report. Some of the analysis may have been referred to one or more licensed laboratories.

Carolyn N. Henrici
Laboratory Director

Henrici Water Laboratory
1832 Butterfly Valley Road Quincy, California 95971
Phone: (916) 281-6588

#2

NAME: U.S.F.S. PLUMAS NATIONAL FOREST
ADDRESS: LAUFMAN RANGER STATION
CITY: MILFORD, CALIFORNIA 96121

LABORATORY NO: 11268
DATE SUBMITTED: 3/7/86
DATE REPORTED: 4/5/86

WATER ANALYSIS REPORT

WATER SAMPLE TAKEN FROM COFFEE SINK

GROSS ALPHA RADIATION.....27 pCi/L (counting error ± 7.5)

RADIUM 226 RADIATION.....< 1 pCi/L (counting error ± 1)

RADIUM 228 RADIATION.....< 1 pCi/L (counting error ± 1)

URANIUM RADIATION..... 26 pCi/L (counting error ± 6.4)

These results were obtained by following standard laboratory procedures: the liability of the laboratory shall not exceed the amount paid for this report. Some of the analysis may have been referred to one or more licensed laboratories.

Carolyn N. Henrici
Laboratory Director

Sierra Cascade Water Laboratory

copy

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Mr. Stanley Laufman Ranger Station MIlford, CA 96121	Bottle #: Clients Date collected: 3/4/86 Time collected: 0900 Collected by: lab Location: station sink	Data of report: 3/24/86 Job number: 1116

	sample Id	sample Id	sample Id	sample Id	sample Id	sample Id
Gross Alpha	39.96 ±5.67	PCi/1				

comments

Composite sample from all water sources on line at that time (does not include vertical well)

Bill

Doug Arntz
25 7831
x188
8-9 morn

4/8. 0845

#4

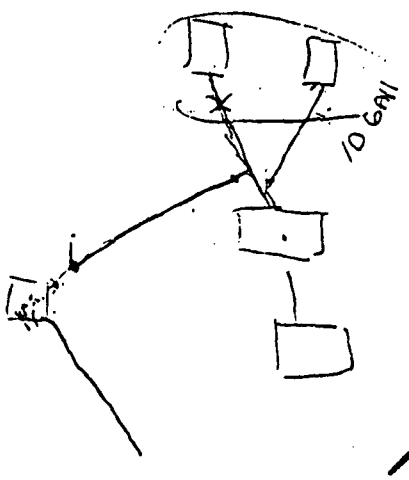
STATE TESTS TUES: 4-1-86
PRINCE, MANN, HALL, STANDEE STATE REP.

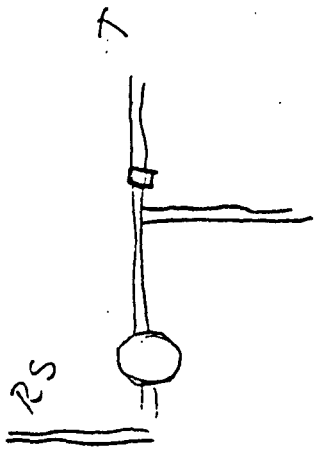
Tommy Wiseman Stat Health Dept.
Redding.

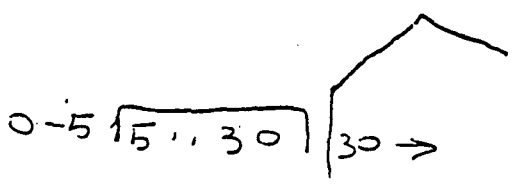
Results.

	grams alpha.	
Vertical coil	2.3	± 0.9
Horizontal coil	4.7	± 1.2
Rocker side spring	4.4	± 1.1
Top spring	25.3	± 2.6
Coffee can spring	35.9	± 3.1

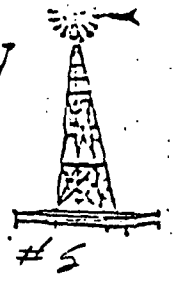
Can't use







Sierra Cascade Water Laboratory



CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford Ca	Bottle #: labs Date collected: 3/20/86 Time collected: 0930 Collected by: lab Location:	Date of report: 11/3/86 Job number: 1172

	sample Id Horizontal well	sample Id Vertical well	sample Id Road spring	sample Id	sample Id	sample Id
Gross Alpha	4.19±2.31	1.05±0.18	31.10±5.05			

comments

All values in pCi/L

Sierra Cascade Water Laboratory

#6

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford CA	Bottle #: clients Date collected: 4/29/86 Time collected: Collected by: client Location: Road Spring	Date of report: 6/3/86 Job number: 1267

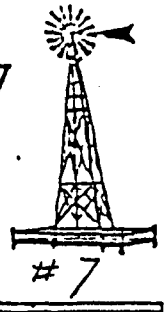
	sample Id	sample Id	sample Id	sample Id	sample Id	sample Id
Gross Alpha	0.00 ±1.02	PCi/l				

comments

Gross CPM less than background CPM

Sierra Cascade Water Laboratory

605 Richmond Rd.
Susanville, California 96130



CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station	Bottle #: clients Date collected: 4/15/86 Time collected: 0900 Collected by: lab Location: New Spring	Date of report: 5/5/86 Job number: 1238

GENERAL MINERALS

Constituent	Value (mg/l)	MCL *
Alkalinity		
bicarbonate	54	
carbonate	<1	
hydroxide	<1	
Calcium	13.6	
Chloride	1.5	250**
Copper	0.08	1.0
MBAS	<0.01	0.5
Iron	0.01	0.3
Magnesium	2.2	
Manganese	0.02	0.05
pH	7.36 units	5-9 unit#
Sodium	7	
Sulfate (S)	1.19	250**
Spec. cond.	105 umho	900umho**
TDS	113	500**
Hardness	43	
Zinc	<0.01	5.0

INORGANIC CHEMICALS

Constituent	Value (mg/l)	MCL *
Arsenic	<0.01	0.05
Barium	<0.1	1.0
Cadmium	<0.001	0.010
Chromium	0.01	0.05
Lead	0.008	0.05
Mercury	0.0003	0.002
Nitrate (N)	0.08	10
Selenium	<0.001	0.01
Silver	<0.01	0.05
Floride	0.08	1.4-2.4

BACTERIOLOGICAL

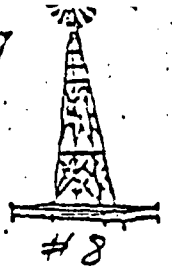
Analysis	MPN	MCL*
Total Coliform		<2.2
Fecal Coliform		
Fecal Strep.		

OTHER

Gross Alpha = 3.83 ±1.99 pCi/l
True Color = 4
Turbidity = 20 NTU
Odor = 1

* Maximum Contaminant Level established by Calif. Dept of Health (in mg/l)
** Recommended contaminant level established " " " " "
# Criterion for domestic uses established by the Environmental Protection Agency

Sierra Cascade Water Laboratory



CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford, CA	Bottle #: clients Date collected: 5/27/86 Time collected: Collected by: client Location:	Date of report: 6/6/86 Job number: 1350

	sample Id Coffee sink	sample Id Privy sink	sample Id	sample Id	sample Id	sample Id
Gross alpha PCi/1	3.73 ±1.74	1.32 ±1.11				

Comments

#9

SIERRA CASCADE WATER LABORATORY

605 RICHMOND RD. • SUSANVILLE, CA 96130 • (916) 257-7450

062496 1552

1439

LEAVE BLANK

SAMPLE FOR MICROBIOLOGICAL EXAMINATION

PURVEYOR AND ADDRESS	COUNTY	DATE AND HOUR COLLECTED
Laufman R.S	Lassen	6/24/96 - 1145
SAMPLING POINT	**COLLECTED BY**	**BOTTLE NUMBER**
Coffee Sink	M. Peterson	

TYPE OF SAMPLE: ☐ DRINKING WATER (ANY SOURCE) ☐ SEWAGE ☐ RAW SURFACE WATER ☐ OTHER (SPECIFY)

SEND REPORT TO:

ANALYSES DESIRED AND REMARKS:

☑ COLIFORM ☐ FECAL COLIFORM ☐ SPC ☐ OTHER

RESULTS (TO BE FILLED IN BY LABORATORY ONLY)

		10	1.0	.1
TUBE NUMBER OR PORTIONS				
PORTIONS IN ML.		1.0	1.0	1.0
PRESUMPTIVE TEST	24 HOURS	-	-	-
	48	-	-	-
CONFIRMED TEST	24			
	48			
E. C.	24			

COLIFORM MPN/100ml: <2.2

E. C. MPN/100ml:

SPC. ml AT 35° C.:

Cl₂ RES. mg/liter:

LABORATORY REMARKS

☐ LEAKED IN TRANSIT
☐ INSUFFICIENT SAMPLE

ANALYST: KP

SIERRA CASCADE WATER LABORATORY

605 RICHMOND RD. • SUSANVILLE, CA 96130 • (916) 257-7450

070196 - 1440

1454

LEAVE BLANK

SAMPLE FOR MICROBIOLOGICAL EXAMINATION

PURVEYOR AND ADDRESS	COUNTY	DATE AND HOUR COLLECTED
Laufman R.S.	Lassen	7-1-96 1100
SAMPLING POINT	**COLLECTED BY**	**BOTTLE NUMBER**
Coffee Sink	M. Peterson	

TYPE OF SAMPLE: ☑ DRINKING WATER (ANY SOURCE) ☐ SEWAGE ☐ RAW SURFACE WATER ☐ OTHER (SPECIFY)

SEND REPORT TO:

ANALYSES DESIRED AND REMARKS:

☑ COLIFORM ☐ FECAL COLIFORM ☐ SPC ☐ OTHER

RESULTS (TO BE FILLED IN BY LABORATORY ONLY)

		10	1.0	.1
TUBE NUMBER OR PORTIONS		5/0	4/0	
PORTIONS IN ML.		1.0	1.0	1.0
PRESUMPTIVE TEST	24 HOURS	-	-	-
	48	-	-	-
CONFIRMED TEST	24			
	48			
E. C.	24			

COLIFORM MPN/100ml: 23.2

E. C. MPN/100ml:

SPC. ml AT 35° C.:

Cl₂ RES. mg/liter:

LABORATORY REMARKS

☐ LEAKED IN TRANSIT
☐ INSUFFICIENT SAMPLE

ANALYST: KP

Sierra Cascade Water Laboratory

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger station	Bottle #: labs Date collected: 7/22/86 Time collected: 0900 Collected by: lab Location: upper spring (Sup)	Date of report: 8/11/86 Job number: 1513

	sample Id	sample Id	sample Id	sample Id	sample Id	sample Id
Gross Alpha	10.80 ±2.90 PCi/1		Data out of Control			

comments

Sierra Cascade Water Laboratory

#11

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station	Bottle #: labs Date collected: 9/16/86 Time collected: 0930 Collected by: lab Location: coffee sink	Date of report: 10/6/86 Job number: 5146

	sample Id	sample Id	sample Id	sample Id	sample Id	sample Id
Gross Alpha	1.50 ±1	38 PCi/l				

comments

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received 4-2-86 Leave Blank | Lab. No. 5795 RLH

Name and Address of Owner or Source: REDDING, JEB. LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15732 MLK

Sampling Point: VERTICAL WELL | County: LASSEN | Date and Time Collected: 4-1-86 1320

Type of Sample:
- ☐ Air (010)
- ☐ Fallout (030)
- ☐ Rain (110)
- ☒ Raw Water (160)
- ☐ Treated Water (170)
- ☐ Sewage Sludge (220)
- ☐ Sewage Effluent (210)
- ☐ Diet Study (700)
- ☐ Liquid Milk (710)
- ☐ Powdered Milk (711)
- ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)	
Air: Finish ____ Start ____ Net ____ M^3	Finish / Start	2.3 ± 0.9 pCi/L Alpha ____ pCi/____ Gross Beta ____ pCi/____ Net Beta *
Rainfall (Snow) ____ Total liters ____ Total Inches	Finish / Start	
Composite Sample:	Finish / Start	4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV. 4-76)

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received 4/2/86 Leave Blank | Lab. No. 5796

Name and Address of Owner or Source: REDDING, JEB. LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15733

Sampling Point: HORIZONTAL WELL | County: LASSEN | Date and Time Collected: 4/1/86 1330

Type of Sample:
- ☐ Air (010)
- ☐ Fallout (030)
- ☐ Rain (110)
- ☒ Raw Water (160)
- ☐ Treated Water (170)
- ☐ Sewage Sludge (220)
- ☐ Sewage Effluent (210)
- ☐ Diet Study (700)
- ☐ Liquid Milk (710)
- ☐ Powdered Milk (711)
- ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)	
Air: Finish ____ Start ____ Net ____ M^3	Finish / Start	4.7 ± 1.2 pCi/L Alpha ____ pCi/____ Gross Beta ____ pCi/____ Net Beta * 2.0 ± 0.2 ; Uranium pCi/L
Rainfall (Snow) ____ Total liters ____ Total inches	Finish / Start	
Composite Sample:	Finish / Start	4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV. 4-76)

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received ____ Leave Blank | Lab. No. 5797

Name and Address of Owner or Source: REDDING SEB... LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15734

Sampling Point: ROAD SPRING | County: LASSEN | Date and Time Collected: 4/1/86 1545

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220) ☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)	
Air: Finish ____ Start ____ Net ____ M^3	Finish / Start	4.4 ± 1.1 pc/ ____ ; Alpha pCi/l
Rainfall (Snow) ____ Total liters ____ Total inches	Finish / Start	____ pc/ ____ ; Gross Beta
Composite Sample:	Finish / Start	____ pc/ ____ ; Net Beta *
		3.3 ± 0.3 ; Uranium pCi/l
		4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 603 (REV. 4-76) ©1

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received 4/2/86 Leave Blank | Lab. No. 5795

Name and Address of Owner or Source: REDDING SEB... LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15735

Sampling Point: TOP SPRING | County: LASSEN | Date and Time Collected: 4/1/86 1530

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220) ☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)	
Air: Finish ____ Start ____ Net ____ M^3	Finish / Start	25.3 ± 2.6 pc/ ____ ; Alpha pCi/l
Rainfall (Snow) ____ Total liters ____ Total inches	Finish / Start	____ pc/ ____ ; Gross Beta
Composite Sample:	Finish / Start	____ pc/ ____ ; Net Beta *
		13.5 ± 1.4 ; Uranium pCi/l
		1.3 ± 0.3 ; Ta Radium pCi/l
		4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 603 (REV. 4-76) ©1

STATE OF CALIFORNIA • DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received: 4/5/[illegible]
Lab. No.: 5799

Name and Address of Sampler or Source: REDDING [illegible] LAUFMAN RANGER STATION
Collected By: HINRICHS
Serial Number: R 15736

Sampling Point: OFFICE AREA SINK
County: LASSEN
Date and Time Collected: 4/1/[illegible]

Type of Sample:
- [ ] Air (010)
- [ ] Fallout (030)
- [ ] Rain (110)
- [x] Raw Water (160)
- [ ] Treated Water (120)
- [ ] Sewage Sludge (230)
- [ ] Sewage Effluent (210)
- [ ] Diet Study (700)
- [ ] Liquid Milk (710)
- [ ] Powdered Milk (711)
- [ ] Other (Specify)

Sample Size	Collection Period (Date and Time)
Air: Finish / Start / Net	Finish / Start
Rainfall (Gauge) / Total liters / Total inches	Finish / Start
Composite Samples	Finish / Start

35 [illegible] Alpha pCi/l
Gross Beta
Net Beta
[illegible] Uranium pCi/l
[illegible] Radium [illegible] pCi/l

[illegible]

* Net Beta = Gross Beta minus K-40 Beta

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received 4-2-86 | Lab. No. 5795 RLH | Leave Blank

Name and Address of Owner or Source: REDDING JEB LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15732 MLK

Sampling Point: VERTICAL WELL | County: LASSEN | Date and Time Collected: 4-1-86 1300

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220) ☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)
Air Filter: Start ____ Finish ____ Net ____ M^3	Finish ____ Start ____
Rainfall (Snow): ____ Total liters ____ Total inches	Finish ____ Start ____
Composite Sample:	Finish ____ Start ____

2.3 ± 0.9 Alpha pCi/L
____ pCi/____ Gross Beta
____ pCi/____ Net Beta *

4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV 4-76) ©

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received 4/2/86 | Lab. No. 5796 | Leave Blank

Name and Address of Owner or Source: REDDING JEB LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15733

Sampling Point: HORIZONTAL WELL | County: LASSEN | Date and Time Collected: 4/1/86 1330

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220) ☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)
Air Filter: Start ____ Finish ____ Net ____ M^3	Finish ____ Start ____
Rainfall (Snow): ____ Total liters ____ Total inches	Finish ____ Start ____
Composite Sample:	Finish ____ Start ____

4.7 ± 1.2 Alpha pCi/L
____ pCi/____ Gross Beta
____ pCi/____ Net Beta *

2.0 ± 0.2 Uranium pCi/L

4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV 4-76) ©

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received / Leave Blank | Lab. No. 5797

Name and Address of Owner or Source: REDDING SEB.; LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15734

Sampling Point: ROAD SPRING | County: LASSEN | Date and Time Collected: 4/1/86 1545

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220)
☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

Sample Size	Collection Period (Date and Time)
Air Filter: Start ____ Finish ____ Net ____ M^3	Finish / Start
Rainfall (Snow) ____ Total liters ____ Total inches	Finish / Start
Composite Sample:	Finish / Start

4.4 ± 1.1 pCi/L Alpha
____ ± ____ pCi/L Gross Beta
____ ± ____ pCi/L Net Beta*
3.3 ± 0.3 Uranium pCi/L

4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV. 4-76) (R) 1

STATE OF CALIFORNIA - DEPARTMENT OF HEALTH
SANITATION AND RADIATION LABORATORY
SAMPLE FOR RADIOLOGICAL ANALYSIS

Date Received / Leave Blank | Lab. No. 5798

Name and Address of Owner or Source: REDDING SEB.; LAUFMAN RANGER STATION | Collected By: HINRICHS | Serial Number: R 15735

Sampling Point: TOP SPRING | County: LASSEN | Date and Time Collected: 4/1/86 1530

Type of Sample: ☐ Air (010) ☐ Fallout (030) ☐ Rain (110) ☒ Raw Water (160) ☐ Treated Water (170) ☐ Sewage Sludge (220)
☐ Sewage Effluent (210) ☐ Diet Study (700) ☐ Liquid Milk (710) ☐ Powdered Milk (711) ☐ Other (Specify)

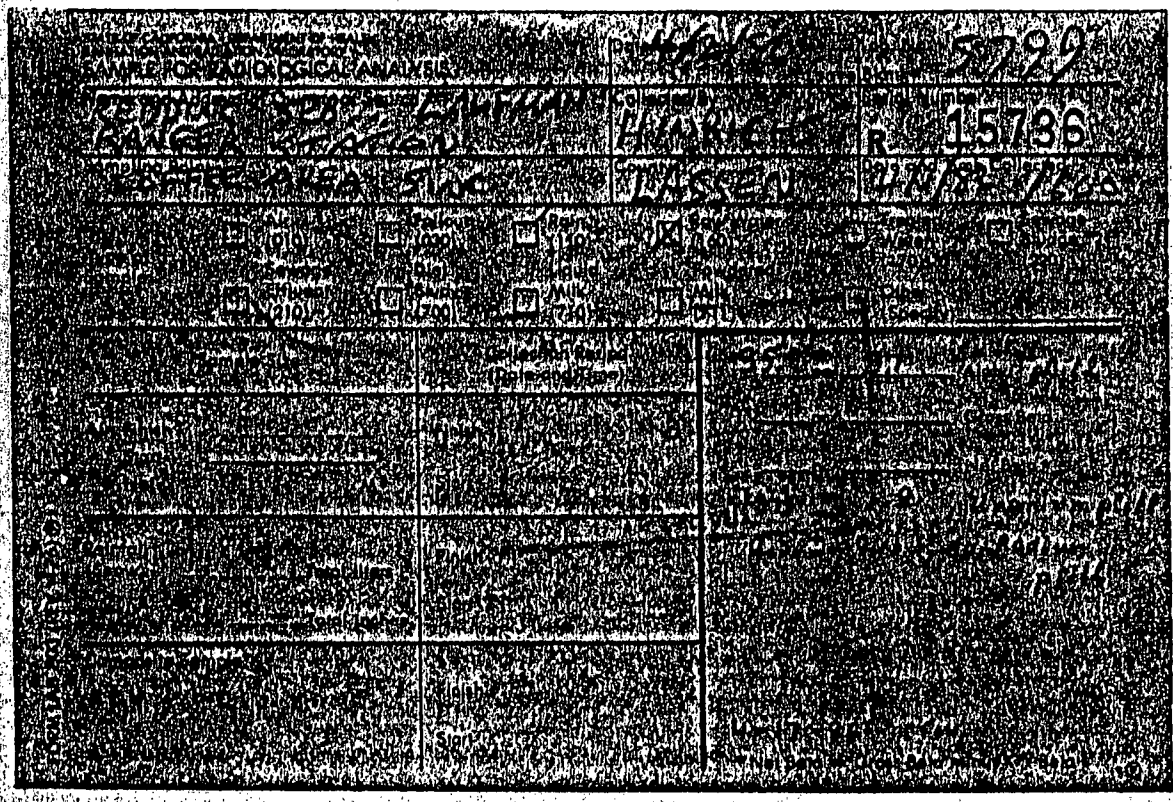
Sample Size	Collection Period (Date and Time)
Air Filter: Start ____ Finish ____ Net ____ M^3	Finish / Start
Rainfall (Snow) ____ Total liters ____ Total inches	Finish / Start
Composite Sample:	Finish / Start

25.3 ± 2.6 pCi/L Alpha
____ ± ____ pCi/L Gross Beta
____ ± ____ pCi/L Net Beta*
13.5 ± 1.4 Uranium pCi/L
1.3 ± 0.3 Ra Radium pCi/L

4-17-86 CTW

* Net Beta = Gross Beta minus K^{40} Beta

FORM LAB 803 (REV. 4-76) (R) 1



SAMPLING FOR NATURAL RADIOACTIVITY

Who?

All large and small community and noncommunity/nontransient systems.

When?

Four consecutive quarterly samples every four years.

What?

Radium 226 and radium 228 must be monitored. A set of four consecutive quarterly gross alpha samples may be substituted for measurements of radium 226 and radium 228. If gross alpha samples are used, all sources found to be containing an average gross alpha of greater than 5 pCi/L must determine the average quarterly radium 226 and radium 228 concentrations. This can be accomplished by specific analysis for radium 226 and radium 228 or by uranium analysis that confirm uranium to be the source of the gross alpha activity (see flow chart — Attachment 4).

A follow-up monitoring program must be established for sources with greater than 5 pCi/L gross alpha activity. This is necessary to assure that changes in hydrologic conditions do not adversely affect the radiological water quality. These sources should be sampled for gross alpha activity at least once annually with the sample taken during the quarter determined to coincide with the highest gross alpha activity. Sources found to contain uranium at or near the MCL should be monitored quarterly. Gross alpha monitoring can be substituted for uranium only after a firm correlation between uranium and the gross alpha particle activity has been established.

What are the MCLs?

1.	Gross alpha activity (including radium 226, but excluding radon and uranium)	15 pCi/L
2.	Combined radium 226 and radium 228	5 pCi/L
3.	Uranium	20 pCi/L

Additional clarification concerning sampling protocol and compliance determination:

1. Compliance with the MCLs shall be based on the average of the analysis of four consecutive quarterly samples.

2. Each water supplier shall plan and schedule the sampling of every water source. The goal is to complete the sampling within one year. After all of the sources have been sampled, the supplier should repeat the required consecutive quarterly sampling of 25 percent of the sources annually and not wait four years to commence the repeat sampling. This will provide information on changes at an earlier date and simplify budgeting for the supplier.

3. A well that exceeds 5 pCi/L gross alpha activity plus the error term is not violating an MCL unless:

   a. Samples taken from the well confirm that combined radium 226 and radium 228 exceeds 5 pCi/L. (Data obtained to date indicates this is an extremely rare occurrence in California); or

   b. An attempt to isolate the source of the gross alpha activity has produced results with greater than 15 pCi/L of gross alpha activity which cannot be accounted for. To date the sampling performed by the Sanitation and Radiation Lab (SRL) has been able to determine the source of the gross alpha activity. After the radionuclide responsible for the alpha activity (usually uranium) has been identified the appropriate AL or MCL for that radionuclide shall be used to determine compliance.

4. Concern of the ± error factor as it relates to determining compliance is not of great importance unless the analysis has confirmed combined radium 226 and radium 228 is equal to or greater than 5 pCi/L or the unaccounted for gross alpha activity (total gross alpha minus the error term minus uranium, radon, and other alpha particle emitters plus their error term) is equal to or greater than 15 pCi/L. Additional information concerning calculation of the ± error is provided on Attachment 5.

5. Conventional gross alpha collection and analysis techniques together with the normal transit and storage time between collection and analysis are such that the radon alpha particle activity is not included in results reported to water purveyors or health officials. This is due to radon's volatility and half life. During the analysis for alpha particle activity the sample is dried thereby releasing the radon.

6. At present only SRL and TMA (Richmond) are approved for both the EPA stipulated fluorometric and radiometric methods for uranium. Fruit Growers Laboratory (Santa Paula) is approved for the radiometric method only. The SRL is currently using a second fluorometric method to determine uranium concentrations. An attempt to have this method accepted by EPA will be made.

7. The appended Bodfish radon notification (Attachment 6) provides additional background information on the health effects of radon in air and water.

8. Additional guidance or compliance with the uranium MCL is as follows:

   a. All applicable systems which have sources that have not been sampled for radionuclides must initiate sampling within one year.

   b. Any system which has sampled for radionuclides in which the gross alpha exceeded 5 pCi/L and which did not analyze for uranium must sample for uranium within one year.

c. Other systems (i.e., those that sample and gross alpha was less than 5 pCi/L) can be assumed to be in compliance.

9. Accurate correlation between gross alpha and uranium can only be made if each quarterly sample is analyzed from the same sample.

SAMPLING FOR MAN-MADE RADIOACTIVITY

Who?

All suppliers using surface water sources and who are serving a population of over 100,000 (30,000 service connections).

When?

Four consecutive quarterly samples every four years.

What?

The surface water supplies must be sampled for:

1. Gross Beta
2. Tritium
3. Strontium-90
4. If gross beta is >50 pCi/L, then the major radioactive constituent must be identified and the appropriate total body dose shall be calculated. (It is the responsibility of the water supplier to see that this is done.)

What are the MCLs?

The four MCLs are listed below:

1. The average concentration of beta particle activity and photon radioactivity from man-made radionuclides in water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirems/year.
2. Gross beta -- 50 pCi/L
3. Strontium-90 -- 8 pCi/L
4. Tritum -- 20,000 pCi/L

Compliance with the MCLs shall be based on the average of the analysis of four consecutive quarterly samples.

RADIOACTIVITY SAMPLING PROTOCOL

Standard Sample

500 ml

Standard Sample Container

500 ml polyethylene bottle.

Standard Sampling Procedures

Collect a representative water sample and completely fill the sample bottle. Add concentrated nitric acid (HNO_3), 2 ml per 500 ml sample. This should stabilize the sample for at least a year. Refrigeration is not necessary.

Standard Frequency of Sampling

Once per quarter for the first year. After the first year, sampling and analysis shall be repeated every four years.

Analysis

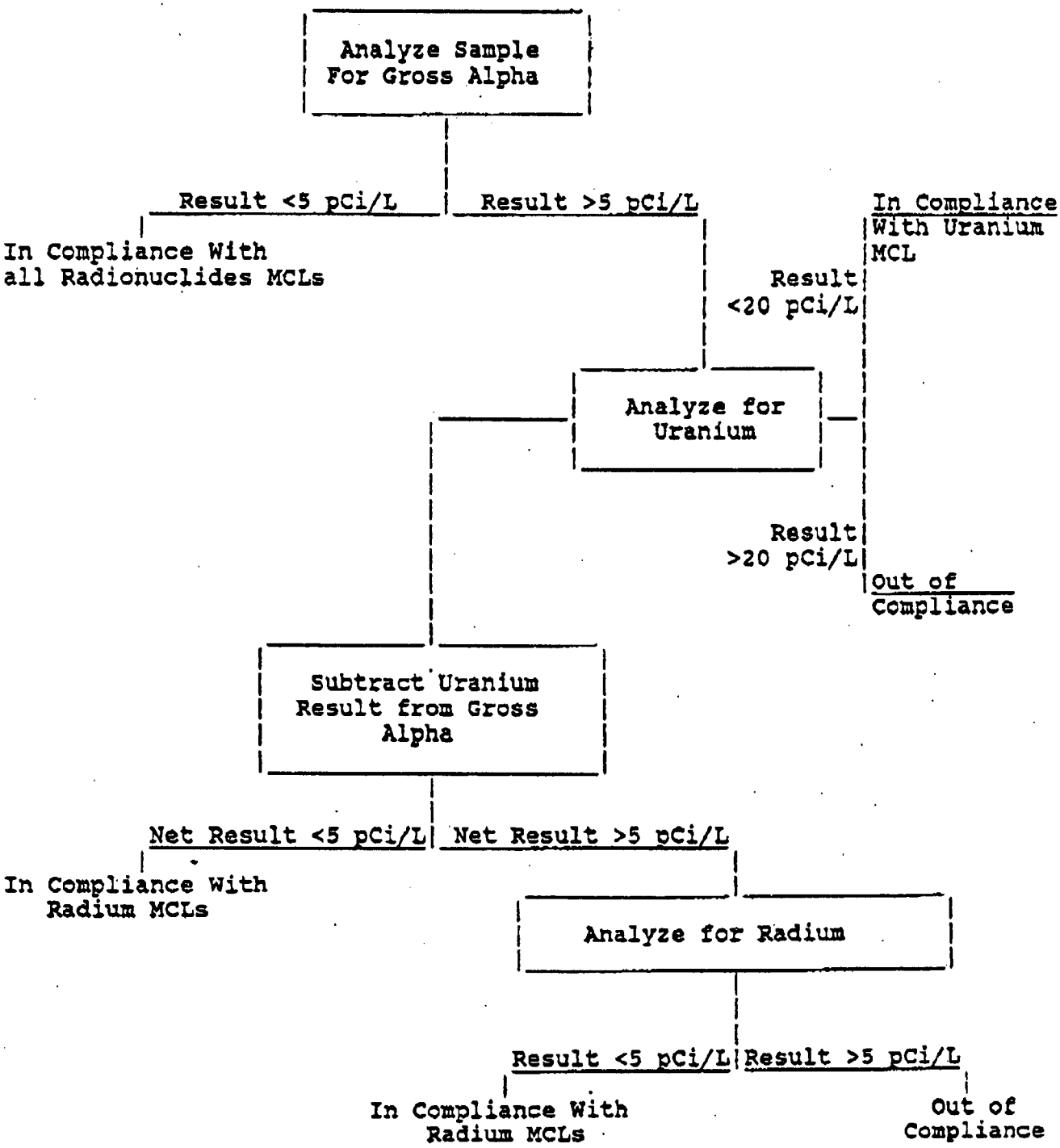
For the first year of sampling, small water systems in your county may choose to use one of the following methods:

1. The samples are collected and analyzed quarterly during a one year period and then averaged; or

2. The combination of the four quarterly samples can be analyzed as one composite sample.

If the results of the gross alpha analysis exceed 5 pCi/L, a follow-up differentiation analysis should be conducted by a state approved laboratory for radium 226 and, if necessary, radium 228.

MCLs	pCi/L
Combined radium 226 and radium 228	5 pCi/L
Gross alpha particle activity (including radium 226, but excluding radon and uranium)	15 pCi/L


Analyze Sample For Gross Alpha
Result <5 pCi/L
Result >5 pCi/L
In Compliance With all Radionuclides MCLs
In Compliance With Uranium MCL
Result <20 pCi/L
Analyze for Uranium
Result >20 pCi/L
Out of Compliance
Subtract Uranium Result from Gross Alpha
Net Result <5 pCi/L
Net Result >5 pCi/L
In Compliance With Radium MCLs
Analyze for Radium
Result <5 pCi/L
Result >5 pCi/L
In Compliance With Radium MCLs
Out of Compliance

United States Department of Agriculture	Forest Service	Plumas National Forest	159 Lawrence Street P.O. Box 1500 Quincy, CA 95971

REPLY TO: 2800

June 2, 1987

Copy also filed in folder 102 Laufman 1/28/92 JC

SUBJECT: Geologic Assessment of Laufman Groundwater Situation

TO: District Ranger, Milford RD
thru: Bill Standlee

On May 7, 1987, I met with Bill Standlee and Art Prince to look for solutions to the Laufman contaminated water system problem. Bill showed us the various known springs and water development components. I studied the air photos and we discussed what could be readily observed and interpreted on the geology of the area. I reviewed with Art some of the test data from recent water samples.

Some key information and observations

The top spring (old development) has radioactive levels from two to 40 (and more) times higher than all the other sources currently being sampled. It is currently disconnected from the water system.

The vertical well (adjacent to the campground) has the lowest radioactive count of any of the sites being monitored (some samples show zero gross alpha count). However, it has a manganese level averaging 70 times more than the allowable "maximum contaminant level." It is currently disconnected from the water system, although can be easily reconnected.

The new spring has relatively low radioactive levels, but appears to be drying up. This spring has not yet been developed. It emits just below a high, 3-dimensionally jointed granitic outcrop on a convex (ridge-like) slope that normally would not be a prime candidate for an aquifer. If flow fluctuates seasonally or irradically, the water source is probably influenced heavily by intermittent precipitation, and would not be a good candidate to develop as a long term source.

The horizontal well, just above the campground, has been plugging lately and needs to be re-opened again (if continued use is anticipated) with a high pressure water injection treatment.

The "road spring" has the second highest level of radioactive contamination of those sources being monitored. The near-surface spring water catchment system is not capturing all the available water (some is draining into the ditch) and biological contaminants appear to be getting into the water.

Other opportunities exist within the watershed above Laufman PS to develop water sources. A vertical well at about 5700 feet in the main draw of "East Canyon" apparently provided large volumes of water in the past to a now dormant mining operation. Various other bogs and springs indicate the

potential for water developments. At this time however, the quality and quantity of water at those sites is not known.

A basic assumption I'm making is that radioactive contamination of the Ranger Station and Campground water is more of a hazard than mineral (eg. manganese) contamination. Given that, emphasis should be on using/developing both short term (to meet this summer's needs) and long term water sources that have very low or zero levels of radioactivity.

It should be noted that this brief review of the contamination situation by no means constitutes a thorough geologic investigation. Much more work on the ground, under the ground and in the lab would be needed to fully understand the source(s) of contamination, the relevant geology, and the aquifer characteristics which could then more reliably be interpreted to help select the best water source options. However, due to the urgency of the situation (water volume at the station diminishing rapidly, early dry summer anticipated and varying levels of radioactive contamination), I feel that some preliminary recommendations are in order.

Recommendations

1. The feasibility of installing a filter for manganese on the vertical well should be explored in detail by SO Engineering. If the manganese contamination can be controlled, the vertical well has many advantages over all other alternatives. In my opinion, maintenance of the filter should become a high priority assigned responsibility compared with the alternative of using other sources with higher radioactive counts.

2. Monitoring/testing of all sources which are currently being monitored should continue, in order to build up a better understanding of the trends of water quality at different locations within the watershed. In addition, water quantity estimates (eg., using a 5 gal. bucket and watch) should be made on a monthly basis (minimum) at each site. These records will help to determine the capacity and viability of the groundwater aquifer at each source.

3. A more thorough geotechnical study should be conducted of the groundwater regime and water sources within the watershed by the Forest Geologist. Feasibility of alternative sources should be analyzed and monitoring/testing of additional sites should begin. I might also get someone from Zone Minerals involved.

4. The District should begin monthly monitoring and testing of the vertical Mine well in East Canyon, after obtaining permission from the claimant. Favorable test results could lead to development of a new well in this area in the future to meet Forest Service needs.

Please let me know by June 11 if you would like to further discuss any of the above, and if you would like for me to implement recommendation number 3., as I will have very limited availability again until mid August.

ALLEN KING
Forest Geologist

United States Department of Agriculture | Forest Service | Plumas National Forest | Milford RD Milford, CA 96121

REPLY TO: 7420 Water Supply Date: Aug.7, 1987

SUBJECT: Laufman Water System

TO: All Ranger Station Residences

We have been able to clean up the Road Spring again. It is back on line again as of 8/5/87. Our tanks are full now. We can start watering our lawns again using the attached schedule.

For your iinformation the top spring, the one that has caused our problems with Gross Alpha counts, has gone down to 4.84 +/-2.04 pCi/l. This spring has been going down in counts since we started testing a year and half ago. With the count this low we are getting this water source ready to go back on the system if we need it. Before we put this on line we will let everyone know. Also we are going ahead with the filtering plant on the Horizontal Well.

I would like to thank everyone for their patience during this time of low water. If we can get the top spring ready to go for backup we should not have any more problems, I hope.

RESIDENCE	DAY OF WEEK	TIME OF DAY
BALLARD	1,3,5,7,9,11,13	0900 to 1300
DAVIS	2,4,6,8,10,12,14	1600 to 2000
MOHORIC	1,3,5,7,9,11,13	1700 to 1900
MCGRATH (SYSTEMS)	1,3,5,7,9,11,13	0300 to 0500
MOLINA	2,4,6,8,10,12,14,	1000 to 1400
STANDLEE (SYSTEMS)	1,3,5,7,9,11,13	2200 to 0300
WILLIAMS	2,4,6,8,10,12,14	1700 to 1900
OFFICE (SYSTEMS)	2,4,6,8,10,12,14	0200 to 0500

Week 1							Week 2						
Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
1	2	3	4	5	6	7	8	9	10	11	12	13	14

/s/ Bill Standlee
BILL STANDLEE
District Fire Management Officer

530 257-8183

LASSEN COUNTY
HEALTH and HUMAN SERVICES DEPARTMENT

EXHIBIT 2

☐ Alcohol & Drug ☐ Mental Health ☐ Public Guardian ☒ Public Health ☐ Veterans Service ☐ Welfare

Ray C. Grammer
Administrator

E. Paul Smith, D.P.A.
Program Director

April 21, 1986

Plumas National Forest
Milford Ranger District
Milford, California 96121

Attention: Bill Standlee

Dear Bill:

The purpose of this correspondence is to put in writing what was discussed over the phone on April 14, 1986 so that there will be no misunderstanding of what the Lassen County Health Department wants done as the next steps in dealing with the radiological contamination of your water system.

Please proceed as follows:

(1) Take the top spring out of service by disconnecting its water supply pipe close to the spring, cap the downhill supply pipe but allow the spring to drain to waste. Do not stop the normal spring flow.

(2) Disconnect the top spring supply pipe at its junction with the horizontal spring pipe and cap the top spring supply pipe. We do not want an open ended dead line.

(3) The roadside spring is to be water back-flushed then it is to be allowed to flow to the creek for three days before you resample for gross alpha. Please see that the Health Department receives the test results and that we approve them before proceeding with any further action.

(4) If the roadside spring is found to be safe for use as drinking water it and the horizontal spring are to be used to flush out the concrete storage tank. While this is being done the 20,000 gallon steel tank is to supply the ranger station and dwellings with water (not for drinking). Bottled water is to be used for drinking.

(5) Flush the steel storage tank with water from the roadside spring and horizontal well. Refill the steel tank.

(6) Sample the pooled water from at least two different locations at the ranger station complex. One source is to be the coffee area in the ranger station.

(7) When the Health Department has received the results and has cleared the water supply for human consumption normal use of the water system can commence. Bottled drinking water may then be discontinued.

Some additional things to be done:

(1) If a new spring is to be developed it is to be sampled to see that the water meets all the State primary and secondary drinking water standards and radiological standards before development can begin. This office is to approve the method of development.

(2) Supply the Health Department with a schematic drawing of the entire Laufman water system including its various connections and valving.

Thank you for your continued cooperation during this lengthy investigation.

Sincerely,

Doug Ames
Sanitarian

DA/dw

cc: Plumas National Forest
Art Prince

State of California—Health and Welfare Agency

WATER SYSTEM INSPECTION REPORT

Department of Health Services

NAME [illegible]	DATE [illegible]
LOCATION [illegible]	RECHECK DATE
MAILING ADDRESS [illegible], Quincy [illegible]	COMPUTER NUMBER
OWNER/OPERATOR [illegible]	TIME IN
PROGRAM/ELEMENT / SERVICE	TIME OUT

Section	Item	MAJOR	MINOR
SOURCE PROT	Sewage	1	
SOURCE PROT	Activity	2	3
SOURCE PROT	Flooding	4	5
SOURCE PROT	Construction	6	7
SOURCE PROT	Location	8	9
SOURCE TREAT	Disinfection	10	
SOURCE TREAT	Filtration	11	12
SOURCE TREAT	Treatment Other	13	14
DISTRIB PROT	Storage	15	16
DISTRIB PROT	Piping	17	18
DISTRIB PROT	Cross-Con. Problem	19	
OPER	Equip. Maint.	20	21
OPER	Records		22
OPER	No Operator	23	24
OPER	Cross-Con. Program	25	26
SAMPLING – BACTERIOLOGICAL	Number of Samples Insuff. < 4 Samp.	27	
SAMPLING – BACTERIOLOGICAL	Number of Samples Insuff. 4-8 Samp.	28	
SAMPLING – BACTERIOLOGICAL	Number of Samples Insuff. > 8 Samp.	29	
SAMPLING – BACTERIOLOGICAL	Std. Not Met For < 4 Mo.	30	
SAMPLING – BACTERIOLOGICAL	Std. Not Met For 4-8 Mo.	31	
SAMPLING – BACTERIOLOGICAL	Std. Not Met For > 8 Mo.	32	
SAMPLING – BACTERIOLOGICAL	Pub. Notification Bact.	33	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Insuff.	34	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Nitrate	35	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Selenium	36	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Fluoride	37	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Mercury	38	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Arsenic	39	
SAMPLING – PRIMARY CHEMISTRY	Inorg. Std. Not Met Other	40	
SAMPLING – PRIMARY CHEMISTRY	Pub. Notification Inorg.	41	
SAMPLING – PRIMARY CHEMISTRY	Org. Insuff.	42	
SAMPLING – PRIMARY CHEMISTRY	Org. Std. Not Met Required	43	
SAMPLING – PRIMARY CHEMISTRY	Org. Std. Not Met Other	44	
SAMPLING – PRIMARY CHEMISTRY	Pub. Notification Org.	45	
SAMPLING – SECD	Secd. Chem. Insuff.	46	
SAMPLING – SECD	Secd. Chem. Std. Not Met	47	
SAMPLING – SECD	Consumer Acceptance Not Met	48	
SAMPLING – TURB	Turb. Insuff. Chronic	49	
SAMPLING – TURB	Turb. Insuff. Interm.	50	
SAMPLING – TURB	Turb. Std. Not Met Interm.	51	
SAMPLING – TURB	Turb. Std. Not Met Chronic	52	
SAMPLING – TURB	Pub. Notification Turb.	53	
	Permit None Valid	54	
QUANT.	Source	55	
QUANT.	Storage	56	
QUANT.	Distribution	57	
	Safety Inadequate	58	

SYSTEM STATUS: (MARK ONE)

59 MAJOR DEF. ☐ 60 MINOR DEF. ☐ 61 NO DEF. ☐

The marked items represent Health Code violations and must be corrected as follows:

Provide records detailing water collection sites, storage and distribution. Provide details of connections - how many and to what types of buildings (residences, offices, barracks, e[illegible]. Provide records for average number of individuals served by this water system.

Disregard corrections required of inspection report dated [illegible]-84 for the top spring. It is to be disconnected from the system near the spring box so that the collected water leads to the natural drainage below. The piping is also to be disconnected where it [illegible] the rest of the system.

Any development for additional water for this system or any [illegible] in this system will [illegible] [illegible] department [illegible] to the [illegible] construction. Construction is not to begin unless approved by this department.

OFFICE ADDRESS AND PHONE NUMBER	
	RECEIVED BY:
	SANITARIAN:
	PAGE OF

DHS 8092 (5/84) Second Copy — Owner Third Copy — File

LASSEN COUNTY
HEALTH and HUMAN SERVICES DEPARTMENT

EXHIBIT 4

☐ Alcohol & Drug ☐ Mental Health ☐ Public Guardian ☐ Public Health ☐ Veterans Service ☐ Welfare

Ray C. Grammer
Administrator

E. Paul Smith, D.P.A.
Program Director

July 7, 1986

Plumas National Forest
Milford Ranger District
Milford, Ca. 96121

Attention: Bill Standlee

Dear Bill:

The results of the bacteriological water sample taken June 24, 1986 show no contamination. Your water system is hereby declared fit for human consumption and normal usage of it may resume.

Thanks again for your help and cooperation.

Sincerely,

Kenneth Korver, M.D.
Health Officer

Doug Ames
Sanitarian

DA/nmn

JUL - 8 1986

P. O. Box 1359 • Susanville, CA 96130 • (916) 257-8311

Sierra Cascade Water Laboratory

605 Richmond Rd.
Susanville, California 96130

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford, CA 96121	Bottle #: labs Date collected: 3/20/86 Time collected: 0930 Collected by: lab Location: horizontal well	Date of report: 4/7/86 Job number: 1172

GENERAL MINERALS

Constituent	Value (mg/l)	MCL *
Alkalinity		
bicarbonate	78	
carbonate	<1	
hydroxide	<1	
Calcium	24.8	
Chloride	1.0	250**
Copper	0.13	1.0
MBAS	<0.01	0.5
Iron	<0.01	0.3
Magnesium	3.9	
Manganese	0.01	0.05
pH	6.62 units	5-9 unit#
Sodium	8.9	
Sulfate (S)	<0.01	250**
Spec. cond.	170 umho	900umho**
TDS	155	500**
Hardness	76	
Zinc	0.01	5.0

INORGANIC CHEMICALS

Constituent	Value (mg/l)	MCL *
Arsenic	<0.01	0.05
Barium	<0.03	1.0
Cadmium	<0.001	0.010
Chromium	<0.001	0.05
Lead	0.011	0.05
Mercury	<0.001	0.002
Nitrate (N)	0.07	10
Selenium	<0.01	0.01
Silver	<0.01	0.05
Floride	0.08	1.4-2.4

BACTERIOLOGICAL

Analysis	MPN	MCL*
Total Coliform	<2.2	<2.2
Fecal Coliform		
Fecal Strep.		

OTHER

Color = 1 unit
Odor = no odor observed at 60°C
Turbidity = <1 NTU

$\bar{x}A = 4.19 \pm 2.31$

* Maximum Contaminant Level established by Calif. Dept of Health (in mg/l)
** Recommended contaminant level established " " " " "
# Criterion for domestic uses established by the Environmental Protection Agency

Sierra Cascade Water Laboratory

605 Richmond Rd.
Susanville, California 96130

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford CA	Bottle #: labs Date collected: 3/20/86 Time collected: 0930 Collected by: lab Location: vertical well	Date of report: 4/7/86 Job number: 1172

GENERAL MINERALS

Constituent	Value (mg/l)	MCL *
Alkalinity		
bicarbonate	130	
carbonate	<1	
hydroxide	<1	
Calcium	34.4	
Chloride	2.0	250**
Copper	0.13	1.0
MBAS	<0.01	0.5
Iron	2.8	0.3
Magnesium	10.7	
Manganese	2.1	0.05
pH	7.06 units	5-9 unit#
Sodium	11.0	
Sulfate (S)	<0.01	250**
Spec. cond.	270 umho	900umho**
TDS	198	500**
Hardness	116	
Zinc	0.04	5.0

INORGANIC CHEMICALS

Constituent	Value (mg/l)	MCL *
Arsenic	<0.01	0.05
Barium	<0.03	1.0
Cadmium	<0.001	0.010
Chromium	0.006	0.05
Lead	0.022	0.05
Mercury	<0.001	0.002
Nitrate (N)	2.0	10
Selenium	<0.01	0.01
Silver	<0.01	0.05
Floride	0.05	1.4-2.4

BACTERIOLOGICAL

Analysis	MPN	MCL*
Total Coliform	<2.2	<2.2
Fecal Coliform		
Fecal Strep.		

OTHER

Color = 50 units
Odor = 8 units at 60°C
Turbidity = 23 NTU

SA 1.05 +0.18

* Maximum Contaminant Level established by Calif. Dept of Health (in mg/l)
** Recommended contaminant level established " " " " "
# Criterion for domestic uses established by the Environmental Protection Agency

Sierra Cascade Water Laboratory

605 Richmond Rd.
Susanville, California 96130

CLIENT	SAMPLE IDENTIFICATION	LAB CONTROL DATA
Laufman Ranger Station Milford, CA 96121	Bottle #: labs Date collected: 3/20/86 Time collected: 0930 Collected by: lab Location: Road Spring	Date of report: 4/7/86 Job number: 1172

GENERAL MINERALS

Constituent	Value (mg/l)	MCL *
Alkalinity		
bicarbonate	74	
carbonate	<1	
hydroxide	<1	
Calcium	23.2	
Chloride	2.0	250**
Copper	0.09	1.0
MBAS	<0.01	0.5
Iron	<0.01	0.3
Magnesium	2.4	
Manganese	0.01	0.05
pH	6.86 units	5-9 unit#
Sodium	10.5	
Sulfate (S)	1.45	250**
Spec. cond.	160 umho	900umho**
TDS	144	500**
Hardness	68	
Zinc	0.01	5.0

INORGANIC CHEMICALS

Constituent	Value (mg/l)	MCL *
Arsenic	<0.01	0.05
Barium	<0.03	1.0
Cadmium	<0.001	0.010
Chromium	0.009	0.05
Lead	0.003	0.05
Mercury	<0.001	0.002
Nitrate (N)	0.03	10
Selenium	<0.01	0.01
Silver	<0.01	0.05
Floride	0.08	1.4-2.4

BACTERIOLOGICAL

Analysis	MPN	MCL*
Total Coliform	<2.2	<2.2
Fecal Coliform		
Fecal Strep.		

OTHER

Color = 1 unit
Odor = no odor observed at 60°C
Turbidity = <1 NTU

$\bar{y}.H = 31.10 \pm 5.15$

* Maximum Contaminant Level established by Calif. Dept of Health (in mg/l)
** Recommended contaminant level established " " " " "
# Criterion for domestic uses established by the Environmental Protection Agency

Monarch Laboratory

559 EAST LINDO AVENUE
PHONE (916) 345-7279
CHICO, CALIFORNIA 95926

May 18, 1977

District Ranger
Laufman Ranger Station
Milford, California 96121

" (Roadside Springs)
Porcupine Spring" at Laufman R. S.

Silver (Ag)	0.029 ppm	Endrin	< 0.0001 ppm
Arsenic (As)	0.018 ppm	Lindane	< 0.00005 ppm
Barium (Ba)	0.145 ppm	Methoxychlor	< 0.0005 ppm
Cadmium (Cd)	0.003 ppm	Toxaphene	< 0.001 ppm
Chromium (Cr)	0.04 ppm	2,4-D	< 0.0005 ppm
Fluoride (Fl)	0.08 ppm	2,4,5-TP (Silvex)	< 0.0002 ppm
Mercury (Hg)	< 0.001 ppm		
Nitrate (NO_3)	0.12 ppm		
Selenium (Se)	0.002 ppm		

MILFORD RD
DR
RD
R. CON.
MAY 23 1977
FILE DISCARD

Richard E. Hemici

CRANMER ENGINEERING INC.
Consulting Engineers
188 EAST MAIN ST.
P.O. BOX 943
GRASS VALLEY, CA 95945
(916) 273-7284

LABORATORY REPORT

SAMPLING LOCATION: _____
COLLECTED BY: _____

DATE REPORTED 10/10/75
DATE RECEIVED 9/15/75
Lab. No. 75614-5

U. S. Forest Service
Laufman Ranger Station
Milford, CA. 96121

100 SAMPLE

LAUFMAN RANGER STATION

	MG/L		MG/L
Arsenic, As	.002	Calcium, Ca	36.4
Cadmium, Cd	<.001	Barium, Ba	.07
Chromium, Cr.	.004	Chloride, Cl	2.7
Cyanide, CN	<.01	Copper, Cu	.261
Methylene Blue Active Substances, M.B.A.S.	<.01	Fluoride, F	.15
Iron, Fe	.043	Lead, Pb	.011
Manganese, Mn	.002	Mercury, Hg	<.001
Nitrate, as N	.12	Selenium, Se	<.01
* Silver, Ag	0.270*	Sodium, Na	11.2
Sulfate, SO_4	4.1	Zinc, Zn	.004
Hardness, as $CaCO_3$	61.1	Alkalinity, HCO_3	118.3
pH @ 22° C	7.5	Saturation pH (pH_s)	8.18
		Saturation Index @ 70° F	−.68

* Rerun to verify result.

CRANMER ENGINEERING, INC.
BY Harry H Bailey
Harry H. Bailey

Henrici Water Laboratory

1832 Butterfly Valley Road Quincy, California 95971
Phone: (916) 281-6588

NAME: US.FS. PLUMAS NATIONAL FOREST LAB # 2663

ADDRESS: LAUFMAN RANGER STATION DATE SUBMITTED: 4/6/82

CITY: MILFORD, CALIFORNIA 96121 DATE REPORTED: 4/30/82

MUST BE SPRING AS WELL WAS NOT DRILLED UNTIL 5/82

GENERAL MINERAL		INORGANIC CHEMICAL	
pH	7.2	ARSENIC mg/l	< 0.05
SPECIFIC DONDUCTANCE	240	BARIUM mg/l	< 1.0
TOTAL DISOLVED SOLIDS mg/l	173	CADMIUM mg/l	< 0.009
TOTAL HARDNESS mg/l as $CaCO_3$	70	CHROMIUM mg/l	< 0.05
TOTAL ALKALINITY mg/l as $CaCO_3$	99	FLUORIDE mg/l	0.1
BICARBONATE mg/l	121	LEAD mg/l	< 0.05
CARBONATE mg/l	< 1.0	MERCURY mg/l	< 0.002
CHLORIDE mg/l	8.7	NITRATE mg/l	1.6
SULFATE mg/l	< 1.0	SELENIUM mg/l	< 0.01
CALCIUM mg/l	20	SILVER mg/l	< 0.05
COPPER mg/l	0.3		
IRON mg/l	< 0.01		
POTASSIUM mg/l	1.9		
MAGNESIUM mg/l	4.6		
MANGANESE mg/l	< 0.05	GENERAL PHYSICAL	
SODIUM mg/l	15	COLOR units	
ZINC mg/l	0.30	ODOR tons	
FOAMING AGENT mg/l (LAS)	< 0.05	TURBIDITY units	

< means less than the listed value

These results were obtained by following standard laboratory procedures: the liability of the laboratory shall not exceed the amount paid for this report. Some of the analysis may have been referred to one or more licensed laboratories.

SIGNED: R. E. Henrici

CH2M HILL
ENVIRONMENTAL LABORATORY
2218 RAILROAD AVENUE, P.O. BOX 2088
REDDING, CA 96001—TELEPHONE (916) 243-5831

REF. NO. 7849
DATE 6/8/82

Physical
Chemical &
Bacteriological
Analysis

ANALYSIS

REPORT TO LES CUSHMAN
P.O. Box 3251
Redding, Ca. 96049

ATTN: Les Cushman PHONE: 221-4408

SAMPLE DESCRIPTION Lauffman R.D. - Well Water SAMPLED BY: Les

DATE OF SAMPLE 5/28/82 DATE RECEIVED 6/1/82

MAJOR CATIONS	milligrams per liter	milli-equivalents per liter
Calcium (Ca)	27.1	
Magnesium (Mg)	6.73	
Potassium (K)		
Sodium (Na)	20.2	
total milli-equivalents per liter		
MAJOR ANIONS		
Bicarbonate (HCO_3)	166	
Carbonate (CO_3)	0	
Chloride (Cl)	5.2	
Nitrate (NO_3)	<0.22	
Phosphate (PO_4)		
Sulfate (SO_4)	10	
total milli-equivalents per liter		

TRACE ELEMENTS	milligrams per liter
Arsenic (As)	<0.005
Barium (Ba)	<0.1
Cadmium (Cd)	<0.01
Chromium (Cr) total	<0.02
Copper (Cu)	<0.02
Fluoride (F)	0.07
Iron (Fe)	0.31
Lead (Pb)	<0.05
Manganese (Mn)	1.56
Mercury (Hg)	<0.001
Selenium (Se)	<0.01
Silver (Ag)	<0.02
Zinc (Zn)	0.02
BACTERIA	MPN/100 ml
Total Coliform	
Fecal Coliform	

OTHER	milligrams per liter
Phenolphthalein Alkalinity ($CaCO_3$)	0
Methyl Orange (total) Alkalinity ($CaCO_3$)	136
Total Hardness ($CaCO_3$)	95.4
pH (units)	7.44
Electrical Conductivity (micromhos/cm @ 25°C)	268
Turbidity (NTU)	0.45
Color (units)	<5
Odor (units)	none
Total Dissolved Solids	153
MBAS	<0.05
PESTICIDES	
Endrin	
Lindane	
Methoxychlor	
Toxaphene	
2-4-D	
2-4-5-TP Silvex	

COMMENTS:

All analyses by EPA or State of California recommended methods, unless otherwise noted

State Approved Water Laboratory for Chemical, Bacteriological, and Bioassay Examinations

REPORTED BY: Jan Howley

The information shown on this sheet is test data only and no analysis or interpretation is intended or implied.

Form 121

Water Quality Samples for California

USGS 10356500 SUSAN R A SUSANVILLE CA

Available data for this site

Lassen County, California
Hydrologic Unit Code 18080003
Latitude 40°25'03", Longitude 120°40'15" NAD27
Drainage area 184.00 square miles

Output formats

- Parameter Group data summary
- Inventory of available water-quality data
- Inventory of water-quality data with retrieval
- Tab-separated ASCII file, serial order
- Tab-separated ASCII file, wide order
- Reselect output format

SAMPLE DATETIME	MEDIUM CODE	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
1973-03-15 08:05	9	≤ 20.			
1974-05-09 06:50	9	≤ 20.			
1975-03-19 16:35	9	≤ 20.			
1976-04-21 10:30	9	nd .0			
1977-05-03 15:05	9	≤ 20.			
1977-06-08 08:00	9	.04			
1978-05-16 09:00	9	≤ 20.			≤ .1
1978-08-15 10:00	9	40.			≤ .1
1978-11-22 09:30	9	50.			≤ .1
1979-02-14 09:30	9	20.			.3
1979-05-18 07:30	9	60.			≤ .1
1979-08-17 11:30	9	70.			≤ .1

1979-11-20 09:45	9	10.			.0
1980-03-11 11:10	9	20.			.0
1980-05-14 08:30	9	30.			.1
1980-08-13 09:30	9	60.			.0
1980-11-20 09:40	9	40.			.0
1981-01-20 08:45	9	10.			.1
1981-05-20 08:30	9	70.			3.
1981-09-23 09:00	9	30.			.0
1981-11-24 09:00	9	50.			.1
1982-01-18 15:30	9	300.			≤.1
1982-05-11 16:30	9	50.			.1
1982-09-21 15:45	9	10.			≤.1
1982-11-16 14:00	9		10.	6.	.1
1983-01-13 14:15	9		50.	8.	.1
1983-05-10 11:45	9		80.	7.	.2
1983-09-27 15:00	9		60.	6.	.1
1983-11-15 10:15	9		90.	12.	≤.1
1984-01-24 10:45	9		20.	6.	≤.1
1984-05-22 10:00	9		90.	5.	≤.1
1984-09-17 13:45	9		10.	7.	≤.1
1984-11-19 14:30	9		60.	≤4.	.2
1985-01-22 12:00	9		≤10.	≤4.	≤.1
1985-05-22 12:00	9		20.	≤4.	≤.1
1985-09-25 10:30	9		30.	≤4.	≤.1
1985-11-20 13:50	9		≤10.	≤4.	≤.1
1986-01-23 12:00	9		90.	≤4.	≤.1
1986-05-20 14:40	9		30.	≤4.	≤.1
1986-11-19 12:00	9		≤10.	≤4.	≤.1
1987-01-21 13:25	9		10.	4.	≤.1
1987-05-20 10:00	9		20.	≤4.	≤.1
1987-09-16 10:45	9		≤10.	≤4.	≤.1
1987-11-18 12:15	9		≤10.	≤4.	≤.1
1988-01-27 11:30	9		≤10.	≤4.	≤.1

1988-05-18 11:15	9		≤ 10.	≤ 4.	≤ .1
1988-09-14 13:15	9		≤ 10.	≤ 4.	≤ .1
1988-11-22 11:25	9		≤ 10.	≤ 4.	≤ .1
1989-01-25 11:15	9		≤ 10.	4.	≤ .1
1989-05-23 12:00	9		220.	≤ 4.	≤ .1

SAMPLE DATETIME	MEDIUM CODE	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
1989-09-19 11:30	9		10.	≤ 4.	≤ .1
1989-11-15 10:50	9		≤ 10.	≤ 4.	≤ .1
1990-01-24 11:30	9		20.	≤ 4.	≤ .1
1990-05-16 12:15	9		30.	≤ 4.	.1
1990-09-19 11:30	9		≤ 10.	≤ 4.	≤ .1
1990-11-15 10:40	9		≤ 10.	≤ 4.	≤ .1
1991-01-16 11:20	9		≤ 10.	≤ 4.	≤ .1
1991-05-14 08:30	9		80.	≤ 4.	≤ .1
1991-09-18 11:40	9		≤ 10.	≤ 4.	≤ .1
1991-11-20 11:10	9		≤ 10.	≤ 4.	
1992-01-29 10:45	9		≤ 10.	≤ 4.	
1992-05-27 12:15	9		≤ 10.	≤ 4.	
1992-09-16 13:20	9		≤ 10.	≤ 4.	
1992-11-18 13:00	9		≤ 10.	≤ 4.	
1993-01-26 11:20	9		87.	≤ 4.	
1993-05-12 12:15	9		60.	≤ 4.	
1993-09-15 12:25	9		10.	6.	

Water Quality Remark Code	Description
<	Actual value is known to be less than the value shown.
nd	UNKNOWN

Questions about data gs-w-ca_NWISWeb_Data_Inquiries@usgs.gov
Feedback on this websitegs-w-ca_NWISWeb_Maintainer@usgs.gov
USGS 10356500 SUSAN R A SUSANVILLE CA Water Quality Data
http://water.usgs.gov/ca/nwis/qwdata
Retrieved on 2001-08-24 12:47:43 EDT
Department of the Interior, U.S. Geological Survey
USGS Water Resources of California
Privacy Statement || Disclaimer || Accessibility
5.72 0.99

1989-11-15 10:50	9	20.	≤ 1.	≤ 3.	≤ 1.	≤ 1.	120.
1990-01-24 11:30	9	20.	≤ 1.	≤ 3.	1.	≤ 1.	120.
1990-05-16 12:15	9	18.	1.	≤ 3.	1.	1.	100.
1990-09-19 11:30	9	28.	≤ 1.	≤ 3.	1.	≤ 1.	140.
1990-11-15 10:40	9	20.	≤ 1.	≤ 3.	1.	≤ 1.	120.

SAMPLE DATETIME	MEDIUM CODE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
1991-01-16 11:20	9	19.	≤ 1.	≤ 3.	1.	≤ 1.	120.
1991-05-14 08:30	9	12.	≤ 1.	≤ 3.	2.	≤ 1.	58.
1991-09-18 11:40	9	30.	1.	≤ 3.	1.	≤ 1.	150.
1991-11-20 11:10	9	20.		≤ 3.			120.
1992-01-29 10:45	9	15.		≤ 3.			110.
1992-05-27 12:15	9	26.		≤ 3.			130.
1992-09-16 13:20	9	29.		≤ 3.			150.
1992-11-18 13:00	9	22.		≤ 3.			130.
1993-01-26 11:20	9	23.		≤ 3.			110.
1993-05-12 12:15	9	10.		≤ 3.			50.
1993-09-15 12:25	9	27.		≤ 3.			130.

Water Quality Remark Code	Description
<	Actual value is known to be less than the value shown.
nd	UNKNOWN

Questions about data gs-w-ca_NWISWeb_Data_Inquiries@usgs.gov
Feedback on this websitegs-w-ca_NWISWeb_Maintainer@usgs.gov
USGS 10356500 SUSAN R A SUSANVILLE CA Water Quality Data
http://water.usgs.gov/ca/nwis/qwdata
Retrieved on 2001-08-24 12:38:02 EDT
Department of the Interior, U.S. Geological Survey
USGS Water Resources of California
Privacy Statement || Disclaimer || Accessibility
2.94 1.07

STATE OF CALIFORNIA -- THE RESOURCES AGENCY GRAY DAVIS, Governor

DEPARTMENT OF WATER RESOURCES
NORTHERN DISTRICT
2440 MAIN STREET
RED BLUFF, CA 96080-2398

May 24, 2001

Mr. Tom Suk
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, California 96150

Dear Mr. Suk:

The Department of Water Resources, in cooperation with the U.S. Forest Service, has monitored water quality in Eagle Lake since the early 1970's. We recently began using low level detection techniques for metals to determine compliance with current environmental criteria. Some recent laboratory results have indicated relatively high levels of mercury in samples from several of the monitoring stations. We therefore decided to analyze fish tissue for mercury accumulation. I am providing the results of these studies for your information.

Water samples were collected from several monitoring stations according to the existing lake monitoring schedule during the year 2000 using procedures of Environmental Protection Agency Method 1669. Surface samples were collected by dipping a clean teflon or glass bottle to a depth of about a half meter, while bottom samples were collected with an acid washed teflon bomb sampler and decanted into a teflon or glass bottle. Ten Eagle Lake trout of various lengths were collected from the Department of Fish and Game egg taking station at Pine Creek on March 28, 2001, wrapped in aluminum foil, and frozen. All analyses were performed at Frontier Geosciences in Seattle, Washington.

All lake monitoring sites sampled on June 13 contained elevated concentrations of total recoverable mercury that exceeded the criteria of the California Toxics Rule (Figure 1). Subsequent monitoring did not detect any elevated concentrations until November 7, when a bottom sample from Station 14 was reported to contain a relatively high level of total recoverable mercury that exceeded the National Toxics Rule, but not the CTR. We will continue to analyze mercury from water samples collected this year.

Tissues analyzed from Eagle Lake trout were found to have up to 0.0751 milligrams per kilogram wet weight of total recoverable mercury. The California Office of Environmental Health Hazard Assessment considers 0.3 mg/kg as the action level for protection of human health, which indicates that Eagle Lake trout are safe for

human consumption. Mercury concentrations in fish showed a weak correlation between both fork length (Figure 2) and weight (Figure 3).

Recently, two osprey from Eagle Lake died within a few months following release on Catalina Island. Both birds had elevated mercury levels. The source for mercury contamination in the birds has not been identified. A study conducted in 1994 on prey selection by Eagle Lake osprey found that tui chubs were the dominant component of osprey diets, while the contribution from Eagle Lake trout was minuscule. Therefore, we plan to collect tui chubs this summer for mercury analyses to determine whether these fish have elevated mercury levels that may be affecting their predators.

If you have any questions or need additional information, please contact me at (530) 529-7326.

Sincerely,

Jerry Boles

Jerry Boles, Chief
Water Quality and Biology Section

Attachments

Figure 2. Total Recoverable Mercury in Eagle Lake Trout

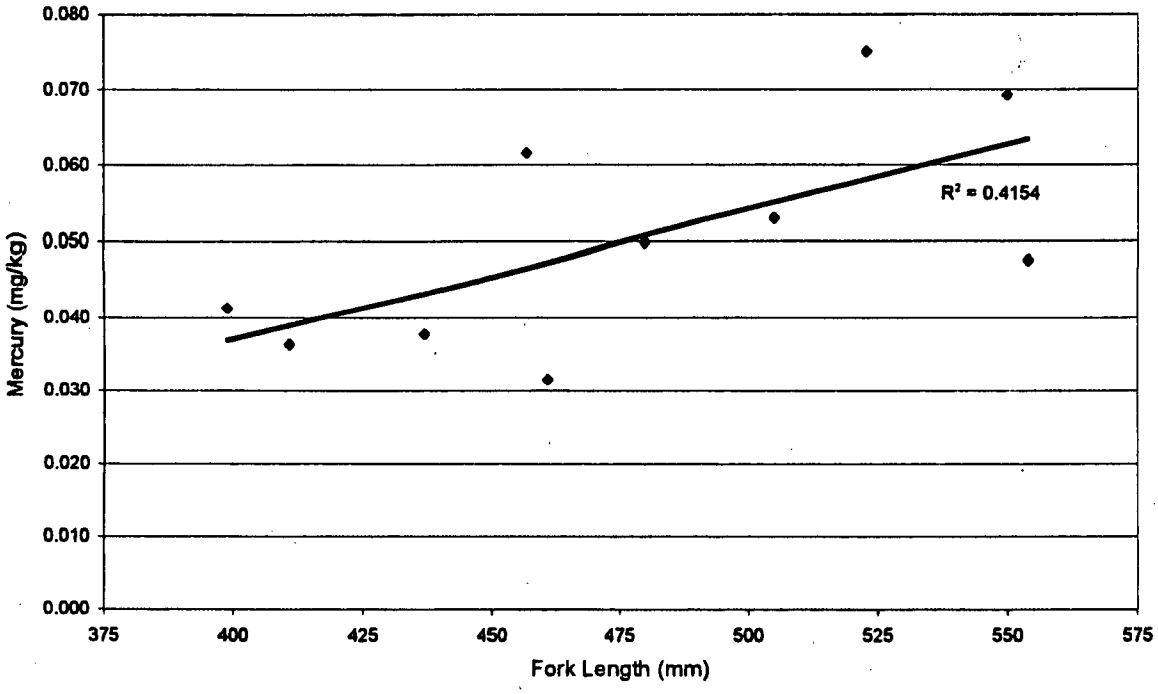


Figure 3. Total Recoverable Mercury in Eagle Lake Trout

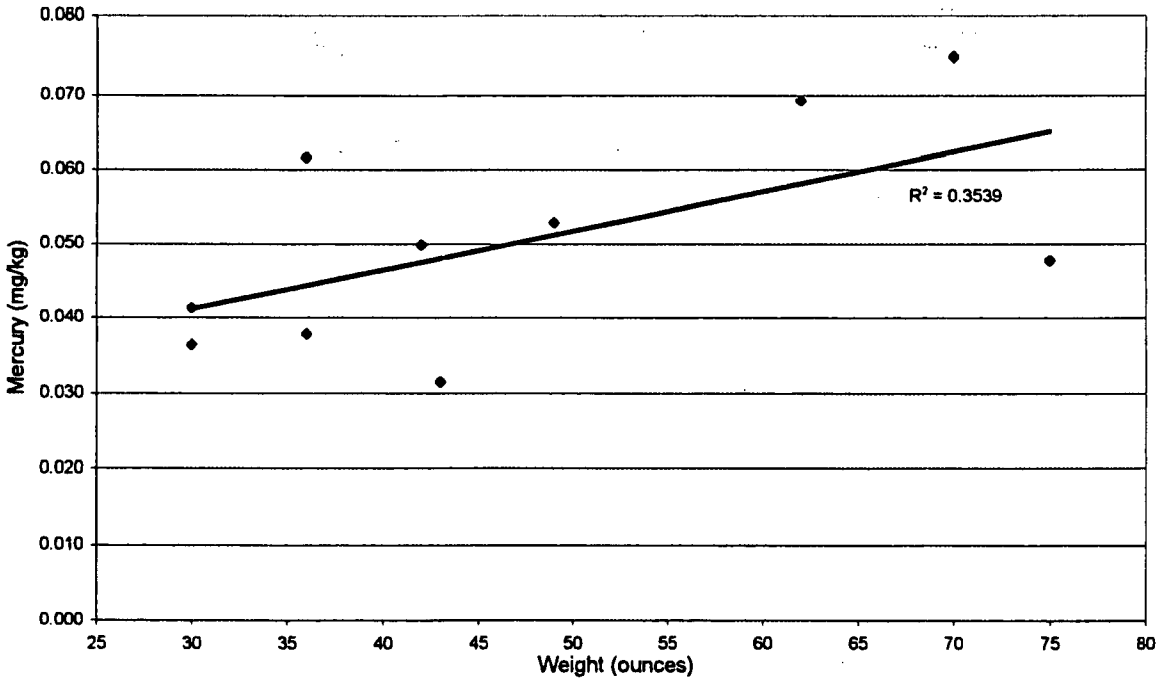
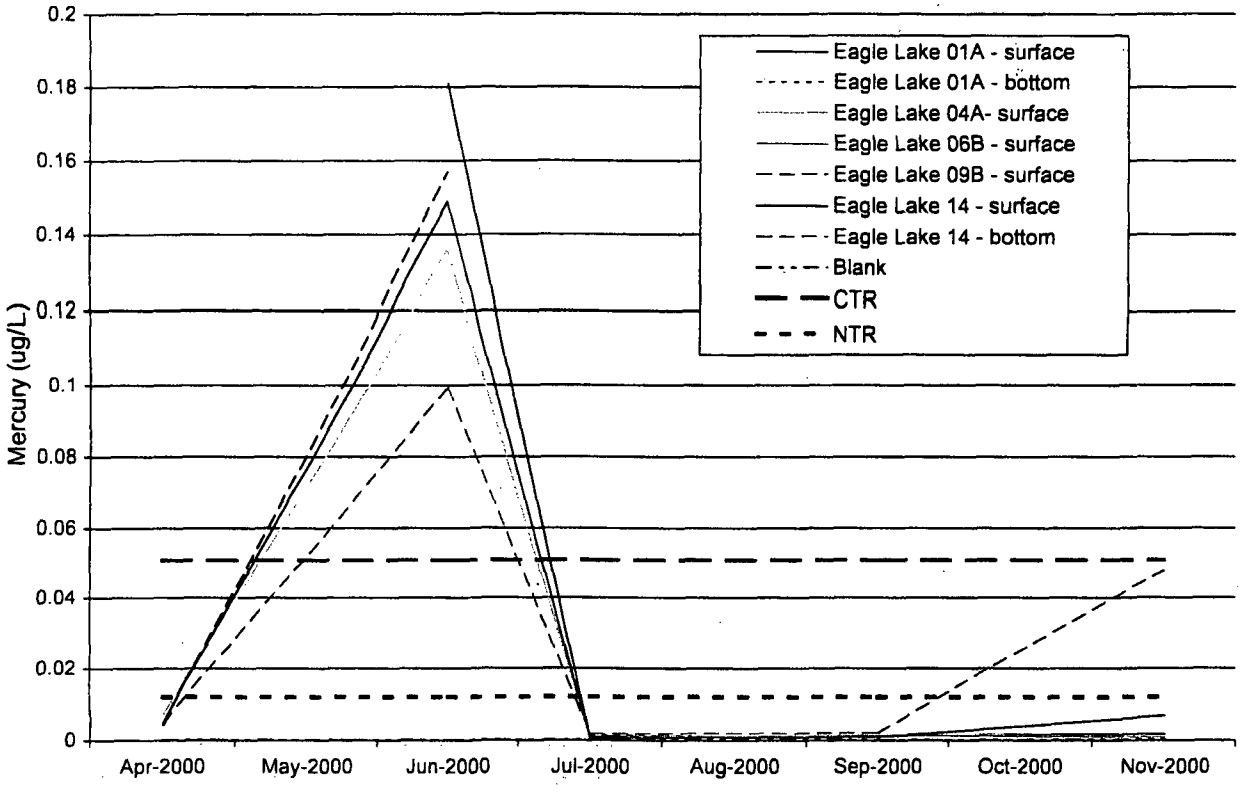


Figure 1. Total recoverable mercury from Eagle Lake



DECISION NOTICE
and
FINDING OF NO SIGNIFICANT IMPACT
for
PINE CREEK RIPARIAN & FISH PASSAGE IMPROVEMENT PROJECT

Eagle Lake Ranger District, Lassen National Forest
USDA - Forest Service

I. Introduction

An Environmental Assessment (EA) has been prepared to describe alternative management strategies and proposed projects to improve the riparian and fish passage of Pine Creek and disclose the potential environmental effects of their implementation. The assessment area encompassed 31.35 miles of Pine Creek and its riparian zone. The Pine Creek Riparian & Fish Passage Improvement Project EA is available for review at the Forest Supervisor's Office of the Lassen National Forest in Susanville, California.

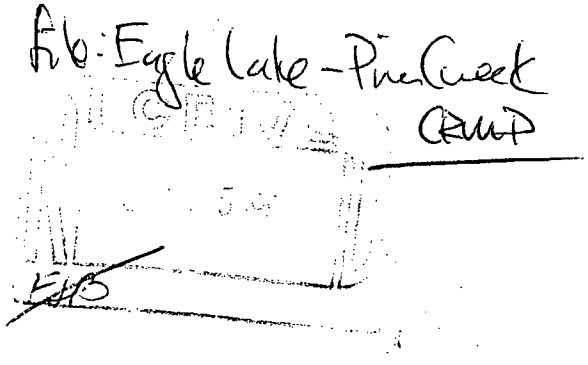
II. Proposed Action

The proposed action is to improve the riparian habitat and fish passage capability of Pine Creek by changing livestock grazing management along the creek and completing several projects within the next five years which are identified more specifically in Alternative IV-LRMP within the Pine Creek Riparian & Fish Passage Improvement Project E.A.

III. Purpose and Need for Action and Project Objectives

The National Forest Management Act (NFMA) requires that wildlife habitat be managed to maintain viable populations of existing native and desired non-native vertebrate species. Although a very successful hatchery operation is in place and 200,000 Eagle lake trout are stocked annually in Eagle Lake, natural propagation of this subspecies is not occurring. The situation is critical since suitable spawning habitat is available in the upper reaches but, because of deteriorated conditions and obstructions along the migration route, Eagle Lake trout are not able to reach the available habitat for natural reproduction.

The proposed action is designed to achieve desired conditions of Pine Creek stream/riparian habitat and eliminate obstacles which prevent fish migration to the perennial spawning grounds of Pine Creek from Eagle Lake.



IV. Decision and Rationale for Selection

It is my decision to select Alternative IV-LRMP, identified in the Pine Creek Riparian & Fish Passage Improvement Project E.A. with some modifications to meet the objectives identified for this area.

There are several alternate ways in which land management activities can occur and still meet the Forest Plan standards and guidelines and the riparian/fish prescription. This alternative includes multiple resource activities that are compatible with moving toward the desired condition.

Implementation of Alternative III-No Action would cause the condition of the creek to continue to degrade. Alternative V-Corridor would improve the riparian/stream habitat fastest and has a high Environmental Quality Benefit Rating " (EQBR) but eliminates resource activities that are compatible with the objectives.

Alternatives I-Platts, II-CRMP, and IV-LRMP are very similar. Individual portions of the various alternatives may rank higher for one area than another, but only Alternative IV-LRMP ranks within the top two alternatives for both the proposed grazing strategies and proposed projects. Alternatives I-Platts and IV-LRMP have the highest "Environmental Quality Benefit Rating " (EQBR) for the proposed grazing strategies and Alternatives IV-LRMP and II-CRMP have the highest EQBR for the proposed projects.

V. Brief Description of the Selected Alternative

Alternative IV-LRMP proposes to manage grazing on Pine Creek and its riparian areas in the following manner.

1. Continuation of a three pasture rest rotation grazing system including .9 miles of Pine Creek.
2. Excluding grazing along 7.55 miles of Pine Creek by management and with channel and riparian exclosures.
3. Permit fall gathering only within identified pastures which include 1.45 miles of Pine Creek
4. Permit occasional grazing when needed to meet vegetation objectives within units including 2.6 miles of Pine Creek.
5. Permit short duration grazing within units including 3.95 miles of Pine Creek.
6. Allow short duration late grazing within units including 3 miles of Pine Creek 2 out of three years.
7. Rest identified units 3 years then graze 1 of three years which include 2.25 miles of Pine Creek. (Note the identified units will be in the third year of rest the season of 1995).
8. Permit grazing under the "riparian pasture" strategy within units including 8.15 miles of fence.

* For specific locations of different strategies see page 13 of the E.A.

Projects included within this alternative will be 15, 17-19, 26-35, 37 and 38.
For specific locations of these projects see Appendix B "Project Descriptions " within the E.A.

After careful consideration of the comments received during the E.A. review period, I have decided to make the following changes to Alternative IV-LRMP.

1. Drop project 22 (19 miles of fence creating three pastures and fencing livestock off highway 44) until the project becomes a priority for Caltrans.

2. The Riparian pasture & late graze prescription will be changed as follows: Riparian pasture prescription - Allowable use will be 40 percent by dry weight of the identified key species leaving 4-6 inches of stubble height. Utilization on woody riparian vegetation is set at no more than 30 percent of the current years growth.

3. Reach 9 will have the following changes - The waterhole located in section 32, T32N R9E will be fenced and used as a water-gap by both the north and south pasture. The remaining portion of Pine Creek in Reach 9 will be fenced as an exclosure and not grazed. This will allow the South Pasture of Lower Pine Creek to be grazed as short duration as is the rest of the allotments which will fit into the management of the area.

4. Reach 10 is within the North Pasture of Lower Pine Creek allotment. The grazing strategy for this reach is short duration late grazing. It will be changed to short duration with late grazing two out of every three years. Late grazing will be considered anytime after August 10. This will be beneficial to the Greater sandhill crane and will still be practical as a grazing management scheme to fit in with the other pastures to be grazed.

5. The grazing strategy of Reach 0 will be changed to "No Grazing by Management" and Project 37 (fence to exclose reach 0) will be dropped unless it is apparent after two years that the permittee is incapable of accomplishing the No Grazing by Management strategy.

6. The access to the drafting site at Leaky Louie's Pond will be used for emergencies only and will be signed accordingly.

VI. Alternatives and Scope of the Analysis

The alternatives were developed by the Interdisciplinary (ID) Team using the process directed by the National Environmental Policy Act (NEPA). This This process provided a range of choices for managing resources within the project area. There were five alternatives considered in detail for this analysis. They are: Alternative I-Platts; Alternative II-CRMP; Alternative III-No Action; Alternative IV-LRMP; and Alternative V-Corridor.

Alternative I - Platts - The Platts alternative was designed to implement recommendations made in a report by an outside consultant who was contracted to assess and provide recommendations on how to restore the stream/riparian habitat of Pine Creek.

Alternative II - CRMP - This alternative was developed by a Coordinated Resource Management Planning team. The team formed seven Technical Review teams; Splitter, Champs, Harvey, Silver Lake, Lower Pine Creek, Upper Pine Creek, and North Eagle Lake. Each team developed a CRMP

preferred alternative for managing the Pine Creek stream/riparian habitat within their assigned area. The alternative is very similar to what this team recommended.

Alternative III - No Action - This alternative proposes continuation of the existing grazing management techniques within Pine Creek riparian area. Modifications to the existing management of the allotments would have to be made to accomplish Forest Plan Standards and Guidelines and the riparian/fish prescription.

Alternative IV - LRMP - This alternative was developed after sending the first EA to the public for comments. The comments were divided favoring Alternative I - Platts or Alternative II - CRMP. Alternative IV - LRMP was developed with this in mind and recognizing that multiple resource activities are compatible with the purpose of the LRMP Riparian/Fish prescription.

Alternative V - Corridor - This alternative was designed to restore Pine Creek stream/riparian area by implementing certain projects and excluding livestock use of the riparian areas of Pine Creek.

VII. Alternatives Not Considered in Detail

Several combinations of the existing alternatives were dismissed from detailed consideration because they did not differ significantly enough to establish different alternatives.

An alternative to eliminate grazing from Pine Creek watershed was dismissed from detailed consideration because it would require changes far outside the project area, and the Lassen Forest Plan presently allows continued grazing.

VIII. Issues and Their Resolution

1. To what extent will the alternatives restore Pine Creek to allow for fish passage during Eagle Lake trout spawning migrations?

> Alternative V-Corridor - would optimize the rate of recovery although Alternative I-Platts, Alternative II-CRMP, and Alternative IV-LRMP would all move toward restoration of Pine Creek and allow for fish passage. Only minor improvements would occur with Alternative III-No Action.

2. How will the alternatives affect the nutrient and sediment loads to Eagle Lake through improved streambank stability, moving toward desired channel conditions?

> This issue was measured using three indicators; length of time for the stream channel to achieve stable channel conditions, changes in width:depth ratio of the stream and changes in sinuosity, all of which if improved would decrease nutrient loads and sediment transport to Eagle Lake.
>
> Nutrient loads and sediment transport would decrease sooner with Alternative V-Cooridor would decrease with Alternative I-Platts, Alternative II-CRMP, and Alternative IV-Corridor and would continue at near current levels with Alternative III-No Action.

Width to Depth ratios and sinuosity would improve best with Alternative V-Corridor and least to no change with Alternative III-No Action. Narrowing of the channel and increased sinuosity would occur with Alternative I-Platts, Alternative II-CRMP and Alternative IV-LRMP but slower with Alternative II-CRMP because more grazing of riparian vegetation would occur.

3. How will the alternatives affect the riparian vegetation?

This issue was measured using the percentage of vegetative and litter cover on soils along the riparian area of Pine Creek, the health and extent of riparian hardwood stands, presence of overhanging grasses, sedges and hardwoods along streambanks at the main channel, and the compatibility with habitat occupied by sensitive plants as indicators.

Riparian vegetation and ground cover would increase in sedge and grass-forb riparian types with Alternative I-Platts, Alternative II-CRMP, Alternative IV-LRMP and Alternative V-Corridor. The change would occur over a shorter period of time with Alternative V-Corridor and a longer period of time with Alternative II-CRMP. There may be some positive effects in the future with Alternative III-No Action but at a very slow rate.

Existing riparian hardwoods would grow and spread out with Alternative I-Platts, Alternative II-CRMP, Alternative IV-LRMP, and Alternative V-Corridor although the areas would be more extensive with Alternative V-Corridor. There would be very little increase in riparian hardwoods with Alternative III-No Action.

Overhanging streambanks would develop more rapidly and extensively with Alternative V-Corridor although Alternative I-Platts and Alternative IV-LRMP would develop more rapidly and extensively than Alternative II-CRMP which would develop more rapidly than Alternative III-No Action.

The *Mimulus pygmaeus* populations within this project area have all been subjected to grazing for many years and no apparent detrimental effect to the plant has been observed.

4. How will the alternatives affect other wildlife habitat?

Bald Eagles and peregrine falcons (both listed as Endangered under the Endangered Species Act) are seen hunting in the project area. Greater sandhill crane, American marten and Sierra Nevada red fox (all Forest Service Region 5 Sensitive species) have been sighted within the project area and Northern goshawk, California Spotted owl, willow flycatcher, Pacific fisher and wolverine (all Forest Service Region 5 Sensitive species) have not been sighted within the project area, but the area offers suitable habitat for the species.

There will be no effect on the endangered species found within the project area.

Currently, there is one bald eagle nesting territory within the project area, therefore only one pair would be subject to any new or additional disturbances. There is only one proposed project in the vicinity of this nesting territory, a riparian exclosure fence, so any disturbance would be mitigated by deferring construction until after the bald eagle nesting period.

Peregrine falcons are transient through the project area, as no suitable nesting habitat of rugged rock cliffs is available in the vicinity.

Alternative V-Corridor creates the greatest amount of riparian exclosure from livestock grazing, thereby causing the most rapid recovery rate for the riparian zone which would provide the most benefits to the species in the short term; longterm benefits are expected to be similar under all alternative.

5. How will the alternatives affect grazing management within the Pine Creek watershed?

The effect on grazing management is measured as the change in number of Animal Unit Months (AUM's) and the number of person days required by the permittees to accomplish the changes in management of the allotments.

Alternative II-CRMP would cause no decrease in numbers of AUM's, AUM's would have to be adjusted within allotments that have proposed pastures for three years of rest within Alternative I-Platts and Alternative IV-LRMP. Alternative III-No action would cause the largest decrease in numbers of AUM's and Alternative V-Corridor would have the second largest decrease.

The person days required by the permittee to accomplish the changes in management of the allotments will increase with all alternatives. Alternative V-Corridor will require more fence maintenance since 53 miles of new fence is proposed, Alternative III-No Action will require more riding to keep cattle from the riparian areas. Alternative I-Platts, Alternative II-CRMP and Alternative IV-LRMP will require more riding and fence maintenance but not as many number of person days as that required by Alternative V-Corridor and Alternative III-No Action.

IX. Public Involvement

In fall of 1987, affected agencies and individuals were invited to participate in a field trip to discuss the existing state of Pine Creek. As a result of the follow-up meetings, the interested parties agreed to work together in a Coordinated Resource Management Planning (CRMP) effort. The initial CRMP members included representatives of the following agencies and affiliations: U.S. Forest Service as the lead agency (USFS), California Department of Fish and Game (DCDFG), Soil Conservation Service (SCS), Lahonton Regional Water Quality Control Board, Bureau of Land Management (BLM), Eagle Lake Resource Area, University of California Extension Service, Ducks Unlimited, Eagle Lake Audubon Society, Honey Lake Valley Regional Conservation District, California trout, major private land owners within the watershed, grazing permittees and interested individuals.

Public input was gathered through several meetings concerning different aspects of Pine Creek riparian and the ability for fish passage. The comments were analyzed and to the extent possible, issues, concerns, and opportunities were addressed in the EA.

An EA was prepared and 100 copies were sent to affected/interested key publics, in July for a 30 day comment period which ended on August 22, 1994. The comments were analyzed and to the

extent possible, and two additional alternatives were included to form a new EA. The new EA was sent to over 100 individuals for comment in February for a another 30 day comment period which ended on March 31, 1995.

FINDING ON NO SIGNIFICANT IMPACTS

I have determined that my decision to select Alternative IV-LRMP, analyzed in the Pine Creek Riparian and Fish Passage Improvement Project Environmental Assessment, is not a major federal action which would significantly affect the quality of the human environment either beneficially or adversely; therefore an Environmental Impact Statement (EIS) is not needed for this analysis. This determination is based on the following factors:

Implementation of Alternative IV-LRMP will not produce any significant irretrievable, irreversible or cumulative effects:

1.) Alternative IV-LRMP is not related to other actions with individually insignificant but cumulatively significant impacts.

2.) Public health and safety will not be significantly affected by any of the activities that could occur under Alternative IV-LRMP.

3.) No adverse effects are expected on historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers,or ecologically critical areas under Alternative IV-LRMP.

4.) The effects on the quality of the human environment with actions allowed under Alternative IV-Platts not likely to be highly controversial.

5.) Actions included within Alternative IV-LRMP are not likely to be highly controversial. Controversy in this context refers to cases where a substantial dispute exits as to the size, nature or effect of the major federal action rather than to the existence of opposition to a use.

6.) Actions included within Alternative IV-LRMP do not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.

7.) Actions involved within Alternative IV-LRMP are not related to other actions with individually insignificant but cumulatively significant impacts.

8.) There will by no adverse affect to districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places and will not cause loss or destruction of significant scientific, cultural, or historical resources.

9.) A Biological Evaluation (BE) has been written for threatened, endangered, and sensitive species potentially affected by activities. The BE concluded that selection of Alternative IV-LRMP will

have no effect on threatened or endangered species and will not result in a trend toward federal listing for sensitive species.

10.)The selected actions do not threaten to violate Federal, State, local law, or requirements imposed for the protection of the environment.

ADMINISTRATIVE REVIEW OPPORTUNITIES

This decision is subject to appeal pursuant to 36 CFR 217. Any written notice of appeal of this decision must be fully consistent with 36 CFR 217.9, "Content of a Notice of Appeal," including the reasons for appeal must be filed with the Reviewing Officer: Lynn G. Sprague, Regional Forester, Region 5, USDA Forest Service, 630 Sansome Street, San Francisco, CA 94111, Attn. Appeals. The notice of appeal must be post marked by August 4, 1995, (within 45 days of the date that this decision appeared in the *Lassen County Times*). Appelants must submit two copies of the Notice of Appeal.

For further information contact: Joyce Coakley, Rangeland Management Specialist, (916) 336-5521, Hat Creek Ranger District, Lassen National Forest, Fall River Mills, CA, 96028.

ROBERT W. ANDREWS
District Ranger

6-9-95
DATE

APPENDIX K
PINE CREEK NUTRIENT LOADING TO EAGLE LAKE

Pine Creek Nutrient Loading to Eagle Lake

The Lassen National Forest conducted a water quality study on Pine Creek and Papoose Creek in 1987, to determine the initial magnitude and variability of some water parameters and the potential effects of those streams on the nutrient balance in Eagle Lake. Sampling was discontinued in subsequent years because of recurring drought condition and an absence of notable seasonal streamflows in Papoose Creek. Samples were taken at four locations, shown on Figure 1 (attached). The California Department of Fish and Game sampled the same stations on Pine Creek in 1993.

In 1987, after a winter with 79% of normal precipitation following a wet winter with normal groundwater recharge, Pine Creek flowed for 50 days. In 1993, after a winter with good snow accumulation and approximately 150% of normal precipitation, Pine Creek flowed for 98 days. Based on the stream gauge maintained by the California State Department of Water Resources near the mouth of Pine Creek, a hydrograph was plotted for each year. The sampling dates were marked on the hydrographs, and the measured nitrate and phosphorous in each sample were applied to a proportionate part of the inflow into Eagle Lake. The inflows and nutrient loads are summarized in Table 1.

Table 1—Estimated Pine Creek nutrient contributions to Eagle Lake[1]

	1987	1993
Total Pine Creek inflow to Eagle Lake	1,905 acre-ft.	35,520 acre-ft.
Estimated total nitrogen [2] loading to Eagle Lake	1.6 tons	6.9 tons
Estimated total phosphorous loading to Eagle Lake	1.8 tons	2.1 tons
Estimated total ortho-phosphate loading to Eagle Lake	0.1 tons	0.3 tons

[1] Based on the laboratory analysis of samples taken by the Lassen National Forest in water year 1987 and by the California Department of Fish and Game in 1993.

[2] 1987 total nitrogen is based on total dissolved NO2 and NO3. 1993 total nitrogen is based on NO2 + NO3 + Kjeljahl (organic) nitrogen concentrations.

Some additional inferences may be made from the data and years of informal observations by Forest Service employees, namely:

1. Pine Creek's flows are heavily influenced by current year snowpacks in the headwaters and on the valley floors. Valley snows melts first, saturating the

stream and its near channel zone. On the recession side of the hydrograph (i.e. when flows are decreasing), flows are sustained by melting of snow from higher elevation, by contributions from the eight mile perennial reach of the creek above Highway 44, and by drainage of groundwater stored in the near channel banks during earlier, higher flows.

2. Some of the highest total (dissolved) nitrogen and phosphorous concentrations were observed early in the runoff season at the station above Highway 44, where cattle grazing had a mostly minor impact on the channel and where the riparian vegetation is least affected by livestock. The highest concentrations measured during the two years' sampling were 1.80 mg/L total nitrogen and 0.59 mg/L total phosphorous (both at PC4 on 3/10/87), but most results were less than 0.10 mg/L for both nutrients—particularly later in the runoff season. Total organic nitrogen (Kjeljahl) was generally below limits of detectability, except for some late season readings on the three downstream stations (PC-1, PC-2, and PC-3) that were probably due to floating algae fragments in the samples. At PC-1, Total Kjeljahl nitrogen was 0.50 mg/L on 5/21/93 and 0.98 mg/L on 7/2/93. At PC-2, Total Kjeljahl nitrogen was 0.52 mg/L on 6/11/93 and 0.63 mg/L on 7/2/93. At PC-3, Total Kjeljahl nitrogen was 0.50 mg/L on 5/28/93 and 0.71 mg/L on 7/2/93. Total nitrogen should consist of the sum of total dissolved and Kjeljahl (organic nitrogen)[1]; the high PC-1 Kjeljahl readings were included in the total nitrogen loading to Eagle Lake shown in Table 1. These readings were obtained late in the flow season, during longer, warmer days when algae and instream organic matter was high with diminishing flows. The late-season organic nitrogen (Kjeljahl) loading represents an increment of 1.2 tons to Eagle Lake. Their effect was included in the total Nitrogen loading calculations for 1993, even though those high readings might not be truly indicative of longer term water quality conditions in Pine Creek. (For example, they could be more an indicator of wet year, late season water quality conditions.)

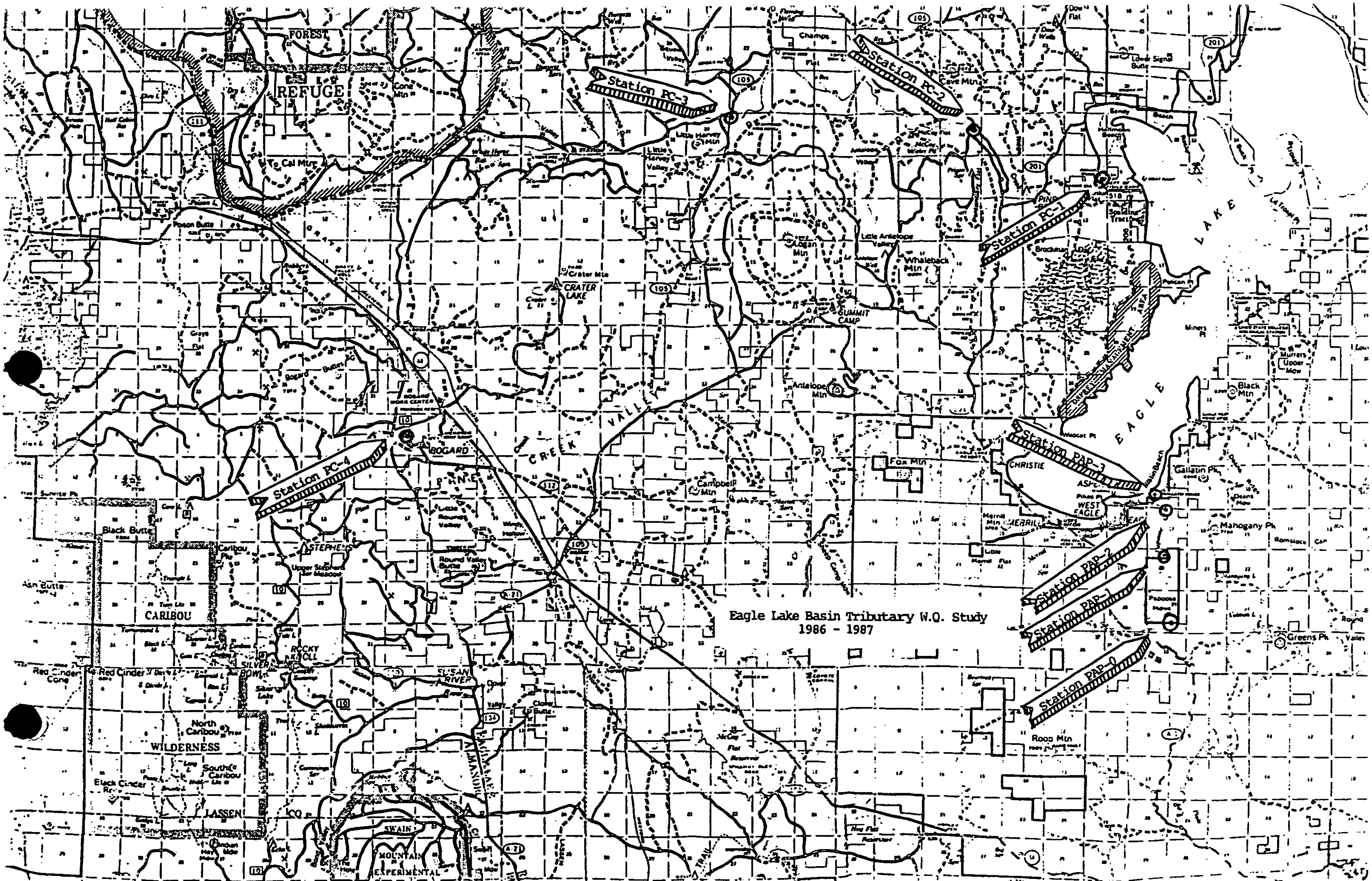
3. Pine Creek's chemistry exhibits a spring flushing of dissolved nutrients at all stations, but that effect is most notable at the upstream station (PC-4). As mentioned above, there seems to be a build up of organic nitrogen toward the end of the flow period, especially in wet years when the flow period extends into July.

4. Phosphorous is thought to be the limiting nutrient in Eagle Lake[2], and phosphorous increases presumably threaten the eutrophic state of the lake and its trout fishery. Total phosphorous loadings by Pine Creek to Eagle Lake were remarkably similar in 1987 and 1993, under notably different runoff years, drought and wet. While the data may be too scanty to support a long term conclusion, analysis of the sampling information and measured flows in 1987 and 1993 resulted in near-constant phosphorous loading to Eagle Lake. Such a response seems to link Pine Creek's phosphorous loads with in channel or near channel sources that are

1. Per telephone conversation with Laurie Zander, Lahontan Regional Water Quality Control Board staff, 9/12/94.
2. Raymond Vail and Assoc., 1979. Eagle lake limnological analysis. Vol. 5, Eagle Lake Basin Planning Study. Sacramento, CA: Raymond Vail and Assoc. 45p. (That paper cites articles by Paul E. Maslin, California State University, Chico, including Maslin, Paul E. and Boles, Gerald L., 1978. Use of a multiple addition bioassay to determine limiting nutrients in Eagle Lake, California. Hydrobiologia, 58(3), pp261-269.)

leached away to Eagle Lake at relatively slow rates. The amount of nutrients entering the lake on clay and silt sized sediment particles was not measured, and any subsequent, additional nutrient loading to the lake from dissolution off of deposited sediments has not been evaluated.

5. Dissolved phosphorous loadings to Eagle Lake could be reduced by improving aquatic and riparian vegetation along Pine Creek, to increase capture of dissolved nutrients. The management measures most likely to have favorable effects on reducing nutrient loads carried by Pine Creek would be measures to improve in-channel and near channel vegetation and to reduce bank erosion and caving and sheet erosion from nearby rangeland in McCoy Flat and Champs Flat valleys—and (to a much lesser extent) in Pine Creek Valley.


Eagle Lake Basin Tributary W.Q. Study
1986 - 1987
Station PC-1
Station PC-2
Station PC-3
Station PC-4
Station PAP-0
Station PAP-1
Station PAP-2
Station PAP-3
EAGLE LAKE
REFUGE
FOREST
CARIBOU
WILDERNESS
LASSEN
BOGARD
PINE CREEK VALLEY
CRATER LAKE
SUMMIT CAMP
CHRISTIE
WEST EAGLE
SUSAN RIVER
SWAIN MOUNTAIN
EXPERIMENTAL
Logan Mtn
Antelope Mtn
Campbell Mtn
Fox Mtn
Whaleback Mtn
Black Mtn
Mahogany Pk
Gallatin Pk
Roop Mtn
Black Butte
Red Cinder
Red Cinder Cone
Ash Butte
Black Cinder
Rocky Knoll
Stephens
Cone Mtn
Poison Butte
Champs
Cave Mtn
Miners Pt
Pelican Pt
Greens Pk

APPENDIX L
COMMENTS AND RESPONSES

FOREST PLAN

- **Comment:** We are still confused with on-the-ground interpretations of these standards and guidelines. We believe that "standards" should be clearly noted mandatory as opposed to "guidelines" which provide preferred direction.

  Response: The Lassen National Forest's Land and Resource Management Plan incorporates Forest wide standards and guidelines; a riparian/fish prescription applicable to all management activities along Pine Creek and its tributaries' riparian zones (generally 200-250 feet on each side of the main channel, but including wetland valley bottom areas); and some more specific standards and guidelines for individual management areas in the Pine Creek watershed. We do not believe that drawing a distinction between standards and guidelines is particularly useful. Both categories are policy directions that differ only in degree, and both are mandatory. Ideally standards are be more quantitative, and guidelines are more subjective, leaving more room for flexible responses to differing, site-specific situations. EPA and State board approved Best Management Practices (BMP's) for water quality protection are required for all land management actions on the Forest. The EA (p.2, col. 2, para 3) notes that "The potential natural conditions described by Platts for each (valley bottom type) will serve as the desired condition for the (mapped) reaches (of Pine Creek)." These desired conditions are the riparian objectives for Pine Creek, within the constraints detailed in Forest Plan prescriptions, standards, and guidelines and the requirement to apply BMP's in all activities.

- **Comment:** The Lassen LRMP mandates: The Pine Creek Riparian Zone be managed under the Riparian/Fish prescription which would mean that utilization of forage by livestock would be secondary.

  Response: The Riparian/Fish Prescription of the Lassen LRMP states that the management of livestock should enhance or protect riparian areas as needed. This includes salting placement, modify grazing systems, elimination of livestock, as needed, in order to protect or correct damage to vegetation or streambanks. The Pine Creek EA has followed this criteria, including developing new riparian pastures, fence exclosures, and changes in grazing systems of riparian areas.

- **Comment:** This EA is the second publicly circulated draft. The Department made extensive comments on the first draft on August 26, 1994. We appreciate the US Forest Service (USFS) modifying the EA to reflect some of our comments, however, there are still several significant areas of concern which the Lassen national Forest has neglected to address in the EA.

  Response: This EA is not a draft, it is a final EA which has been send out for a 30 day comment period. A Decision Notice will be published along with an appendix to the EA where comments are discussed. The second EA was sent out for review since two extra alternatives were developed after the first comment period. Many changes were made to the EA based upon the comments received, although all comments did not reflect a modification in the EA because they suggested changes that were outside NEPA regulations.

- **Comment:** As stated in our previous comment letter the Department believes that this document will not be acceptable to the State Water Resources Control Board as a final report pursuant to the requirements of the Environmental Protection Agency Clean Lakes Grant.

  Response: Forest Service believes that this document has met the requirements of the Environmental Protection Agency Clean Lakes Grant.

- **Comment:** Page 5, Key indicators: 2.B "Changes in width:depth ratio of the stream (less than 10 for B channel types and less than 5 for C channel types)." A definition of B and C channel types would assist the reviewer unfamiliar with these terms. It is also unclear is the change is to be less than 10 or the final ratio is less than 10.

  Response: The final objective for the width:depth ratio of Pine Creek is less than 10 for the B channel types and 5 for the C channel types. The most recent reference for channel types is: Rosgen, David L., 1994. A classification of natural rivers. Elsievier Science. Catena 22 (1994): 169-199.

- **Comment:** A purpose and need does not exist for this environmental assessment if all of the limiting environmental issues concerning the propagation of the Eagle Lake trout are not considered. Two man made limiting factors are: 1) the populations of brook trout in perennial reaches of Pine Creek; 2) the non monitored drafting of water from Leaky Louie's Pond in Pine Creek.

  Response: The purpose and need is derived from the National Forest Management Act (NFMA) which requires that wildlife habitat be managed to maintain viable populations of existing native and desired non-native vertebrate species. The issue of the populations of brook trout is beyond the scope of this EA. This issue will be discussed

in a separate EA. The issue of the non monitored drafting at Leaky Louie's pond will be addressed in the Decision Memo, which will allow drafting only for emergency use. This will be signed accordingly. If abuse continues, then access to the drafting site will be barricaded.

- **Comment:** This project should be analyzed by an Environmental Impact Statement (EIS).

  Response: Through the scoping process, it was determined that an EIS was not necessary, and was further determined so by a finding of no significant impact (FONSI) in the environmental assessment (40 CFR, 1508.9).

- **Comment:** NEPA, NFMA, the Lassen LRMP and numerous other legal acts essentially mandate restoration of degraded watershed like Pine Creek.

  Response: Provisions of the National Environmental Policy Act of 1969 (NEPA) requires analysis of a federal action through an environmental assessment of the impact. The Pine Creek EA follows such procedures. The Pine Creek EA also incorporates the Prescriptions and Standards and Guidelines of the Lassen National Forest Land Resource Management Plan which are in pursuant to the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA), and implements regulations found in the Code of Federal Regulations (36 CFR 219, issued September 30, 1982).

- **Comment:** The most recent directives from the USFS Washington mandate full analysis of a No Grazing Alternative.

  Response: Our project area consists of Pine Creek and the riparian areas associated with the creek. Alternative 5-Corridor (no grazing within the project area) is analyzed in the EA. This directive, "Evaluation of Term Grazing Permits and the NEPA Process," which pertains to issuance of term grazing permits for allotments with permits expiring in 1995. This EA is not covering the issuance of a term grazing permit.

SCIENTIFIC CREDIBILITY OF THE REPORTS

- **Comment:** The Platts study was undertaken when Stephens Meadow was under other management, and the apocalyptic claim that the riparian conditions could only deteriorate was from more of a personal value judgment rather than a long time acquaintance with this area.

  Response: While time was a limiting factor for field observations of the Pine Creek drainage, William Platts is a well known and respected fisheries biologist with consid-

erable experience in the interactions of livestock and riparian areas. Existing data and Forest Service personnel were extensively utilized by Platts during his visit.

- **Comment:** Concerned that the Platt's alternative was developed by a person who was only on-the-ground for a minimum of two weeks.

  Response: See the response above.

- **Comment:** Platts and Jensen made some assumption in their studies that were not supported by data and could be refuted by further research. To say that an intermittent stream that does carry a tremendous volume of water when it does run, going through solid rock lava flows for up to several miles at a time, should have "stable and overhanging banks and 90-100 percent ground cover" take a pretty good stretch of the imagination.

  Response: This observation could be true. While "stable and overhanging banks, with 90-100 percent ground cover" are possible in perennial reaches, reaches that are ephemeral and located in lava chutes may never reach such condition.

- **Comment:** Platts plan is practically ignored.

  Response: Alternative I proposes implementation of most the recommendations made in the Platts and Jensen report. Parts of their recommendations are also listed within Alternative II, IV, and V.

PROJECT AREA

- **Comment:** My position is to remove the cattle from the wetlands.

  Response: Alternative V-Corridor has analyzed no grazing within the project area.

- **Comment:** Does the statement "The proposed projects will have no effects on management practices applied outside the riparian zone," imply that no change in the management of non-riparian habitats will occur, and whether roading and timber harvest does not increase peak discharge in Pine Creek, and that a Cumulative Watershed Effects analysis been completed on the Pine Creek watershed, and does the Land Management Plan require a CWE for this project, and is it prudent to risk hundreds of thousands of dollars in restoration funds if upland management continues to increase peak discharge.

  Response: A Cumulative Watershed Effects analysis was completed for the Pine Creek watershed in 1992. A copy of this analysis is available upon request. The

CWE concluded that all subbasins in the Pine Creek watershed are well below their threshold of concern for land disturbance, with harvest areas producing few notable, off-site erosion or sedimentation problems in the watershed. Additionally, the CWE is being further updated through the Ecosystem Management program for the Pine Creek watershed which will include future upland projects.

- **Comment:** The project is too narrowly focused on partial stream channel recovery.

  Response: Pine Creek was studied as a whole system, but when designing a recovery plan the proposed actions had to be site specific. Reaches that were determined to be most sensitive received special prescriptions, i.e. fence exclosures, while grazing systems were altered where needed. The reaches located within the fence exclosures may recover at a faster rate than those utilized by livestock, but by implementing the Lassen LRMP Standards and Guidelines, these reaches are expected to attain functioning stream channels.

- **Comment:** The project must include environmentally sound treatment of non-native trout species.

  Response: This comment is outside the scope of the proposed action.

ENVIRONMENTAL QUALITY BENEFIT RANKING

- **Comment:** The environmental benefits rankings are subjective and mostly speculative, therefore, should be given little merit.

  Response: Forest Service Handbook 2209.11 51, "Identification of Environmental Impacts" is available to the public, and procedures for developing environmental benefits ranking for projects are given in this handbook. The effects of range allotment projects on environmental quality are characterized by their nonmarket and nonmonetary nature. Beneficial effects are contributions resulting from the proposed projects that maintain, restore, or enhance one or more of the environmental characteristics of the area. Although the rankings are subjective, this is the best we know for speculating the effects of a proposed project on the environment.

- **Comment:** Why does alternative V have the highest ranking in terms of environmental quality benefits in appendix E and the second lowest ranking in appendix F?

  Response: The environmental quality benefit ranking was calculated for the proposed grazing strategies and the proposed projects separately. The reason for the lower rating under the proposed projects category for Alternative V is because fewer projects were proposed when compared to Alternative II and IV. Projects proposed for both alternatives received equal ratings.

- **Comment:** The alternative favored as the proposed action is not identified and the rationale for preferring it is not explained.

  Response: The National Environmental Protection Act (NEPA) requires that the preferred alternative be identified in Environmental Impact Statements not within Environmental Assessments. The proposed action is to be identified within the Environmental Assessments. The Decision Notice will identify the rationale for choosing one alternative over another one. The Decision Notice is prepared after careful consideration of the comments received after the 30 day comment period.

- **Comment:** The Preferred Alternative is inadequate to meet the project goals.

  Response: Comments of the FS specialists have determined that all the alternatives, excluding "No Action", should provide adequate response to the project goals. Some alternatives may allow a more rapid response and recovery, but long term results should be the same for the other alternatives.

- **Comment:** No grazing is the most environmentally and ecologically sound and most cost effective management activity, and the only option for realistically meeting project goals.

  Response: The Lassen LRMP goals for desired future condition and forest objectives prescribe to "provide for long-term rangeland productivity for fisheries, wildlife, soil, water, timber, and livestock forage values." By implementing the Lassen LRMP Standards and Guidelines, desired ecological conditions could be met, and still allow use of forest resources, where appropriate.

- **Comment:** The EQBR is very helpful in terms of a measuring device for riparian restoration and costs, however, the issue of the benefit to the Eagle Lake trout in terms of their natural propagation in Pine Creek is not being addressed.

  Response: This is beyond the scope of the EA. The EA covered the analysis of desired condition of the riparian habitat.

- **Comment:** It is not clear how the environmental benefit ratings were determined.

  Response: The environmental benefit ratings were based on professional judgement and reviewed by the project interdisciplinary team. The criteria used to make those judgements are identified within Forest Service Handbook 2209.11,51.

- **Comment:** The EA is unclear about how the environmental benefit ratings and rankings were made. A brief explanation of the rating process should be included for greater understanding and to (validate) the environmental consequences of the alternatives.

  Response: Procedures for deriving the environmental benefit ratings and rankings are given in Forest Service Handbook 2209.11, 51.1 "Assessing Nonmarket Values". This material is available for viewing in the Supervisors office of the Lassen National Forest.

USE OF COORDINATED RESOURCE MANAGEMENT PLAN (CRMP) TEAM ALTERNATIVE

- **Comment:** Alternative 2 - CRMP, should be kept as the preferred alternative. The parties involved dedicated a great deal of time and resources to develop the alternative.

  Response: Development of the LRMP Alternative was derived from comments of the first EA in which opinion was divided between Alternative 1-Platts and Alternative 2-CRMP. Recognizing that multiple resource activities are compatible with the purpose of the LRMP Riparian/Fish prescription, Alternative 4-LRMP was developed.

- **Comment:** A CRMP operates under guidelines, when something is agreed upon it is not just a majority vote, it is a complete consensus; everyone is in total agreement. When the F.S. put the first E.A. on Pine Creek out for public comment it received negative input on the CRMP alternative. This information was never brought back to the CRMP group so that they could revise their consensus if needed.

  Response: January 17, 1995 letter from U.S. Forest Service Washington Office: "The Federal Advisory Committee Act (FACA) restricts agencies from receiving consensus advice and recommendations–on any matter–from a committee or group which includes non-Federal members unless the group or committee is chartered under FACA or falls under a FACA exemption."

- **Comment:** If the alternative plans are to be implemented with EPA 319 grant fund, which were applied for and will be administered by the Resource Conservation District for the CRMP group, only the CRMP or LMP alternative can be used.

  Response: The purpose of this project was to evaluate the feasibility of various alternative management strategies in the Pine Creek drainage that can be combined to achieve stable streambanks and thrifty riparian vegetation to reduce discharge of sediment and nutrients into Eagle Lake.

- **Comment:** The Board of Supervisors reiterates its strong support for the accomplishments of the Pine Creek CRMP and urges that you acknowledge these efforts by selecting the CRMP alternative.

  Response: The LRMP has implemented many of the proposed actions that are within the CRMP alternative. The alternative has also been modified in response to the comments received.

EAGLE LAKE TROUT

- **Comment:** Could not find in this document if, or where, it was determined that the Eagle Lake trout would be able to propagate, even if the fish were able to reach the available habitat for natural reproduction.

  Response: This issue is outside the scope of the EA.

- **Comment:** A major shortcoming of the EA is its failure to treat the Eagle Lake trout as a formally listed species, even though the document notes that the U.S. Fish and Wildlife Service has determined that an ESA petition is warranted and will be making a decision concerning listing by August 1995.

  Response: The Eagle Lake trout is not a formally listed species. The Forest Service has worked closely with the U.S. Fish and Wildlife Service in development of the proposed project.

- **Comment:** The plan has not addressed problems of the Eagle Lake trout.

  Response: The purpose of this EA and the directives of the Forest Service is to maintain and improve where needed, the wildlife and fisheries habitat located on land managed by the Forest Service. The actual management of wildlife and fishery species, in this case the Eagle Lake trout, is the responsibility of the California Department of Fish and Game.

- **Comment:** The Eagle Lake trout is a LNF Management Indicator Species and a candidate for USF&WS listing as an Endangered Species.

  Response: The proposed action is following the recommendation of the Lassen LRMP Wildlife Management Indicator Species prescription for Waterfowl and Riparian Species by fencing selected reaches of Pine Creek and making changes in grazing systems where needed.

- **Comment:** The project is premature until the issue of USF&W listing of the trout is completed.

  Response: The Forest Service is working in conjunction with the California Fish & Game (CA F&G) and the USF&WS through the environmental assessment process for Pine Creek. Neither the CA F&G or USF&WS have suggested that this project is premature.

WATER QUALITY AND NUTRIENT LOADING

- **Comment:** There needs to be some discussion, either in Section I or Section IV about the conditions of Eagle Lake including eutrophication, algae blooms, low dissolve oxygen, fish kills, lake stratification and redissolution of phosphates from bottom sediments.

  Response: The focus for this EA is the consideration of alternatives for improving fish passage in Pine Creek and for reducing that stream's sediment and nutrient loading to Eagle Lake. Nutrient loading is discussed on pages 24-25 of the EA, and the relative contribution of Pine Creek's nutrients to the lake is mentioned (para 1, p. 24) as is the critical role played by phosphorous in the lake's chemistry (p. 24, col 2, last para). More elaborate discussions about the lake conditions are beyond the scope of this EA. The original grant application summarized ongoing monitoring and trends in Eagle Lake, but refining that analysis was not part of the grant agreement.

  Additional information about the lake's nutrient situation can be found in Maslin, Paul, 1972. A preliminary analysis of Eagle Lake water quality. Chico, CA: Dept. of Biological Sciences, California State University, Chico. Several reports from the Lahontan Regional Water Quality Control Board staff (mostly relating to point source nutrient reduction and wastewater disposal problems at Spalding Tract and other subdivisions on the lakeshore) also describe the threatened eutrophic status of the lake. A secondary source is Raymond Vail & Assoc., 1979. Eagle Lake Basin Planning Study, vol. 5, Eagle Lake Limnological Analysis. Sacramento, CA: Raymond Vail & Assoc. 45p. This volume describes nutrient cycling, trophic status and other aspects of the lake's chemistry. The Forest Service continues to participate in a long term monitoring program to assess water quality and limnological parameters in Eagle Lake, in cooperation with the California Department of Water Resources. The future of that program is uncertain, considering continued reductions in the Forest Service budget for water resources. The funding agreement was for an analysis of Pine Creek's contributions to Eagle Lake. Funds were never solicited nor received for an updated analysis of Eagle Lake conditions or to continue the Eagle Lake water quality monitoring project.

- **Comment:** Supporting data for nutrient loading summary and for generalized statements concerning Pine Creek nutrient dynamics is lacking. Request for raw data, description of collection methods, calculations, and interpretation of data. Apparent

disagreement with Department of Fish and Game about flushing effects. Need for consideration of sediment loading and for sediment monitoring.

Response: The discussion on pp 24-25 of the EA is based on two years of water sampling, 1987 and 1993. The Forest Service hydrological report was abbreviated on pages 24-25, and the table in Appendix D was not correctly footnoted. A complete copy of the report will be included as Appendix K to this EA. The data were compiled on a Microsoft Excel spreadsheet, and the method for calculating (dissolved) nutrient loadings is summarized on p 24, col 1, para 3 of the EA. Total nitrogen loading for 1993 included Kjeljahl nitrogen as part of the total nitrogen figure. However, the high Kjeljahl readings occurred on May 21 and June 11, 1993 during the late flow period, and those readings represented only 4% of Pine Creek's 1993 inflow to Eagle Lake.

We acknowledged (p. 25, col. 1, para 1) that nutrients borne on sediment particles were not measured and that such loading had not been evaluated. We have no staff, money, or time to initiate such a study or to make it part of a long term monitoring program. Sediment monitoring at the outlet to Eagle Lake would probably take several years to detect any positive upstream changes from reduced channel erosion, and even then it would be difficult to discriminate between natural sediment yields, transport of sediment released from in-channel storage sites during high flows, and any residual sediment that could be attributed to land management problems. In 1993, we funded a shared-cost study of some paleoecological factors in Eagle Lake and in the Pine Creek watershed. That report has not been received at the Forest. The Desert Research Institute crew was unable to obtain firm sediment cores from the floor of Eagle Lake offshore from the Pine Creek outlet. The lakebed sediments are very fine textured and unconsolidated, and the cooperator believes that they include a large component of aeolean sands, similar to nearby shoreline sand dunes. Pine Creek's annual flows are highly variable, and year-to-year sediment loading variations would mask minor improvements in channel condition. We believe that it makes more sense to monitor the sediment source areas (mainly Champs Flat and McCoy Flat) and our direct effects on them, in terms of improvements in near channel ground cover and in bank stability and erosion trends.

- **Comment:** The revised draft did not address any of the comments from our previous letter relating to hypothesis that there is no nutrient flushing in the spring.

Response: We did not detect any flushing effects in 1987, but DFG 1993 data could indicate flushing effects at PC-1 and PC-2. The best way to verify whether or not there is any nutrient flushing in the early runoff period would be to deliberately sample the flows several times in the first day or two that Pine Creek flows into Eagle Lake at station PC-1. The most efficient way to do that would be to set up an automatic sampler with a stream stage sensor that triggers sampling on the creek's initial rise. Whether or not we got high measurements the first few days of flow, the overall total nutrient load to Eagle Lake would not differ greatly from what was inferred in 1987 or 1993, because the first part of the hydrograph is only a small portion of the total volume of water delivered to the lake over the runoff period.

- **Comment:** Map shows incorrect sampling station numbers. The EA should call the sampling stations "water quality monitoring stations."

  Response: The station numbers for Pine Creek on Figure 1, Appendix D are reversed. PC-1 is the station at the gauging station station/fish trap near the mouth of Pine Creek at Eagle Lake. The numbering for the Papoose Creek stations is correct.

- **Comment:** We still do not understand how the LNF calculated nutrient loads. We are unsure if total Kjeldahl nitrogen loading was included in the amounts shown in Table 1.

  Response: The raw data are summarized on a Microsoft Excel spreadsheet, and the working hydrographs were plotted using Deltagraph Professional. The sampling dates were used to represent proportional sections of the hydrographs. Copies of the pertinent spreadsheet sections and the plotting hydrographs are available on request. We thought it best to include a summary table and conclusions. This EA was not intended to be a paper on the chemistry of Pine Creek and Eagle Lake. The total nitrogen figure for 1993 includes the effects of measured Kjeldahl nitrogen concentrations as a component of the total nitrogen load. The summary table footnotes and column headings are corrected to reflect those in the original hydrologist's report.

- **Comment:** Apparent omission of Kjeldahl nitrogen measurements from estimates and from consideration in the summary conclusions in the EA (pp 24-25).

  Response: As previously mentioned, the Kjeldahl nitrogen loadings were included in the estimates for total nitrogen loadings in 1993. Unfortunately, Kjeldahl nitrogen measurements were not done in 1987. The high Kjeldahl measurements on 5/21/93 and 6/11/93 represent only 4% of Pine Creek's inflow to Eagle Lake, and nine other samples were below limits of detectable levels at station PC-1 in 1993. The positive Kjeldahl measurements were converted to nitrogen loading components, but we could not infer any particular conclusions from their sporadic, late season effects. The Kjeldahl nitrogen readings were discussed in more detail in the hydrologists report, which will become Appendix K in the EA. The statement in the EA concerning the highest total nitrogen and phosphorous are still valid, even considering two high Kjeldahl measurements.

- **Comment:** Disagreement with interpretation of results, especially considering Kjeldahl measurements, including measurements taken on 7/7/93.

  Response: Considering the 1993 data, Pine Creek's chemistry does seem to exhibit a spring flush of dissolved nitrogen and a possible late season buildup of organic nitrogen. That is understandable, considering algae growth and the accumulation of organic debris after dissolved nutrients enter the creek's food chain. We were not furnished any water quality information by DFG after 7/2/93, so the existence of 7/7/94 measurements was unexpected. The occurrence of high Kjeldahl readings on 7/7/93 at stations PC-2 and PC-3 is consistent with the accumulation of organic material during

slow, warmer, late season flows in Pine Creek. Pine Creek did not flow into Eagle Lake after 6/21/93.

- **Comment:** Unfiltered DFG samples included suspended sediment. Nutrient loadings are in violation of basin plan objectives for Eagle Lake and Pine Creek. Recommend that the EA show how these data were used to determine the proposed action for management of the Pine Creek drainage.

  Response: We do not believe that either the Forest Service 1987 data (which were filtered grab samples from the shoreline) or DFG 1993 data (which were unfiltered grab samples) represent the full effect of bedload and suspended sediment transport of nutrients via Pine Creek to Eagle Lake. Normal lab protocols for dissolved nutrient assessment require filtration of samples. We do not know whether or not that was done by the DFG laboratory. Kjeldahl nitrogen evaluation does digest unfiltered residues. However, to fully assess sediment borne loading, either agency would have to take depth-integrated samples along a cross-channel transect to accurately assess suspended sediment effects, and such measurements are difficult during high flows. Also, the bedload would have to be assessed. We would rather say what we did in the EA, which is that, "The amount of nutrients entering the lake on clay and silt sized particles was not measured."

  Pine Creek's present nutrient loading is not violating North Lahontan Basin Plan objectives, which are based on monthly means of measured data for Pine Creek. For the 1993 data at station PC-1 sent to us by DFG, one of eleven samples for total nitrogen exceeded the basin plan objective; for total Kjeldahl nitrogen, two of eleven samples exceeded the objectives; none of the eleven total phosphorous measurements exceeded the objective; none of the dissolved ortho-phosphorous exceeded the objective. The pattern is similar for the other stations–occasional measurements above the objective, but monthly means remain well below the objectives.

  How we used the measurements from 1987 and 1993 was summarized in the EA (p. 25), where we noted that "The management measures most likely to have favorable effects on reducing nutrient loads carried by Pine Creek would be measures to improve in-channel and near channel vegetation and to reduce bank erosion and caving and sheet erosion from nearby rangeland in McCoy Flat and Champs Flat valleys and from Pine Creek Valley."

RIPARIAN HEALTH

- **Comment:** It is acknowledged in the EA that site potentials are largely unknown. Therefore, the prospects of achieving the desired conditions is speculative at best and in many cases may not be attainable.

  Response: Site potential is often speculative and is based upon our best knowledge of these systems and by comparing the sites in question with similar sites elsewhere.

- **Comment:** The six inch or greater stubble height standard to protect fisheries would be acceptable only if there are key riparian flora species which can accommodate such growth at elevations that would provide a growing season for that growth.

  Response: The requirement of 6 inches or greater stubble height for riparian vegetation has been changed to a 4-6 inch stubble height.

- **Comment:** Concern about the riparian pasture description in Reach 8, especially considering the stubble height of 7", which may exceed the normal growth production of some of the plants.

  Response: The riparian pasture prescription has been changed to a 4-6 inch stubble height.

- **Comment:** We are encouraged by your efforts to include the recommendations suggested by Mr. Stubbs in your proposed action. We believe that limiting grazing standards to 30 percent herbaceous and 20 percent woody vegetation utilization will allow for recovery of riparian habitats.

  Response: On December 12, 1994 Keven Stubbs of the USFWS, USFS personnel, and a representative of the CDFG met in Susanville to discuss the proposed project on Pine Creek. At that time, Keven Stubbs recommended 40 percent herbaceous and 30 percent woody vegetation utilization.

- **Comment:** The basic premise of 3 pasture rest rotation grazing system is 2 years rest during the growing season (prior to seed ripe time) after each year of grazing during the growing season.

  Response: Originally rest rotation meant a complete rest for at least one year. It is now believed that plants receive the same benefits when rested during the growing season as with a complete years rest. Annual Operating Plans will address these issues so the decisions can be site specific.

- **Comment:** Forage utilization is not used as a standard or guideline for rest rotation grazing. The utilization standard of 40% may jeopardize the integrity of 40 years if rest rotation.

  Response: The 40% utilization standard identified in the definitions sections of this E.A. refers to the riparian area of Pine Creek.

- **Comment:** Utilization was not discussed and in my opinion was a major omission and will lessen our ability to demonstrate the benefits of our original plan of short duration grazing where the proven ecological tools of herd effect, stock density and long rest periods (95-99% of the year) are secondary to utilization at any given time.

  Response: Many units will still be grazed for short durations. Although the utilization standard will be less than that proposed by some authorities, some of the benefits will still be derived. It also must be recognized that the literature on short duration intensive grazing systems are basically dealing with uplands and not streambanks as we are with Pine Creek.

ADDITIONAL OR MODIFIED ALTERNATIVES

- **Comment:** In Alternative IV-LRMP, the proposed grazing strategy for stream reach 9 and 10 (Lower Pine Creek) is a late graze riparian prescription, which lacks sufficient data to justify the change from a short duration to a riparian prescription, based upon Platts assumptions.

  Response: The Decision Notice documents that Alternative IV will be modified in the following manner:
  Reach 9: The waterhole located in section 32, T32N R9E will be fenced and used as a water-gap by both the north and south pasture. The remaining portion of Pine Creek in Reach 9 will be fenced as an exclosure and not grazed. This will allow the South Pasture of Lower Pine Creek to be grazed as short duration same as the rest of the allotments which will fit into the management of the area.
  Reach 10: Reach 10 is within the North Pasture of Lower Pine Creek allotment. The grazing strategy for this reach is short duration late grazing. It will be changed to short duration with late grazing two out of every three years. Late grazing will be considered anytime after August 10. This will be beneficial to the greater sandhill crane and will still be practical as a grazing management scheme to fit in with the other pastures to be grazed.

- **Comment:** Reach 9 and 21c each are less than .25 miles of stream yet part of a much larger pasture. If they are to be managed differently than short duration, fences and water development must be put in place to allow that.

  Response: For reach 9 see the previous response. Reach # 21 has been divided into three parts 21a, 21b, and 21c. Reaches 21a and 21c are more susceptible to damage by livestock, so 21a will be fenced with 20 and 21c will be fenced with 22 leaving 21b to be grazed as short duration.

- **Comment:** I feel that project 22 (fencing along Hwy 44) should be deferred until Caltrans builds and maintains fencing along State Highway 44 along the full length of the open range.

Response: Alternative IV-LRMP has been modified (See Decision Notice) to drop project 22 until the project becomes a priority for Caltrans.

ENVIRONMENTAL CONSEQUENCES

- **Comment:** Adverse impacts of the proposed projects (Projects 15, 17, 18) is not addressed in the report.

  Response: The Forest Service anticipates no adverse effects from the proposed projects that are not mitigated by incorporated measures or by offsetting effects elsewhere in the chain of improvements up the main channel. The effects of raised temperatures and trash fish behind structure 15 are unlikely for several reasons: (1) Temperature rises would mostly occur after seasonal flows subside and fish are unable to move up the channel below structure 15 anyway; (2) The shallow pool upstream from the structure would be used by wildlife and would serve to improve local meadow subirrigation; (3) The pool behind structure 15 would consist of slowed water held behind a two foot high rise in the existing, incised channel for approximately 1/2 mile upstream (with a maximum surface area under 2 acres); (4) The pool is designed to fill with sediment, leaving a narrow, meandering channel in the reach immediately upstream from the structure after several years; (5) The Department of Fish and Game will not be allowing fish to migrate upstream until brook trout are removed from the perennial, "nursery" reaches above Highway 44 and until channel alignment and culverts are modified near the highway and active Union Pacific railroad grade; and (4) Any residual, holding pool effects would not be notably different from other places in Pine Creek where isolated pools hold through the summer in most years, e.g. in the deeply entrenched reaches below Logan Springs.

- **Comment:** Project 13, "McKenzie Cow Camp, splitter removal" is only half complete. The splitter has been removed but the component to plug the man-made ditch and allow the creek to flow in natural channels has not yet been accomplished. We recommend this project be described separately.

  Response: This is an error, Project 13 should be the removal of the splitter only. Project 19 Project Plan and Construction Projects will include plugging the man-made ditch and allowing the creek to flow in the natural channels.

- **Comment:** The description for Project 21 is different in the table from the project described in Appendix B.

  Response: This was an error. Project 21 is proposed in Alternative I-Platts only. The project is to fence a stretch of Pine Creek identified in Appendix B and to exclude livestock from the area.

- **Comment:** The EA indicates that the nutrient levels will go down with the CRMP alternative and stay at the present levels with the LMP alternative.

  Response: This is an error. It should read, "Total amount of nutrient loading and sediment transport would begin to decrease." Only in Alternative 3-No Action, would the nutrient level remain the same.

- **Comment:** Greatly disagree with the statement on page 40 that states: "The CRMP alternative lacks 3 years rest," as it appears to be a subjective comment.

  Response: This statement may be misinterpreted. It was intended to present differences in grazing strategies, between Alternative 2-CRMP and Alternative 4-LRMP, which is "Rest 3 years, graze 1 of 3 years," in Alternative 4.

- **Comment:** On page 41, the analysis of the labor constraints section stated that the LMP and CRMP alternative requires the same amount of labor. The no grazing by herding (LMP), if enforced strictly, would almost mean that cowboys would constantly have to ride that area during the period of which the cattle are grazing near Pine Creek. And similarly, the LMP 'no grazing by management' strategy provides a nebulous management situation that will only result in conflict.

  Response: Based on the 1994 grazing patterns, "No grazing by management," is obtainable.

- **Comment:** The Platts alternative proposes 8.6 miles of exclosures compared to 4.8 miles under the LRMP alternative.

  Response: The no grazing management strategy will result in the same benefits as the exclosures. When this strategy is added to the LRMP alternative for your comparison, there will be no grazing on 8.6 miles of Pine Creek within the Platts alternative and 7.55 miles within the LRMP alternative.

- **Comment:** Alternatives 1 and 5 will jeopardize the Rest Rotation grazing system for the entire allotment by creating unequal sized pasture units, while alternatives 2 and 4 will have a small effect on pasture sizes. Replacing the water sources eliminated by the fence Project 4 is an integral and essential part of the project.

  Response: Neither Alternative 1 or 5 are being considered for the proposed action. Project 6 will provide water access affected by Project 4.

- **Comment:** Goals and objectives for the project appear to be more explicit but the document still fails to even speculate whether the proposed action or any other alternative will result in providing viable migration and spawning habitat for the de facto endangered Eagle Lake trout.

Response: The objectives listed after the key indicators of the Issues on pages 5 & 6 are symptoms of a healthy stream/riparian habitat. Section V - Environmental Consequences compares the alternatives using the key indicators. We have assumed that if the components which make up a healthy riparian habitat are improved, the habitat as a whole will also improve.

MANAGEMENT OF OTHER RESOURCES

- **Comment:** Past and present effects of timber harvesting and sale improvements and potential effects from proposed harvesting could impact the proposed improvement projects and were not considered.

  Response: The timber harvesting history in the Pine Creek watershed and current proposals for various timber salvage and thinning sales were not included in this EA because we did not believe that those factors would exert any adverse effects on any alternatives. Young (1989, p.6) notes some hydrological effects of past timber harvesting, mainly railroad turnpikes across the valley floors and over Pine Creek in several locations. Those past activities would not affect the restoration project alternatives, except where modification of the railroad grades or road crossings is mentioned. The geography of Pine Creek's watershed includes extensive buffering of upland forest effects by the wide valley bottoms and rocky channel reaches that constitute most of the main channel riparian zones. Sediment from upland areas seldom reaches Pine Creek's main channel, and we do not expect any new adverse effects on water quality or sedimentation from timber harvest areas in any alternative.

- **Comment:** Prior to determining the purpose and need of this EA, it should be determined if the Eagle Lake trout can coexist with the non-native brook trout. This is particularly important, due to the fact that the NFMA requires that both existing native and non-native vertebrate species are managed equally.

  Response: This issue is outside the scope of the EA.

- **Comment:** The proposed projects will not only have an affect on the management practices applied outside the riparian zone, but more importantly, the projects outside the riparian zone will have a tremendous affect on the projects within the riparian zone, i.e. non monitored water drafting.

  Response: The scope of this EA covers the Pine Creek riparian corridor. Further analysis of the Pine Creek watershed will be covered through the Ecosystem Management and project planning process currently under way.

- **Comment:** The Monitoring Plan on Appendix C should include water temperature, water quality and sediment monitoring.

  Response: The Forest Service has limited funding for monitoring many Forest activities. We could not comply with this request without reducing or eliminating other monitoring, e.g. the Eagle Lake water quality monitoring program, the Forest BMP Evaluation Program, riparian zone monitoring in other watersheds, or other ongoing monitoring efforts. Temperature, water quality, and sediment production would be indirect measures of improved riparian vegetation and channel stability. We believe it makes more sense to directly monitor riparian vegetation and channel conditions.

- **Comment:** None of the alternatives list a monitoring plan for "percent cover". This section should describe how this key indicator will be monitored.

  Response: Key indicators are measurements used to analyze differences between alternatives within an analysis. There is nothing to say that each key indicator must be monitored. A decrease in percent of raw or eroding bank will indicate an improvement in vegetation.

- **Comment:** Appendix C still lacks methods for monitoring stream temperatures. We are especially concerned that the previously proposed nutrient and limnological monitoring of Eagle Lake has been excluded from the EA entirely.

  Response: While monitoring stream temperatures is important for assessing momentary effects of fish habitat on fish behavior and reproductive success, temperatures are not very useful for distinguishing effects of changing riparian and stream channel conditions in the valley bottom reaches of Pine Creek. Pine Creek's main channel riparian and channel conditions are somewhat improved over conditions that existed several decades ago, and they are much better than conditions that existed around 1915 after several decades of intensive cattle and sheep grazing, with well over 20,000 head of sheep grazing in the Eagle Lake basin in some years. Livestock numbers are now less than 10% of peak numbers, and numerous miles of fencing and other improvements have been added to the area. The current, ongoing lake monitoring project started in the 1969-1971 period. Long term trends are uncertain, because of the wide variability of contributing factors (especially climate and related surface and groundwater inflow to Eagle Lake). The Forest Service shifted recreation sanitary systems from vault toilets to a flush toilet/sewer system in the early 1970's, using a meadow effluent irrigation system over a mile from the lake. By 1987, the Forest Service sewer system was rebuilt to a zero discharge standard. In spite of those reductions in disturbance and nutrient loading from National Forest System lands, overall water quality in Eagle Lake continues to decline, based on subjective assessment of algal bloom frequencies and/or persistence and accumulation of organic materials on the lakebed.

The water quality monitoring station off Spalding tract is in the middle of the bay, approximately one mile east of the mouth of Pine Creek. Results from that station indicate generally lower clarity (Secchi disk readings) than those from other stations, but phosphate readings are not notably different there than at the other eight stations elsewhere on the lake. Nutrient loading at that station could also include some effects from Spalding Tract septic tank drainage and from seasonal use by large numbers of waterfowl. In 1993/1994, investigators from the Desert Research Institute gathered paleoecological information from several locations on Pine Creek and from the bed of Eagle Lake. Unfortunately, they were unable to extract intact lakebed sediment cores from the bottom of the bay where Pine Creek enters the lake, because of the unconsolidated, fluid composition of the silt-clay bottom sediments. We had hoped to develop objective data about historical and prehistoric sedimentation rates to Eagle Lake. Their written report of findings is pending.

Monitoring in Eagle Lake does not seem to be useful in tracking management impacts to the Pine Creek watershed, because the lake stations cannot discriminate between nutrient sources. The lake sampling gives us only snapshots of the lake's net, momentary water quality conditions, that are affected by point and non-point tributary, lakeshore, and direct sources; by current and previous year's climates; and by current biological processes and populations. Pine Creek's actual contribution to Eagle Lake cannot be assessed without monitoring nutrient loadings in the lower reaches of the creek before it enters Eagle Lake. As previously mentioned, we would rather focus scarce monitoring time and funds on the causative factors that National Forest uses can remedy, namely riparian vegetation and ground cover and (to some extent) channel stability.

- **Comment:** The reliance of percentages and stubble height as a panacea for proper range management is questionable.

  Response: Percentage of forage by dry weight and measurement of stubble height are but two of the methods for monitoring annual use. To monitor trend, permanent photo points were established. Each reach has at least one photo point, with a total of 53 photo points along Pine Creek.

- **Comment:** The monitoring program is inadequate and has no guaranteed funding.

  Response: Monitoring and evaluation of the implementation of Forest Plans are required by 36 CFR 219.12(k). The monitoring program was developed by FS specialists from the various disciplines involved. Funding for adequate monitoring should become a part of the FS regular budget. If adequate funding for monitoring is not appropriated by Congress, plans will be made to provide for monitoring within available resources since this action is required by law.

- **Comment:** As in my comments on the previous draft report this document must contain a "disclosure" statement such as that found on page 8 of 9 of the DFG/SWRCB agreement.

  Response: This has been an error in our part, Let it be known that:

  This project has been funded in part by the United States Environmental Protection Agency using Section 205(j) grant funds under Assistance Agreement S-009567-01-0 to the State Water Resources Control Board and by Agreement No. 1-071-250-0 in the amount of $96,000.00 to evaluate the feasibility of various alternative management strategies in the Pine Creek drainage that can be combined to achieve stable stream banks and thrifty riparian vegetation to reduce discharge of sediment and nutrients into Eagle Lake. The contents of this document do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency or the State Water Resources Control Board nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

- **Comment:** Request for inclusion or availability supporting materials referenced in the EA.

  Response: The itemized materials are available on request, except that we do not have copies of the Department of Fish and Game sampling protocols. Information about the Department of Water Resources Monitoring results and methods are available from their Northern District office, 2440 North Main St., Red Bluff, CA 96080 (telephone 916-529-7300).

- **Comment:** It is not appropriate to include completed projects in a proposed action.

  Response: Completed projects are not listed in the alternatives, they are only shown in the list of "Pine Creek Restoration Projects" on page 15-19. They were included to show the full scope of all recent and proposed actions. The completed actions are certainly part of the "no action" alternative. Including completed projects in this EA was a matter of stylistic preference, within the discretionary authority of the Forest Service in writing this EA.

- **Comment:** This section should be more than an obtuse definition of cumulative effects. Request that information from the 1993 cumulative watershed effects estimate for the Pine Creek Watershed be added to the discussion.

  Response: The discussion on page 41 could be improved. The projects described in this EA's alternatives are designed to create *positive* cumulative watershed effects on Pine Creek and its riparian zone. The hydrologist's 1993 cumulative watershed effects

report answered questions concerning potential negative, cumulative watershed effects in the Pine Creek watershed.

The 1/25/93 cumulative watershed effects report is available on request. Pertinent paragraphs from the cover memo (same date) include:

The results of this analysis supports (the) 1989 contention that the watershed's subbasins are not disturbed above their threshold of concern, with resultant cascading, adverse effects from broad (watershed) areas. Timber harvesting (accounts for) less than 5% of the adverse watershed factors. The problem in the Pine Creek watershed is where you see most of it–in less than 3% of the area.

Long term, concentrated grazing of the riparian zones caused most of the adverse effects, and continued grazing is slowing watershed recovery (to at least some degree) in many cases. However, I would hate to see grazing banned outright in Pine Creek's subbasins, because we would lose one of our few management tools that act on grasslands and because recovery could be retarded by overresting some of the range.

- **Comment:** Request revision of the discussion on pp 41, concerning adverse effects that cannot be avoided.

  Response: The first sentence in this section of the EA should be revised to read, "There will be no unavoidable, adverse environmental effects from implementing the proposed actions. All alternatives involve improved control of livestock distribution, either by fencing or by herding livestock."

- **Comment:** Incomplete or Unavailable Informantion, page 41. Need to add a reference to the available nutrient loading information and to explain how that information was used to select the proposed action. Add the following phrase to the second sentence in the EA: "..., including water quality and temperature measurements on Pine Creek done in 1987 and 1993."

  Response: It is not appropriate in this section to discuss how available information was used in the analysis. This section discusses incomplete or unavailable information and how the analysis proceeded in spite of those uncertainties.

- **Comment:** The project includes no meaningful historic analysis of broad native plant and animal communities and no rehabilitative actions.

  Response: Issue is irrelevant to the decision.

- **Comment:** The project goals are not attainable without new California DFG policy directives concerning the Eagle Lake Trout Hatchery Program.

  Response: This comment is outside the scope of the proposed action.

- **Comment:** Project 24 calls for fencing and developing a riparian pasture by construction three miles of fence. This project is only considered in Alternative 1. Most of the other alternatives call for exclosure of that portion of Pine Creek. The EA should describe how this exclosure will be accomplished.

  Response: The exclosure fences are already in place and were categorically excluded from documentation within an EA therefore the project need not be discussed within this EA.

- **Comment:** Structure 15 will have to be removed if it impedes or prevents free passage of fish in Pine Creek.

  Response: The two foot high structure will be of sealed composition, with a three to one downstream fill angle. It will be shaped to maintain channel integrity, and its effect should be no different than the many bedrock controls at the outlets of McCoy Flat, Champs Flat, and Pine Creek Valley. If the structure prevents fish passage and that obstructing effect cannot be remedied by modification of the structure, it will be removed.

- **Comment:** Omission of discussion concerning potential temperature effects of structure 15.

  Response: We do not believe there will be adverse temperature effects from structure 15 during the main fish passage period. Some temperature increases are likely at the end of the flow period and during the time a remnant, stagnant pool lingers above the structure. (See the response to item 12C, para 1 for more detailed information.) Most of the pool volume will be filled with sediment from upstream bank washing, and the raised water table will foster the growth of improved riparian vegetation. Project 15 has the long term potential to lower stream temperatures from the effects of improved riparian shading and channel narrowing above the structure. Temperature logging at that site would have to be correlated to streamflow quantity and fish migration activity to verify an adverse effect. The Forest Service would agree to remove the structure in the unlikely event that it creates long term, adverse effects.

- **Comment:** Noted presence of trespass cattle in the Project #1 area and wanted to know if their impact had been evaluated.

  Response: Project #1 area is within reach # 5 where some type of grazing is proposed in every alternative except Alternative I.

- **Comment:** Wanted the status of project 6 clarified, since it was shown as "completed" in the project table but "in progress" in the detailed Appendix B narrative.

Response: The project is complete. It has been reduced to one well and trough, with a fencing setup to allow use from either of the nearby allotments, depending on which cattle are in the area.

- **Comment:** In the Champs Flat area; the CRMP alternative is superior to the LMP alternative because it uses intensive grazing that works with timing of grazing and not number of years.

  Response: It is our determination that grazing 1 of 3 years with 40 percent utilization by dry weight, best fits the condition of the stream channel in this reach.

- **Comment:** The Service (USFWS) approves of most of the projects proposed under each alternative, however, a priority system should be developed for completion of these projects in a timely manner.

  Response: A priority system is not discussed within this document, although due to the different avenues of funding and the need to accomplish one project to proceed with another there has been a logical manner in which we have been prepared to proceed.

- **Comment:** I want to make it clear that reaches 17 & 18 have already been rested 2 years (93 & 94) and will be rested again in 95 and grazed in 96. Reach 16 was rested in 94 and will be rested in 95 & 96 and grazed in 97.

  Response: It is recognized that this planning process has taken several years and that implementation of the 3 years rest has already started.

- **Comment:** There is no evidence presented that would indicate the stream channel or riparian habitat of Pine Creek is deteriorated or significantly different today than it was earlier in this century when it was functioning as a successful spawning tributary to Eagle Lake.

  Response: There is wide spread agreement that there is significant room for improvement to riparian conditions and the elimination of fish barriers on Pine Creek.

- **Comment:** Questions that reaches 11 and 13 are worst condition, and that instead, they are near their best potential.

  Response: Reaches 11 and 13 were not broken down separately in the Platts and Jensen report. Much of Reach 11 contains a healthy aspen stand that is made inaccessible by a lava flow which Pine Creek flows through. Reach 13 is similar in geomorphology, but the aspen component is missing.

- **Comment:** The undesirable stream characteristics of reaches 12 and 14 are directly attributable to railroad logging, road building, culverts, and drainage ditches; as well as reach 14 historically be very dynamic in stream course movement.

  Response: While it is true that activities other than livestock grazing contribute to the degrading condition of the stream course, and by not addressing those concerns little improvement may occur, these activities were analyzed to minimize further impact and these reaches were exclosed to improve conditions.

- **Comment:** It's probable that due to the nature of the high spring flows in Pine Creek and the fine textured soil types in the valley bottoms, that "desired condition" for the alluvial/not graded valley bottom type is unattainable.

  Response: This is possible.

- **Comment:** Projects 31 and 32 are necessary so cattle will have alternative water sources other than the valley bottoms.

  Response: These projects are part of the CRMP and LRMP alternatives but not in the others.

- **Comment:** Project 32 is located in Harvey Valley Allotment, not Champs Flat Allotment.

  Response: This was an error on our part and will be corrected.

- **Comment:** CRMP alternative with short duration grazing on Silver Lake Allotment, using no exclosure, is the alternative which best suits all involved and affected in this watershed.

  Response: Short duration grazing was determined to cause too much mechanical damage to the perennial reaches of Pine Creek.

- **Comment:** In Reach 0, Alternative 2, the "Exclosure No Graze" was not recommended by the CRMP. There is no need for fencing in this area as livestock do not care to water in this location. The snow belt precludes our ability to effectively or financially maintain a fence which is one more responsibility this ranch cannot afford.

  Response: Exclosure fencing will not be necessary if the objective can be met with herding management. If livestock use continues in this reach, then the exclosure fence would need to be put in place.

- **Comment:** In Reach 2, the "No Grazing by Management," could leave the Forest Service liable for cattle which cross Highway 44 looking for water.

  Response: The Silver Lake Allotment, presently undergoing analysis in a separate EA for the term permitting process, will provide an allotment management plan to address this issue.

- **Comment:** For Project #20, there is no sensible reason to do this and there is no funding for maintenance.

  Response: This would not occur under the proposed action.

- **Comment:** For Projects #37-38, they are not necessary and too difficult to maintain.

  Response: Project 37 will occur if deemed necessary depending upon livestock use of the areas in question. Project 38 will be maintained by the Forest Service.

- **Comment:** No EA for the structure built in Leaky Louie's Pond, allowing continued use of pond for water drafting.

  Response: The improvement of the watering site at Leaky Louie's Pond was a Knutson-Vandenberg (KV) project covered under the Cone Butte Timber Sale Environmental Assessment.

- **Comment:** Adverse affects that cannot be avoided. Some of the proposed fencing in the high snow level at the higher altitude will require too much additional labor and material for maintenance.

  Response: Any fencing projects included in the proposed action located in areas with heavy snow fall will consist of let-down fence.

California Regional Water Quality Control Board
Lahontan Region

Winston H. Hickox
Secretary for Environmental Protection

Internet Address: http://www.mscomm.com/~rwqcb6
2501 Lake Tahoe Boulevard, South Lake Tahoe, California 96150
Phone (530) 542-5400 • FAX (530) 544-2271

Gray Davis
Governor

May 2, 2000

Alexis Strauss,
Mail Code WTR-1
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco CA 94105

Dear Ms. Strauss:

COMPLETION OF LAHONTAN REGIONAL BOARD'S APRIL 2000 TMDL WORK PRODUCTS

As agreed in our earlier discussion, Lahontan Regional Board staff have completed two sets of April 2000 "deliverables" funded by FY 1999-2000 federal Total Maximum Daily Loads (TMDL) funds. Both of these work products involve development of justification for removal of water bodies from the Section 303(d) list rather than actual TMDLs. Copies of both deliverables have been provided to Janet Whitlock of your staff. The deliverables are:

1. A technical staff report summarizing information on fish habitat restoration in the Pine Creek watershed in Lassen County, and

2. Public draft Basin Plan amendments which would remove the potential Municipal and Domestic Supply beneficial use designation from nine saline or geothermal water bodies, and supporting documents. The draft amendments have been noticed and circulated for a public review period extending from April 26 to June 12, and the Regional Board will consider adopting them at its July 12-13, 2000 meeting.

We also expect to complete and circulate public draft Basin Plan amendments for the Indian Creek Reservoir and Heavenly Valley Creek TMDLs and TMDL implementation plans by June 30, 2000. The public drafts will be submitted to USEPA staff as "technical TMDL" deliverables. Please contact me at (530) 542-5412 if you have any further questions regarding our FY 1999-2000 TMDL commitments.

Sincerely,

HAROLD J. SINGER
EXECUTIVE OFFICER

cc: Stefan Lorenzato, Division of Water Quality, SWRCB
Janet Whitlock, USEPA Region IX, c/o Division of Water Quality, SWRCB
David Smith, USEPA Region IX

JEU/shT:aprilcomm.
[Basin Plan, 2000 Amendments; TMDLs- Delisting 9 waters;
TMDLs- Pine Creek; TMDLs- Indian Creek Reservoir;
nd TMDLs -Heavenly Valley Creek]

File: General
TMDLs
Pine Creek

Staff Report

on

Recommendation to Remove Pine Creek from the 303(d) List

Prepared by

Catherine D. MacDonald
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And

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Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

April 14, 2000

CONTENTS

1. EXECUTIVE SUMMARY

This document will provide background and supporting evidence to recommend removing Pine Creek from the 303(d) list. Central to the question of water quality impairment is the Eagle Lake Trout (ELT). ELT is a unique subspecies of rainbow trout (Oncohrynchus mykiss aquilarium) native to the Eagle Lake watershed in Lassen County. Pine Creek, the largest tributary of the lake, was historically the main spawning stream for ELT. Recently, the trout has attracted the attention of government agencies, fisheries biologists and the public, as the results of approximately one hundred and fifty years of human impact upon the watershed which have left the fish with reduced habitat and no access to their natural spawning area.

The spawning habitat has been adversely affected by human activities including: logging operations and associated road network; livestock grazing; and stream channelization. These problems led to alterations in habitat suitability indices (HSI). The Environmental Protection Agency (EPA) has designated the following parameters as vital to the life cycle of a self sustaining population of fish: temperature, turbidity, velocity, depth, cover, pool/riffle ratio, riparian vegetation, bank stability and siltation (EPA Water Quality Standards Handbook: Second Edition 1994). As of 1997, the fish did not spawn naturally; they were collected in a trap at the Pine Creek estuary and spawned out in hatcheries. This artificial propagation has occurred for almost fifty years, but has allowed large numbers of trout to be stocked each year. It is expected that, following recent completion of a project to restore access to spawning areas, the ELT will be able to spawn naturally. Additionally, numerous projects have been implemented to reduce sedimentation to Pine Creek from land use activities. In the spring of 2000, 50 ELT were tagged with radio transmitters to verify and monitor access to spawning grounds. Another 40 will be tagged in the spring of 2001.

It was these habitat problems that led to the listing of Pine Creek as a "water quality limited segment" under Section 303(d) of the Clean Water Act. For listed water bodies, the State of California must either develop Total Maximum Daily Loads (TMDLs) or provide evidence that control actions are in place to justify delisting. The Lahontan Region Water Quality Control Board (LRWQCB) has collected evidence which supports delisting, rather than development of a TMDL.

There are three agencies which hold the primary responsibility and authority for the land use and resource management of the Eagle Lake Basin: US Forest Service - Eagle Lake Ranger District (USFS), California Department of Fish and Game (CDFG) and US Bureau of Land Management (BLM). The land holdings are split as follows:

Agency	Acres
USFS	40,280
BLM	29,140
Private and County Jurisdiction	57,375

In 1987, the Eagle Lake Ranger District assessed the Pine Creek Watershed and requested additional input from other agencies and individuals. A Coordinated Resource Management Planning Group was formed with representatives from: USFS, CDFG, National Resource Conservation Service (NRCS), LRWQCB, BLM, University of California Cooperative Extension Service, Ducks Unlimited, Eagle Lake Audubon Society, Honey Lake Valley Resource Conservation District, California Trout, private landowners, and grazing permittees with allotments along Pine Creek.

Since 1991, the Pine Creek Coordinated Resource Management Planning Group (CRMP) has been working to create and implement restoration programs for the Pine Creek watershed. Some Technical Review Teams (TRT) have been created to focus on specific areas.

In 1994, two petitions were presented to the US Fish and Wildlife Service (USFWS) to list ELT as a threatened or endangered species on the grounds that it did not have a self-sustaining population. The National Forest Management Act of 1976 requires that "fish and wildlife habitat be managed to where it would sustain a viable population of existing native and non-native vertebrate species" (Miller and Flores, 1998, pg. 4). In order to be officially listed, it had to meet certain criteria according to the Endangered Species Act. The following findings had to be made: ELT habitat had experienced modification; this modification contributed to species decline; disease is a concern because the species is maintained through hatchery operation; concern that existing regulations are inadequate; and/or there are other manmade/natural factors impeding a natural habitat.

The USFWS decided that the petition presented insufficient information regarding fish numbers and did not address recovery efforts being undertaken by the CRMP group. Because numerous goals had been accomplished on habitat restoration, the trout was not found to warrant listing but "will remain a species of concern to the Service." (USFWS News Release, 1995).

This report summarizes the information about the Pine Creek habitat problems and the work of the CRMP group. It was prepared initially to support delisting Pine Creek in the 1999-2000 review cycle for the LRWQCB"s Section 303(d) list. The report has been updated in light of the review cycle delay, and will be submitted to EPA in lieu of the Pine Creek TMDL commitment.

2. WATERSHED CONDITIONS

2a. LAND USES

This section reports on habitat alterations that have taken place within the Pine Creek watershed, in order to provide insight into the needs of the ELT's historical spawning habitat. The circumstances which contributed to the decline of the resource are a combination of: logging practices and associated impacts, livestock grazing, stream channelization, road/railroad grades construction, over-fishing, stocking of exotic species and barriers to fish that do not provide access to spawning habitat. In addition, it is suspected that current climatic conditions have not favored perennial flow of the river (Platts and Jensen 1991 summary pg. i). The alterations in natural habitat conditions brought about near extinction of the ELT in the 1950s. In 1949, the CDFG created a fish trap at the mouth of Pine Creek. The structure was rebuilt in 1956 and remains in use today, operating with the Crystal Lake, Mt. Shasta and Darrah Springs hatcheries. Each year, numerous hatchery-raised trout are stocked into the lake. In 1999, a critical migration barrier was removed, allowing ELT to pass under Highway 44.

Grazing

Grazing has mainly impacted the valley floors along the main channel and tributary streams, causing an overall effect of: vegetation loss, accelerated erosion, increased drainage and possible shortening of the flow period. The depleted riparian vegetation along stream banks has added to bank erosion and widening of stream channels. As channels enlarged, both stream flow and sediment levels increase. Rangeland erosion has been suspected to be a source of nutrient and sediment loading of Pine Creek into the lake. Through the efforts of the CRMP group, grazing has been limited. Presently, a set number of cattle are permitted to graze specific areas, alternate watering sources have been developed, and riparian zone exclusionary fencing has been constructed.

Timber Harvesting

The main effect of timber harvesting is the creation of roads and railroad grades that occupy the valleys. Since the establishment of the Lassen National Forest in 1905, timber has been harvested from the Pine Creek Watershed. In the 1930s and 1940s, large scale logging operations occurred using a network of railroad grades running in and around the valley bottoms. Ditches were created along the rail line to both drain the roadbed and obtain fill for the grade, changing the natural hydrology of the area. In the case of Little Harvey Valley, the outlet was dropped "by six to eight feet...to facilitate railroad logging and construction" (Young 1989 pg. 5). The existing network of dirt roads has historically drawn upon Pine Creek for water during the summer for dust control. Because of the CRMP group, wells have been created for this purpose.

Roads and Railroads

By the 1920s, digging and filling for grades for various modes of transportation was further affecting the area. "Railroad lines were 'turn-piked' across the valley bottoms, using drag lines and buckets to scoop dirt from one side of the line to build the raised railroad grades... When the rail lines either crossed or paralleled Pine Creek or its tributaries in the watershed's major valleys, their hydrologic effect was to lead runoff downstream, to drain the valleys, and to lower local water tables" (ibid.). State Highway 44 and two railroad grades were built directly through the largest meadow in the 1940s. In all likelihood, gravel used to create the fill for the state highway was also taken from a borrow pit from the immediate area

(interview with Larry Moore of Cal Trans 5/1/98). Other railroad grades were created in Little Harvey Valley, Chaps Flat, and McCoy Flat.

All the old railroad grades and borrow pits are no longer utilized, except for the railroad line that crosses the upper end of Pine Creek Valley, just east of Highway 44. In the mid-1970's, Western Pacific Railroad replaced several trestle sections with fill and culverts which has altered flood flows. State Highway 44 has also created a major barrier to fish passage, preventing access to historical spawning grounds. Channelization created two "superditches" alongside the railroad and the highway in order to divert water to the culverts. A superditch refers to a straight run of river designed to maintain super critical flow (straight, smooth, and constant slope). The diversion channel has since incised and is contributing to extensive deterioration of stream and riparian habitat. It is also a major barrier to fish passage, providing no access to historical spawning grounds.

The Fishing Industry

Historically, the ELT has been a valuable fish. In the 1870s and 1880s, massive quantities of ELT were caught on their spring spawning run, and up to 600 pounds at a time were taken by wagon to be sold in Susanville (Miller and Flores 1998, pg. 1). The trout is still caught today and is currently becoming a world famous trophy fish, especially prized for its rapid growth and size. Each year, approximately 160,000 Eagle Lake Trout are stocked into the lake from various hatcheries (CDFG records). In recent years, eggs have been successfully spawned across the United States and around the world. Opening weekend of fishing season - Saturday, May 23, 1998 - was reported to be "one of the best in memory" as there were numerous sizable fish (Lassen County Times 1998). The local economy is provided with an estimated 10 million-dollar annual fishery income (Miller and Flores 1998, pg. 3 and USFS EA pg. 25).

In addition to the ELT, Brook trout is another sport fish. It is unable to survive in the highly alkaline waters of Eagle Lake, but lives in perennial reaches (historical spawning grounds) of Pine Creek. When ELT begin their spring spawning runs, Brook trout are already several inches in size, having spawned in autumn. These fish compete with ELT for resources and space in the spawning habitat.

2b. HYDROLOGIC INVENTORY

The principal tributary stream to Eagle Lake is Pine Creek, which flows into Delta Bay near Half Moon Beach and Sandy Beach on the northwestern side of the lake. The creek drains approximately half of the entire watershed, contributing 75%-85% of the water flow. Several other short, intermittent streams flow into the lake, the largest of which are Merrill Creek and Papoose Creek on the southern end. Most small tributaries are ephemeral, small stream channels in Harvey Valley, Burgess Meadow and Shoestring Draw end in Harvey Valley and do not contribute significantly to Pine Creek. The surface flow contribution to Pine Creek originates from an area much smaller than the topographic basin. Estimates of the size of the topographic watershed vary: 228 square miles (Raymond Vail and Associates (RVA), 1979, vol. 4, pg. 5 and Young 1989 pg. 1) and 222.1 square miles (Platts and Jensen 1991, pg. 4). This report will use an average of 225 square miles.

Pine Creek encompasses an elevation difference of 3,147 feet, beginning at Triangle Lake in the Caribou wilderness of the Sierra Nevada Mountains. From here it flows to Eagle Lake. Estimates vary on the distance: 39.6 miles (Platts and Jensen 1991, pg. 4) and 43 miles (USFS Environmental Assessment (EA) 1995 pg. 20). The area of trout habitat specifically being dealt with is the lower 31.35 miles starting at elevation 6,400 feet and ending at Eagle Lake, approximately 5,100 feet (ibid. pg. 7).

The river flows intermittently through the watershed to terminate in Eagle Lake, flowing most consistently from March to Mid-June. Records indicate a flow average of 120 days per year, though it has ranged from 0 to 242 (Platts and Jensen 1991 pg. 13). Ten to twenty percent of the stream is perennial; portions upstream of State Highway 44 and near the headwaters. Downstream reaches of Pine Creek are intermittent flowing from March to June, mostly as result of snow pack run-off. In summer, the channel dwindles into separated, isolated pool. There is morphological evidence which supports that Pine Creek has flowed perennially in the past (ibid. summary pg. i), though it is unlikely

that this has happened in recorded time of the area. Extensive wetlands may have covered portions of the current sagebrush meadow valley bottoms in the Harvey Valley, Little Harvey Valley, Champs Flat and McCoy Flat allotments.

The United States Geologic Survey (USGS) has stream flow data available for two stations on Pine Creek. Station 10359250, functioning from 1951 to 1978, was about 1.5 miles north of the Bogard Campground and Highway 44. It measured perennial flow from the drainage of the upper 24.8 square miles of the watershed. Average flow was measured at 7 cubic feet per second (cfs.) (ibid. pg. 13). The USGS calculated flood frequencies for Pine Creek near Bogard are: 80 cfs. for 2 year, 185 cfs. for 10 year and 220cfs for 100 year (Jones & Stokes Associates (JSA) 1992 section 2 pg. 4). Station 10359300 was near the CDFG fish trap, about one mile upstream from the mouth of Pine Creek at Eagle Lake. This has measured the flow of the drainage of the entire 226 square mile watershed from 1961 to 1982. Because this is an intermittent portion of the creek, gauged flow ranged from 0 to 150 cfs. (Platts and Jensen 1991 pg. 13). The USGS determined flood frequencies at this station are: 400 cfs. for 2 year, 1200 cfs. for 10 year and 1650cfs for 100 year (JSA 1992, section 2 pg. 4).

In 1992, Jones & Stokes Associates Inc. was contracted to prepare a hydrologic report evaluating threats to fish passage. The reach area was entirely in the Pine Creek Valley, extending from approximately one mile north of Bogard Campground (near USGS gauging station 10359250) to one mile south of two abandoned railroad grades. The following structures were evaluated with respect to fish passage: Splitter structure; USFS road; State Highway 44 (including north, south, middle culverts, ditch #1 and ditch #2); Union Pacific Railroad (UPRR) crossing; Railroad Grade #1; County Road 105; Camp Ten crossing and Railroad grades numbers 2a and 2b.

Little is known about ELT behavior in its natural environment. The JSA report "determined that use of the fish passage criteria developed for Steelhead trout would provide the most accurate assessment of fish passage on Pine Creek" (JSA 1992, section 3 pg. 2). Based on research of information in other scientific studies JSA used the following parameters for evaluating fish passage: overall flow measurements, minimum depth at 0.6 feet and Alaskan Curve for swimming capability with respect to flow velocity. Though many conclusions were made, the most important recommendations were: removal of the splitter structure and re-structuring of ditches #2 and #1. Detailed information can be found in JSA 1992 report: "Fish Passage Criteria" section 3, pgs. 2-4 and "Hydrologic and Fisheries Restoration section 7, pgs. 1-7.

2c. PHYSICAL INVENTORY

This section explains some general physical characteristics of Pine Creek in order to establish the existing and desired habitat parameters. The referenced work serves as a reference for evaluating improvements done by the CRMP group. The following parameters are considered: velocity, depth, cover, pool/riffle ratio, riparian vegetation, bank stability and siltation. Some of these parameters have been frequently surveyed in other reports; this document will reference information from different sources. There will be a primary focus on the USFS 1995 EA.

Additional morphology has been done by students from the University of California at Chico and Davis, under the direction of Dr. Peter B. Moyle Research has primarily focused on fish populations in Pine Creek, but reports include habitat parameter measurements from 1986, 1988, 1990 and 1994 (see references or biological inventory for further information).

In 1990 a USFS survey was conducted along the lower portion of Pine Creek, beginning at 31.5 miles from Eagle Lake and ending at the mouth. The goal was to inventory the area according to USFS Region 5 Fisheries Habitat Assessment methodology. This following information, adapted from the USFS 1995 EA, represents an overall survey of Pine Creek: Pool:riffle:flatwater ratio - 20:15:65, Average pool frequency: 118 feet, Dominant pool type: lateral scour, log formed, Average stream shade: 19% -69 %, (overall 49%) Stream substrate composition average: 11 % boulders, 26 % cobble, 42 % gravels, 13 % sand and 8 % fines.

Specifically, five valley bottoms conditions are described in Platts 1991. Three of these are re-described in the 1995 USFS EA, using 24 smaller reaches to better describe the area. Also, Platts's description of an ideal valley bottom was utilized as the desired valley bottom for Pine Creek. The three main valley bottom types are: fluvial/V-shaped, alluvial/graded, and alluvial/non-graded. Each will be discussed. The following information is adapted from the Platts 1991 and Forest Service 1995.

"Fluvial /V-Shaped"
Reaches 2-4, 11, 13, 15, 21b and 24
This valley type is found in the downstream half of Silver Lake, approximately half of Harvey Valley, and almost all of the downstream portion of North Eagle Lake.
The following describes the desired condition. "Streambanks should be stable and overhanging. Levees and floodplains should extend across the valley-bottom. Soils may vary, ranging from bouldery loam to gravelly loam with dark colored surface horizons. High quality pools should be common and associated with boulder drops or fallen aspen and pine. Willows with sedge and/or mesic grass understory should be common along the stream channels. Aspen communities associated with conifers, including lodgepole pine, and mesic grass understory should be common on higher and drier positions along the flanks of the valley bottom..." (USFS EA 1995 pg. 21).

The following describes the existing condition: "Platts has described three condition states of Pine Creek Channel: eroded banks, over-broadened, and blown-out, with the latter considered most deteriorated. Nearly 60 percent of this [valley bottom] is in the "blown-out" stage where the stream channel is characterized as an over-broadened "dished-out" channel resulting from the elimination of overhanging vegetation and banks. Conditions are such that unstable sediments are eroded and washed out of the valley bottom during high flow periods. Stream flows are ephemeral and riparian vegetation is absent" (ibid.).

"Alluvial/Graded"
Reaches 7-9
This valley bottom type is found mostly in the upper and lower Pine Creek Valley, the historical spawning area for the ELT. This allotment has experienced much human impact and there are many barriers to fish passage.

Because no examples of the natural state exist, Platts' hypothesis is utilized as the desired condition, which is described as follows: "Drainage will follow shallow swales filled with marsh and wet meadow vegetation that release water slowly throughout the year. Wet meadow and marsh vegetation should probably make up a significant portion of the valley-bottom. The wetland vegetation should enhance on-site water storage, and impede snowmelt runoff and serve to extend the flow period. Mesic grass meadows should occur on the slightly higher and drier positions. (ibid. pg. 22).

The following describes the existing condition: "Platts described three condition states; natural, eroded channel, and dished-out, with the latter in the most deteriorated state. In this [valley bottom] 95 percent of the main stem is in the worst condition as described in the following. On-site water storage and retention of snowmelt have been reduced in these areas due to the elimination of wet meadow and marsh vegetation. Sagebrush has encroached into grassy meadows. Channels are "dished-out" with little vegetative cover and water retention capacity, which further accelerates snowmelt runoff" (ibid.).

In 1992 JSA made a study of the Pine Creek Valley with regards to man-made barriers to fish passage. A sinuosity of 1.5 is the used division value between meandering and straight channels. The sinuosity value of a channel is defined by the ratio between the thalweg length and down-valley distance.

"Alluvial\ Non-graded"
Reaches 1, 5-6, 12, 14, 16-20, 21a, 21c, and 22
This valley-bottom type is found in the upstream portion of Silver Lake, the extreme upper part of Pine Creek Valley, approximately half of Harvey Valley, all of Champs Flat, and the upstream portion of North Eagle Lake.

Because no examples of the natural state exist, Platts hypothesis is utilized as the desired condition, which is described as follows: "Gleyed soil horizons, formed under permanently saturated conditions, were observed within a foot of the surface along stream banks in Champs Flat and McCoy Flat. This indicates that stream channels were once graded, probably with wet meadow and marsh vegetation adjacent to the stream channel. Alluvial aquifers may have extended across most of the bottoms. Wet meadow and marsh vegetation probably made up a significant portion of the valley bottom. Wetland vegetation enhanced on-site water storage, impeded snowmelt runoff and served to extend the flow period. Mesic grass meadows probably occurred on slightly higher and drier positions" (ibid. pg. 23).

The existing condition is as follows: "Three condition states have been described; eroded banks, incised, and blown-out. Nearly 80 percent of the channel in this [valley bottom] is severely degraded or blown out characterized by the following. On-site water storage and retention of snowmelt have been reduced due to the reduction of wet meadows and marsh vegetation. Increased erosive potential and accelerated runoff has caused channel incision. Channels are broadened due to failure of dry stream banks." (ibid.).

3. BENEFICIAL USES

The following explains the beneficial uses and potential uses for "Perennial Stream" Pine Creek in the 637.31 HU No. "Antelope Mountain Hydrologic Subarea."

Municipal and Domestic Supply
Currently, Pine Creek is not utilized as a source of water for domestic purposes and it is not likely that it will be drawn upon, though this remains a possibility.

Agricultural Supply
Grazing is the predominant agricultural practice in Pine Creek, and has drawn on the creek for stock watering. Support of vegetation for range grazing is also considered. Overall impacts of livestock grazing are controversial and cited references reflect different viewpoints. Various reports referenced conclude that Pine Creek suffers from various problems, including livestock grazing. Grazing impacts on trout habitat, according to USFS 1995 EA, are described under physical inventory.

"Livestock grazing is the most important agricultural use in the Eagle Lake Basin and Planning Area." (Lassen County Plan 1982). The areas most heavily used for livestock grazing (including Pine Creek) are owned and/or managed by the USFS, BLM, private timber companies and private cattle ranches. Range management practices have been amended to support optimum levels of livestock grazing and improve the quality and extent of the ELT habitat.

"The quantity of nitrogen and phosphorus from the metabolic wastes of this number of animals is undoubtedly large. It is unlikely, however, that any appreciable amount of nitrogen or phosphorus that is deposited on the land reaches surface streams, ground water or the lake itself...the nutrients that enter the soil are probably taken up very rapidly by range vegetation... (LRWQCB, 1981)

Ground Water Recharge
Pine Creek contributes to the groundwater supply and replenishment within the Eagle Lake watershed. Estimates of groundwater inflow range from 23 percent to 53 percent and averages at 28.5 percent of total inflow into Eagle Lake (RVA vol 4 pg. 26). Calculations based on acreage indicate that Pine Creek can not be adequately supplying of all this groundwater recharge. Other sources are speculated to be Madeline Plains and Grasshopper Valley (ibid. pg. 27).

Freshwater Replenishment
Pine Creek is received by Eagle Lake, and is the biggest source of total fresh water surface inflow, contributing somewhere between 75 percent and 85 percent (Young 1988 pg. 1). Recent estimates calculate approximately 85 percent (Cooperative Approach to ELT enhancement 1994). Since Eagle Lake is a closed basin, water quality of Pine Creek should be considered. Eagle Lake is Section 303 (d) listed for eutrophication (organic enrichment and low DO). Prior to listing, Eagle Lake suffered a fish kill due to low DO.

Water Contact Recreation
Though it is perennial, Pine Creek is fit for use as a swimming hole in certain areas, and white water activities, for instance, could potentially take place during spring flows. Further improved flows could open it up to more of these possibilities.

Non –contact Water Recreation
Hiking, picnicking, mountain biking take place in the watershed. There are numerous campgrounds.

Commercial and Sport fishing
No commercial harvesting takes place, but the ELT sport fishing industry provides the local economy with about 10 million dollars (Miller and Flores 1998 p.3).

Cold Freshwater Habitat
Pine Creek is a source of freshwater that could support a cold water fishery of ELT. Currently, it provides habitat to many native species that are considered part of cold water ecosystems, but are not considered in this report.

Wildlife Habitat
Pine Creek is crucial because it provides a habitat of riparian vegetation that is a source of food for wildlife. Native pronghorn and mule deer have been known to graze in the meadows and other animals use it as a resting area before continuing a migratory journey.

Preservation of Biological Habitats of Special Significance
Though this area is not officially designated as a refuge or sanctuary, the ELT is a species of special significance that is promoted as a candidate for Endangered Species listing. Pine Creek could be considered as supporting the beneficial use of a natural spawning habitat.

Rare, Threatened or Endangered Species
Pine Creek supports the habitat of many species. The American peregrine falcon and the bald eagle are both listed as federally endangered species. The USFS has listed some species as Region 5 Sensitive Species. A petition was presented the ELT for listing as an endangered species, but was denied.

Migration of Aquatic Organisms
The ELT is the only aquatic life known to migrate from the lake into Pine Creek. There are other smaller creeks that flow into the lake, but Pine Creek provides the only suitable amount of flow and upstream spawning habitat.

Spawning, Reproduction and Development
The perennial reaches of Pine Creek are the only suitable spawning habitat, as there are no other substantial sources of freshwater for the fish to migrate to, and year round water is necessary for the juvenile fish to over-winter in. Riparian vegetation should be restored for fish habitat and for the numerous terrestrial arthropods that the trout rely on for food.

4. IMPROVEMENTS

In 1985, the CRMP group was created to address the management of the Pine Creek watershed (delineated from the Eagle Lake watershed). In 1994, the goal of restoring a natural ELT fishery in Pine Creek was added. In 1991, the CRMP group created several technical review teams to focus on specific areas: Splitter, Champs Valley, Harvey Flat, Silver Lake, Lower Pine Creek, Upper Pine Creek, and North Eagle Lake.

Several grants have enabled the CRMP group to commission private consulting firms and conduct more studies. White Horse Associates (Platts and Jensen) were hired to evaluate Pine Creek and form recommendations for improvement. Jones and Stokes Associates were hired to create a hydrologic report of fish passage problems and potential solutions in the Pine Creek Valley. In 1995 the "Pine Creek

Riparian and Fish Improvement Project" Environmental Assessment was published by the USFS in cooperation with the CRMP group. It evaluated the activities, general environment within the Pine Creek watershed, and progress of restoration.

As of November 1997, over 40 restoration projects to address habitat dergradation have been completed, documented and monitored. Physical, biological and chemical inventories function as a reference for gauging the work of the CRMP group with respect to their own goals and the overall focus of restoring a natural ELT fishery and providing the species with the historical spawning habitat. Currently, the CRMP group conducts a yearly walking tour of areas within the Pine Creek watershed. These tours help determine progress of projects and areas which may need more attention in the future. Important work completed between 1997 and the present include:

CalTrans, while renovating State Highway 44 in the summer of 1999, agreed, at their cost, to replace the existing culverts with ones that provide fish passage and help restore Pine Creek to its natural channel. This work was successfully completed in the fall of 1999. Burlington Northern Railroad (formerly Union Pacific Railroad) crossed a section of channel which was also a barrier to fish passage. A ditch running along the grade of the railroad offered no shade, pools or habitat for terrestrial arthropods. Removal of the barrier and restoration of the channel was also completed in 1999.

In order to determine the successful passage and spawning of the ELT with these barriers removed, USFS and CDFG have organized a fish telemetry project. The tagging and monitoring of up to fifty fish has been completed prior to the 2000 spawning migration in order to understand passage into the perennial reaches of Pine Creek. It is planned that an additional 40 fish will be tagged next year, providing insight into potential fish passage barriers (Paul Chappell, Personal Communication, 1998 and 2000).

The USFS has set up numerous transect sites which are being monitored by photos. Depending on the site, the photo cycle varies from bi-annually to once every five years. These photos will document improvements over a long time span. (Teresa Pustejovsky, Personal Communication, 1988 and 2000). Through the efforts of the CRMP group, range management practices have been amended to support optimum levels of livestock grazing, improve the extent of the ELT habitat and encourage riparian vegetation. An updated report will be prepared by the CRMP committee to document the progress on project implementation and monitoring completed between 1997 and the present. This report is due to be completed in June of 2000 (David Lile, Personal Communication 2000)

5. CONTROLS:

Is Pine Creek meeting water quality standards? The standard in question is the support of beneficial uses, Specifically: Cold Freshwater Habitat; Spawning, Reproduction, and Development; and Migration of Aquatic Organisms. Pine Creek was listed on the quantitative basis that there was no ELT use of Pine Creek at that time. No conclusive numerical evidence has been analyzed to support delisting, therefore the answer to the question "Is Pine Creek meeting water quality standards?" is no. However, the nature of the impairment is cumulative over time (sediment contributions from land use) and is structural in nature (well described obstructions to fish passage). Both of these sources of impairment have been systematically removed according to an ongoing schedule fixed by the CRMP in response to USFWS's designation of ELT as a species of concern.

Are controls in place or firmly scheduled which will be sufficient to meet standards? Yes. Numerous agencies including CDFG, USFWS, USFS, and the CRMP intend to continue implementing improvements formalized in planning documents. LRWQCB intends to continue to be an active partner in the CRMP ensuring the protection of beneficial uses through full use of our regulatory authority.

Are the controls specific to the water body, the impairment and the pollutant? Yes. Continued implementation of CRMP sponsored projects include road closures, alternative livestock watering sources, riparian exclosure, fencing, changing grazing regulations, fish barrier removal, restoration, livestock control among others. These completed and proposed projects are formalized by agency commitments and

therefore represent controls. Each of them are appropriate to the impairment and specific to Pine Creek in design and implementation.

Is the stringency of the controls analytically supported? The effectiveness of each individual treatment has been thoroughly documented in published literature. Ultimately, the radio telemetry study will support or disprove the effectiveness of the removal of migration barriers. Successful spawning and rearing will prove the effectiveness of habitat improvements. Presently, a barrier still exists at the point where ELT are artificially spawned. If the radio-tagged fish are observed to be migrating, spawning and reproducing successfully, passage will be constructed around the trap, and the trout to reproduce naturally. Consistent with the evidence used for listing, the basis for delisting is sufficiently analytical.

6. RECOMMENDATION:

Regional Water Quality Control Board Staff recommend the removal of Pine Creek from the 303(d) list. This recommendation is based on the evidence summarized in this report and in the supporting documents and references.

7. REFERENCES AND SUPPORTING DOCUMENTS

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Personal Communication: Larry Moore; CalTrans, Teresa Pustejovsky; USFS, Paul Chappell; CDFG David Lile; UCDavis, Staff; LRWQCB.

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Date: 7/15/98
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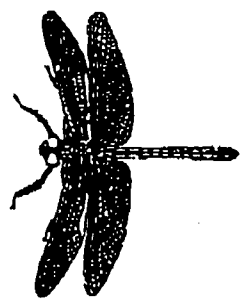
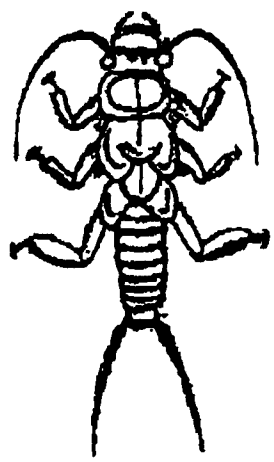
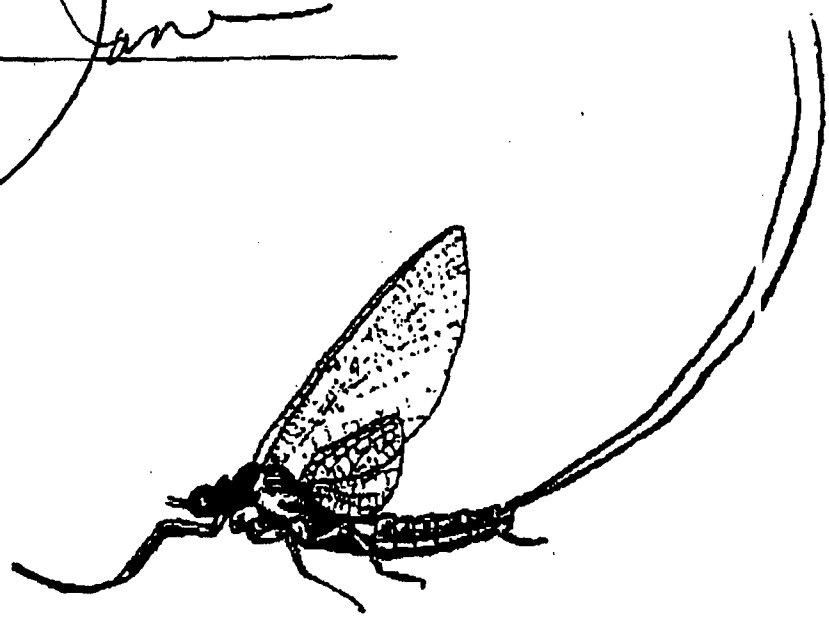
Message Here it is
Good Luck -
Please Send me The
Report

Thanks

Jane







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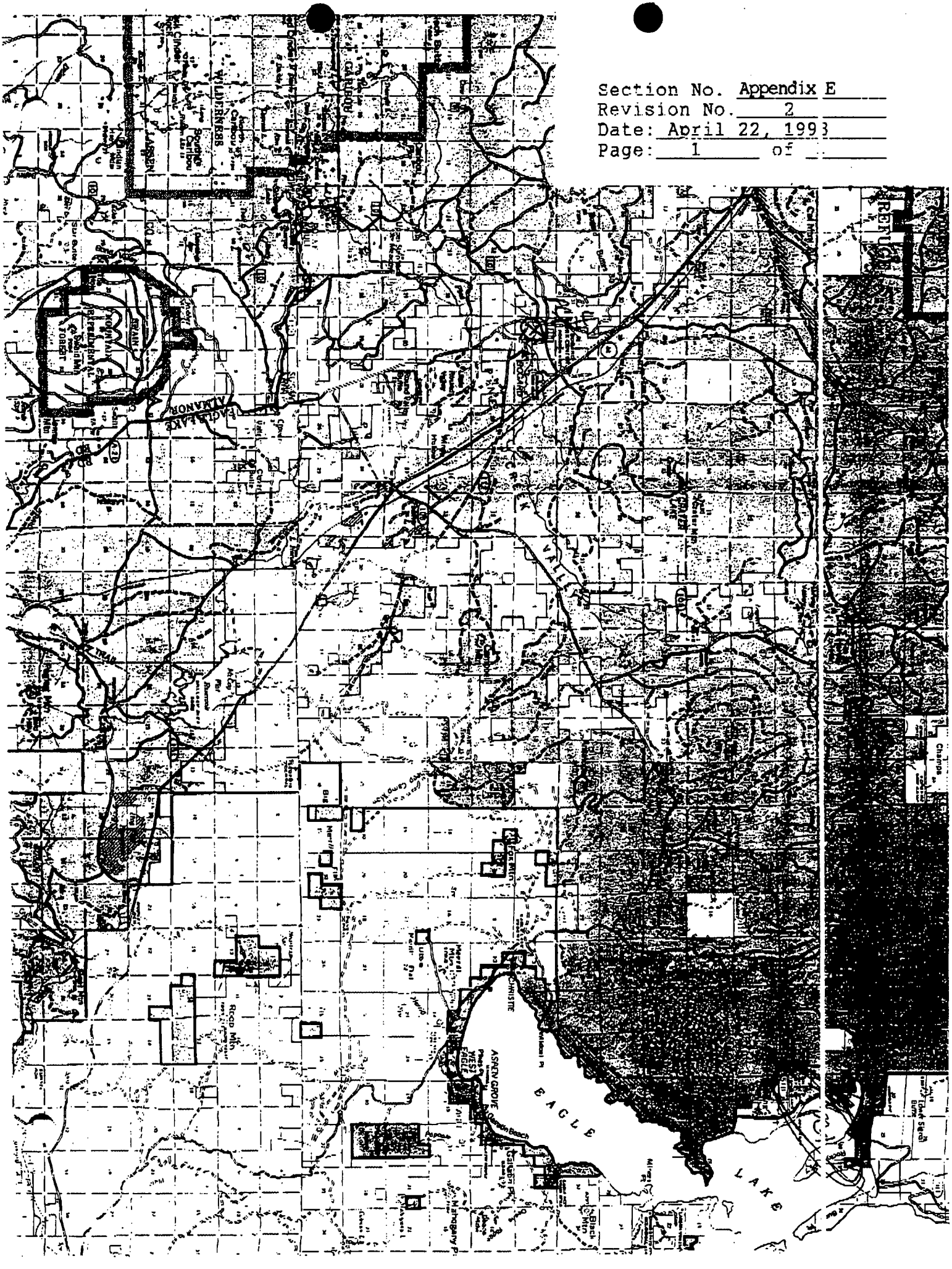

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Completed

Pine Creek Sampling - 1993

	Date	Sample Number	Time	Temperature Air (F)	Temperature Water (F)	pH	Settleables mg/l	Suspended Solids mg/l	Total Phosphorus as P mg/l	Ortho-Phosphate as P mg/l	Dissolved Phosphorous as P, mg/L	Dissolved Ortho-Phosphate as P, mg/L	Total Ammonia as N mg/l	Nitrate plus Nitrite as N mg/l	Total Kjeldahl Nitrogen mg/l
Site 1	04/02/93	PC 1.1	1700	---	---	---	---	30	0.07	<0.01	---	---	<0.03	0.32	<0.5
Site 2	04/02/93	PC 2.1	1050	---	---	---	---	40	0.06	<0.01	---	---	<0.03	0.32	<0.5
Site 3	04/02/93	PC 3.1	0930	---	---	---	---	17	0.02	<0.01	---	---	<0.03	0.08	<0.5
Site 4	04/02/93	PC 4.1	1400	---	---	---	---	2	<0.01	<0.01	---	---	<0.03	<0.01	0.54
[redacted]															
Site 1	04/09/93	PC 1.2	1425	50.6	46	7.5	<0.01 mg/l	22	<0.01	<0.01	---	---	<0.03	<0.01	<0.5
Site 3	04/09/93	PC 3.2	0910	39.8	37	7.6	<0.01 mg/l	24	<0.01	<0.01	---	---	<0.03	<0.01	<0.5
Site 4	04/09/93	PC 4.2	1135	50.4	32.5	7.7	<0.01 mg/l	11	<0.01	<0.01	---	---	<0.03	<0.01	<0.5
Site 1	04/16/93	PC 1.3	1600	55	50.5	7.6-7.8	<0.01 mg/l	15	0.05	0.02	---	---	<0.03	<0.01	<0.5
Site 4	04/16/93	PC 4.3	0800	30.6	33	7.7-7.8	<0.01 mg/l	10	0.03	<0.01	---	---	<0.03	<0.01	<0.5
Site 1	04/23/93	PC 1.4	1545	43.6	48	7.1	<0.01 mg/l	8.6	0.04	0.02	---	---	<0.03	<0.01	<0.5
Site 4	04/23/93	PC 4.4	0815	34.1	32.5	7.2	<0.01 mg/l	4.6	0.02	0.02	---	---	<0.03	<0.01	<0.5
Site 4	04/23/93	PC 4.4	0815	Blank	---	---	---	<1.0	<0.01	<0.01	---	---	<0.03	<0.01	<0.5
Site 1	04/29/93	PC 1.5	1330	62.8	63	7.5	0.2	8	0.04	0.02	---	---	<0.03	0.02	<0.5
Site 2	04/29/93	PC 2.5	1530	61.2	65	7.1	0.2	10	0.04	0.01	---	---	<0.03	<0.01	<0.5
Site 4	04/29/93	PC 4.5	1800	46.1	35.2	6.9	0.3	10	0.02	<0.01	---	---	<0.03	<0.01	<0.5
Site 1	05/14/93	PC 1.7	1430	69.3	61.5	7.4	<0.01 mg/l	5.1	0.04	<0.01	0.04	<0.01	<0.03	<0.01	<0.5
[redacted] 2	05/14/93	PC 2.7	1300	65.2	57.5	7	<0.01 mg/l	5.2	0.05	<0.01	<0.01	<0.01	<0.03	<0.01	<0.5
[redacted] 3	05/14/93	PC 3.7	1130	52.5	52.5	6.5	<0.01 mg/l	5.6	0.07	<0.01	<0.01	<0.01	<0.03	0.14	<0.5
Site 4	05/14/93	PC 4.7	0930	54.1	37	7.8	<0.01 mg/l	3.6	0.05	0.03	---	---	<0.03	<0.01	<0.5
Site 4	05/14/93	PC 4.7	0930	Blank	---	---	---	<1.0			<0.01	<0.01	---	---	---
Site 1	05/21/93	PC 1.8	1345	61.5	64.6	8.2	<0.01 mg/l	7.4	0.05	0.01	0.05	0.01	<0.03	0.02	0.5
Site 2	05/21/93	PC 2.8	1312	57.9	59.9	7.9	<0.01 mg/l	8.1	0.04	0.02	0.01	<0.01	<0.03	<0.01	<0.5
Site 3	05/21/93	PC 3.8	1215	58.1	55.8	7.2	<0.01 mg/l	10.1	0.05	0.02	0.01	<0.01	<0.03	0.04	<0.5
Site 4	05/21/93	PC 4.8	1030	57	39.7	7.7	<0.01 mg/l	3.4	0.03	0.03	<0.01	<0.01	<0.03	0.02	<0.5
Site 1	05/28/93	PC 1.9	1445	58.5	61	5.8	<0.01 mg/l	11.4	0.03	0.01	0.03	0.01	<0.03	0.1	<0.5
Site 2	05/28/93	PC 2.9	1300	54.7	56.3	6.2	<0.01 mg/l	11	0.02	0.02	0.02	<0.01	<0.03	0.02	<0.5
Site 3	05/28/93	PC 3.9	1200	50.4	54.9	6.4	<0.01 mg/l	14.8	0.02	<0.01	<0.01	<0.01	<0.03	0.04	0.5
Site 4	05/28/93	PC 4.9	1000	47	42.4	6.4	<0.01 mg/l	3	0.01	<0.01	<0.01	<0.01	<0.03	0.07	<0.5
Site 4	05/28/93	PC 4.9	1000	Blank	---	---	---	<1.0	<0.01	<0.01	<0.01	<0.01	<0.03	0.02	---

	Date	Sample Number	Time	Temperature Air (F)	Temperature Water (F)	pH	Settleables	Suspended Solids	Total Phosphorus as P	Ortho-Phosphate as P	Dissolved Phosphorous as P, mg/L	Ortho-Phosphate as P, mg/L	Total Ammonia as N	Nitrate plus Nitrite as N	Total Kje Niti
ite 1	06/04/93	PC 1.10	1330	56.5	58.3	6.5	<0.01 mg/l	8	0.03	0.01	0.03	<0.01	<0.03	<0.01	<0.5
ite 2	06/04/93	PC 2.10	1220	54.1	56.7	6.7	<0.01 mg/l	3	0.03	0.01	<0.01	<0.01	<0.03	<0.01	<0.5
ite 3	06/04/93	PC 3.10	1120	50.9	54.7	6.8	<0.01 mg/l	10	0.04	0.02	<0.01	<0.01	<0.03	<0.01	<0.5
ite 4	06/04/93	PC 4.10	0945	47.1	43.9	6.8	<0.01 mg/l	4	0.02	0.03	<0.01	<0.01	<0.03	<0.01	<0.5
ite 1	06/11/93	PC 1.11	1305	60.4	67.4	6.9	<0.01 mg/l	8	0.04	0.02	0.03	0.02	<0.03	<0.01	0.98
ite 2	06/11/93	PC 2.11	1215	53.8	61.7	7.0	<0.01 mg/l	7	0.04	0.02	<0.01	<0.01	<0.03	<0.01	0.52
[redacted]2	06/11/93	PC 2.11	1215	Blank	---	---	---	<1	<0.01	0.01	<0.01	<0.01	<0.03	<0.01	---
ite 3	06/11/93	PC 3.11	1125	53.2	62.8	6.8	<0.01 mg/l	6	0.03	<0.01	<0.01	<0.01	<0.03	<0.01	<0.5
ite 4	06/11/93	PC 4.11	1005	55.4	45.3	7.0	<0.01 mg/l	9	0.02	<0.01	<0.01	<0.01	<0.03	<0.01	<0.5
ite 1	06/18/93	PC 1.12	1330	77.7	76.1	7.6	<0.01 mg/l	5	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.05
ite 2	06/18/93	PC 2.12	1255	64.8	72	7.5	<0.01 mg/l	3	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.05
ite 3	06/18/93	PC 3.12	1210	66.9	69.3	7.4	<0.01 mg/l	3	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.05
ite 4	06/18/93	PC 4.12	1035	60.6	48.7	7.4	<0.01 mg/l	4	<0.01	<0.01	0.03	<0.01	<0.03	<0.01	<0.05
ite 1	06/25/93	PC 1.13	1330	71.1	NO WATER		---	---	---	---	---	---	---	---	---
ite 2	06/25/93	PC 2.13	1255	74	72.9	7.8	<0.01 mg/l	1	0.03	<0.01	0.02	<0.01	<0.03	<0.01	<0.05
ite 3	06/25/93	PC 3.13	1200	74.5	71.1	7.7	<0.01 mg/l	<1	0.04	0.01	<0.01	<0.01	0.05	<0.01	<0.05
ite 4	06/25/93	PC 4.13	1030	69.1	47.1	7.4	<0.01 mg/l	2	0.02	0.01	<0.01	<0.01	<0.03	<0.01	<0.05
ite 1	07/02/93	PC 1.14	1450		NO WATER		---	---	---	---	---	---	---	---	---
ite 2	07/02/93	PC 2.14	1410	62.2	74.5	6.8	<0.01 mg/l	4	0.08	0.05	0.06	0.05	0.07	0.03	0.63
ite 3	07/02/93	PC 3.14	1320	72.9	76.1	7.9	<0.01 mg/l	4	0.05	0.01	0.03	<0.01	0.04	0.02	0.71
[redacted]4	07/02/93	PC 4.14	1145	68.9	51.1	7.4	<0.01 mg/l	<1		0.01	0.03	<0.01	<0.03	<0.01	<0.05
ite 4	07/02/93	PC 4.14	1145	Blank	---	---	---	<1	<0.01	<0.01	<0.01	<0.01	<0.03	<0.01	<0.05

Measurement of the time it took for a floating piece of wood to move 30 feet through a 60 inch culvert along with the head space in that culvert. Culvert I.D. was made by starting on the right bank when looking downstream and moving toward the left bank.

	Head	Flow Rate In Seconds			
Date - 04/14/93 Time -	space (inch)	First Reading	Second Reading	Third Reading	Average Flow Rate
Right Bank Culvert	19.20	18.50	19.00	18.69	18.73
Second Culvert	30.60	14.07	14.94	15.50	14.84
Third Culvert	29.76	13.25	13.41	12.25	12.97
Left Bank Culvert	25.20	16.28	14.10	14.81	15.06
Date - 05/21/93 Time -					
Right Bank Culvert	20.75	24.14	26.74	23.74	24.87
Second Culvert	26.13	19.80	22.38	21.44	21.21
Third Culvert	30.40	14.89	15.28	14.81	14.99
Left Bank Culvert	32.50	18.43	18.90	18.14	18.49
Date - 05/28/93 Time - 1115					
Right Bank Culvert	21.00	23.80	22.47	22.60	22.96
Second Culvert	32.50	17.57	15.90	16.48	16.65
Third Culvert	30.38	14.38	14.18	14.66	14.41
Left Bank Culvert	27.13	20.45	16.87	17.76	18.36
Date - 06/04/93 Time - 1040					
Right Bank Culvert	19.00	20.04	24.86	22.37	22.42
Second Culvert	30.25	16.13	16.46	17.07	16.55
Third Culvert	28.25	13.93	15.81	14.10	14.61
Left Bank Culvert	25.00	19.38	17.19	16.94	17.84
Date - 06/11/93 Time - 1050					
Right Bank Culvert	26.00	44.34	50.04	35.73	43.37
Second Culvert	37.80	31.50	35.68	30.25	32.48
Third Culvert	35.75	26.59	29.62	31.68	29.30
Left Bank Culvert	32.14	38.25	36.95	42.83	39.34
Date - 06/18/93 Time - 1140					
Right Bank Culvert	31.50	58.77	60.36	72.46	63.86
Second Culvert	43.50	57.28	63.35	57.89	59.51
Third Culvert	41.75	60.08	53.50	50.69	54.76
Left Bank Culvert	37.50	73.57	75.17	69.97	72.90

Measurement of the time it took for a floating piece of wood to move 30 feet through a 60 inch culvert along with the head space in that culvert. Culvert I.D. was made by starting on the right bank when looking downstream and moving toward the left bank.

	Head space (inch)	Flow Rate In Seconds First Reading	Second Reading	Third Reading	Average Flow Rate
Date - 06/25/93					
Time - 1115					
Right Bank Culvert	34.88	83.75	117.80	90.18	97.24
Second Culvert	46.50	129.34	126.96	92.22	116.17
Third Culvert	45.00	115.14	99.27	91.54	101.98
Left Bank Culvert	41.00	101.20	99.48	100.17	100.28
Date - 07/02/93					
Time - 1115					
Right Bank Culvert	38.25	n/a			
Second Culvert	49.00	n/a			
Third Culvert	47.50	n/a			
Left Bank Culvert	44.50	n/a			

STATE OF CALIFORNIA - BUSINESS, TRANSPORTATION, AND HOUSING AGENCY PETE WILSON, *Governor*
DEPARTMENT OF TRANSPORTATION
DISTRICT 2 Office of Encroachment Permits
P. O. BOX 496073, REDDING, CA 96049-6073
FAX (530) 225-3097
PHONE (530) 225-3400

Re: 02-Las-44-14.7/37.2
02-206-258280
Bogard Structural Repair

May 1, 1998

Ms. Alex Lutz
Regional Water Quality Control Board
Lahontan Region
280 Island Avenue # 1002
Reno NV 89501

Dear Ms. Lutz:

Pine Creek Documentation

As we discussed, attached are copies of the letters that document the decisions regarding providing fish passage for the Eagle Lake trout under Route 44 at Pine Creek. I have also attached a copy of the preliminary plan sheet showing this area. If there is anything else you require for your report, please call me at (530) 225-3144.

Sincerely,

Lawrence T. Moore

LAWRENCE T. MOORE, P.E.
Hydraulics Engineer
District 2

Attachments

Project Files

Phone: 916-225-3144

02 Las-44-14.7/37.2
02-206-258280
Bogard Structural Repair

June 21, 1995

Mr. Glenn Nader, Coordinator
Pine Creek Coordinated
Resource Management Plan
County of Lassen
Memorial Building
1205 Main Street
Susanville, CA 96130

Dear Mr. Nader:

Pine Creek Hydraulics

Attached are copies of culvert information and hydraulic calculations that will be useful in negotiating with Western Pacific regarding upgrading the south crossing of Pine Creek under the railroad near the Bogard Ranger Station. As I mentioned on the phone, the attached flyer is for illustrative purposes only and does not imply endorsement of the manufacturer.

The site parameters used to select a suitable culvert configuration were interpolated from aerial photography supplied by this office. Design parameters regarding fish passage were obtained from Mr. Paul Chappell, California Department of Fish and Game. The pertinent site and design parameters are as follows:

Culvert length: 100 feet (ft)
Culvert slope = terrain slope = 0.0018 ft/ft (.18%)
Maximum Q = Q_{100} = 300 cubic feet per second (cfs)
Range of fish passage = from 5 to 80 cfs
Maximum allowable velocity = 3.5 feet/second (ft/sec)
Minimum depth = 0.6 ft
Culvert configuration: Natural bottom

These parameters were met with only slight exceptions as follows:

- At 5 cfs the depth of flow equals 0.49 feet, which cannot be avoided with a natural, flat-bottom channel. If a low-flow channel were constructed, this problem would be eliminated.

- At 72 cfs the structure jumps from outlet to inlet control with a corresponding jump in velocity to 3.6 ft/sec. This is only slightly outside of the design parameters and would exist for only a brief moment in time.

I recommend that resting pools be constructed at the inlet and outlet of the structure to enhance fish passage. Keep in mind that the selected culvert represents only one alternative design, and that as long as design parameters are met, there may be other acceptable solutions to the south crossing. I hope that this information will help with your project. If you have any questions, I can be reached at 916-225-3144.

Sincerely,

ORIGINAL SIGNED BY
LAWRENCE T. MOORE

LARRY T. MOORE, P.E.
District Hydraulics Engineer
District 2

Attachment

LTM:lro
bcc: SChoate
LLane
ATrujillo
3-3692

TE OF CALIFORNIA - BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governor
EPARTMENT OF TRANSPORTATION
TRICT 2 Office of Encroachment Permits
. BOX 496073, REDDING, CA 96049-6073
(916) 225-3097
)NE (916) 225-3144

Ref. 02-Las-44-14.8
02-258280

November 10, 1997

Mr. David W. Sims
Agricultural Engineer
Natural Resources Conservation Service
United States Department of Agriculture
170 Russell Avenue, Suite I
Susanville, CA 96130

Dear Mr. Sims:

Pine Creek Hydrology

I have received the cross-section notes and profiles on the new Pine Creek channel alignment. Thank you for your prompt response on that matter. As we discussed, enclosed is a copy of my file on Pine Creek hydrology. The "Platt & Jensen" study is probably available from Steve Young at the Forest Service District office.

My preliminary calculation is for a double 5' span x 3' high reinforced box culvert at the northern crossing, and for a double 4' span x 6' high reinforced box culvert at the southern crossing. The southern crossing will be used for fish passage, and as such, the culvert will be set below grade to create a natural bottom. I will use the data you sent me along with our own survey data to verify that fish passage is sustainable for the range of flows under consideration (50-80 cfs).

David Lyle suggested a Pine Creek CRMP meeting later this month in Susanville. If the meeting were deferred to December, I would probably be able to attend with more definitive plans and schedules. I will be in touch with David on this matter as it may be possible to coordinate with the Value Analysis Study being done on Route 395 in Litchfield

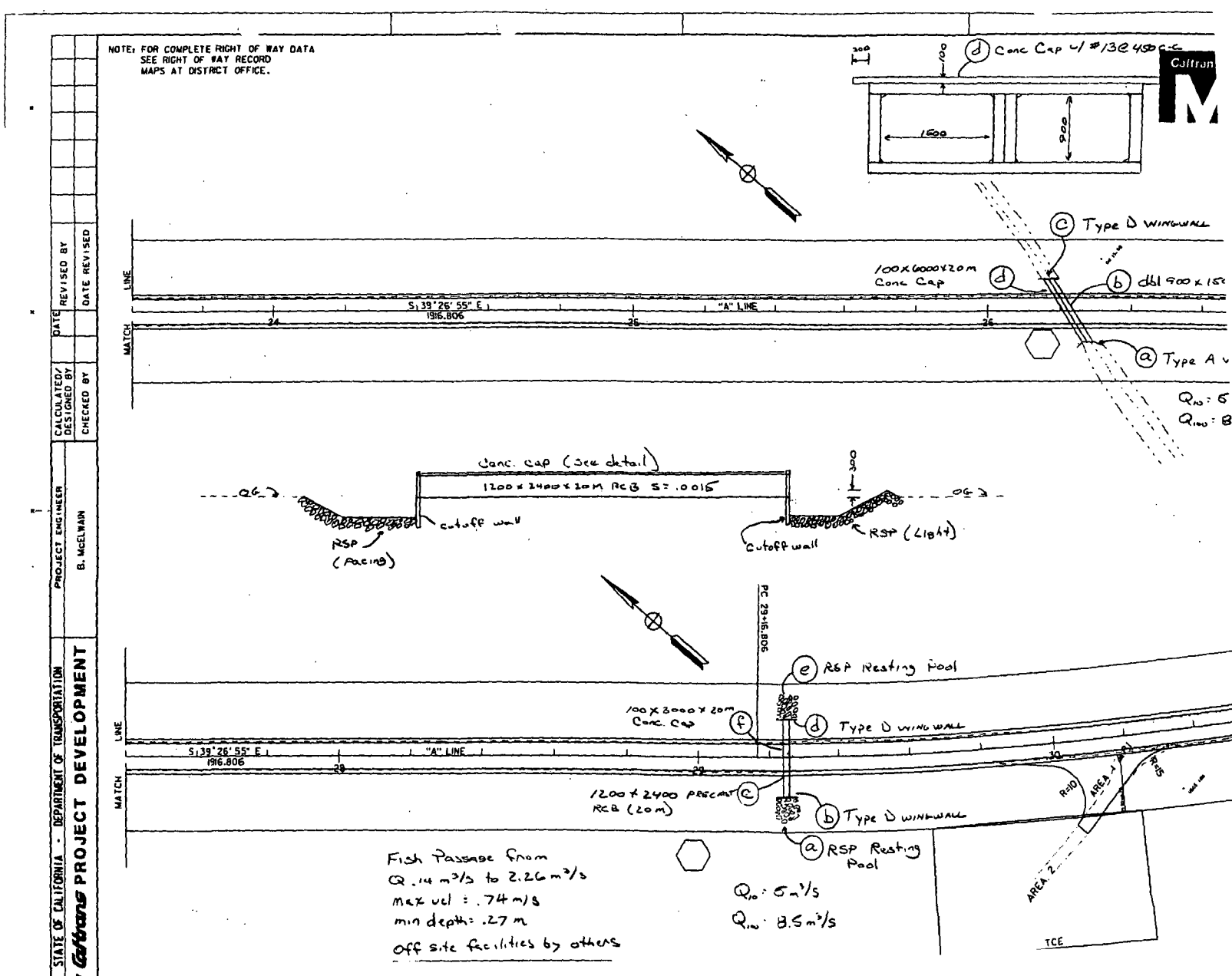
Again, thank you for your assistance.

Sincerely,

Lawrence T. Moore, P.E.
District Hydraulics Engineer
District 2

Enclosure

c: Steve Young
David Lyle


NOTE: FOR COMPLETE RIGHT OF WAY DATA SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
d Conc Cap w/ #13@450 c-c
1500
900
c Type D WINGWALL
100x6000x20m Conc Cap
d
b dbl 900 x 15
S 39° 26' 55" E 1916.806
"A" LINE
24
26
26
MATCH LINE
a Type A
Conc. cap (see detail)
1200 x 2400 x 20m RCB S=.0015
900
RSP (Facing)
cutoff wall
cutoff wall
RSP (Lining)
PC 29+16.806
e RSP Resting Pool
100 x 3000 x 20m Conc. Cap
f
d Type D WINGWALL
S 39° 26' 55" E 1916.806
"A" LINE
28
28
30
MATCH LINE
1200 x 2400 PRECAST RCB (20m)
c
b Type D WINGWALL
a RSP Resting Pool
RSP
AREA 1
AREA 2
TCE
Fish Passage from
Q .14 m³/s to 2.26 m³/s
max vel : .74 m/s
min depth: .27 m
off site facilities by others
Q_{10} = 5 m³/s
Q_{100} = 8.5 m³/s
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT
PROJECT ENGINEER
B. McELWAIN
CALCULATED/ DESIGNED BY
CHECKED BY
DATE
REVISED BY
DATE REVISED

facsimile
TRANSMITTAL

to: Virginia Lemke
fax #: 916/251-4898
re: Eagle Lake Trout
date: August 8, 1995
pages: 8, including cover sheet.

Attached please find the U. S. Fish and Wildlife Service's new release, and a copy of the federal register text regarding the Notice of 90-day petition finding, for the Eagle Lake Rainbow Trout.

From the desk of...

Donna G. Hummel
Information and Education Specialist
U. S. Fish and Wildlife Service
2800 Cottage Way, Room E - 1803
Sacramento, California 95825

(916) 979 - 2710
Fax: (916) 979 - 2723

NEWS RELEASE

U.S. FISH AND WILDLIFE SERVICE
REGION 1
911 N.E. 11th AVENUE
PORTLAND, OREGON 97232-4181

IDAHO - NEVADA - CALIFORNIA - WASHINGTON - OREGON - HAWAII AND THE PACIFIC ISLANDS

NC-G 95-56

Refer: David Klinger - 503/231-6121 (o.)
503/246-8346 (h.)

August 7, 1995

**ARE EAGLE LAKE RAINBOW TROUT IMPERILED?
FISH AND WILDLIFE SERVICE FINDS PETITION INSUFFICIENT, COMMENDS LOCAL WILLINGNESS TO PROMOTE RECOVERY WITHOUT LISTING**

Are rainbow trout in a high-montane lake in California's Lassen County threatened by degraded habitat and by competition with hatchery-reared fish? Not based on the information currently before it, the U.S. Fish and Wildlife Service says.

The Interior Department agency today found that a petition requesting listing of the Eagle Lake rainbow trout did not present substantial information to determine whether the subspecies should be proposed for Federal listing under the Federal Endangered Species Act. The petition was submitted by John F. Bosta of Susanville, California, requesting listing because there are no known self-sustaining populations of genetically-pure Eagle Lake rainbow trout outside of its native habitat in Lassen County.

But the Service found that the petition presented insufficient information regarding trout population numbers and trends and failed to provide data indicating substantial threats from existing management programs, like fish stocking. Further, the petition did not address how recovery efforts currently underway may have lessened any threats.

This subspecies evolved in the highly-alkaline waters of Eagle Lake -- habitat that ordinarily would be stressful or lethal for most other trout. Although similar in appearance to other trout, the Eagle Lake subspecies differs genetically and in other biological characteristics.

The Eagle Lake rainbow trout's decline is believed to have started in the late 1800's when commercial fishing began during spawning runs from the lake to area tributaries. Commercial fishing for trout was stopped in 1917. Trout populations remained low until artificial propagation and stocking was started, and

(over)

NEWS RELEASE

U.S. FISH AND WILDLIFE SERVIC
REGION 1
911 N.E. 11th AVENUE
PORTLAND, OREGON 97232-4181

IDAHO - NEVADA - CALIFORNIA - WASHINGTON - OREGON - HAWAII AND THE PACIFIC ISLANDS

NC-G 95-56

Refer: David Klinger - 503/231-6121 (o.)
503/246-8346 (h.)

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(over)

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 90-Day Finding for a Petition to List the Eagle Lake Rainbow Trout and Designate Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: The Fish and Wildlife Service (Service) announces the 90-day finding on a petition to list the Eagle Lake rainbow trout (Oncorhynchus mykiss aquilarum) under the Endangered Species Act (Act) of 1973, as amended. The Service finds that the petition did not present substantial information indicating that the petitioned actions may be warranted.

DATES: The finding announced in this document was made on July 25, 1995.

ADDRESSES: Information, data, comments, or questions concerning this finding should be submitted to the U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E-1803, Sacramento, California 95825-1846. The petition, petition finding, supporting data, and comments are available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Diane Windham, staff biologist, at the above

address or telephone 916-979-2725.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1533 et seq.) (Act), requires that the Service make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information to indicate that the petitioned action may be warranted. This finding is to be based on all information available to the Service at the time the finding is made. To the maximum extent practicable, this finding is to be made within 90 days of the date the petition was received, and the finding is to be published promptly in the Federal Register. If the finding is that substantial information was presented, the Service also is required to commence a review of the status of the species.

The Service has made a 90-day finding on a petition to list the Eagle Lake rainbow trout (Oncorhynchus mykiss aquilarum). The petition, dated April 25, 1994, was submitted by John F. Bosta, of Susanville,
California, and was received by the Service on April 28, 1994. The petition requested the Eagle Lake rainbow trout be listed as threatened or endangered, that critical habitat be designated, and that a recovery plan be developed. The petitioner provided some life history information for the Eagle Lake rainbow trout and material related to the fish passage problems, habitat degradation, and lack of natural reproduction. Recommendations for correcting habitat problems were included with the petition.

The Eagle Lake rainbow trout is a species of concern to the Service (November 15, 1994;

59 FR 58982). Such taxa are typically those for which some information indicates threats to the species exit but sufficient information on biological vulnerability and threats is not currently available indicating that listing as endangered or threatened is warranted.

Eagle Lake rainbow trout are endemic to Eagle Lake, Lassen County, California. Although they have been planted in numerous waters, no known self-sustaining populations of genetically pure Eagle Lake rainbow trout in waters exist outside of its native habitat. With the annual stocking of 200,000 Eagle Lake trout, the subspecies has been sustained almost entirely by California Department of Fish and Game's hatchery production since 1950. The petition and referenced literature describe the lack of natural reproduction as the most serious concern for the long-term survival of Eagle Lake rainbow trout. Due to passage barriers and habitat degradation in Pine Creek (the only major tributary for spawning), no significant natural reproduction of Eagle Lake rainbow trout has occurred for over 40 years. Though efforts by the Forest Service to improve fish passage and riparian habitat may not be completed for 5 years, these efforts to restore natural spawning in Pine Creek are now underway.

In making a finding as to whether a petition presents substantial commercial and scientific information to indicate the petitioned action may be warranted, the Service must consider whether the petition is accompanied by a detailed narrative justification [50 CFR § 424.14 (b)(2)(ii)]. The regulations require the Service to "consider whether such petition . . . [p]rovides information regarding the status of the species over all or a significant portion of its range" [50 CFR § 424.14 (b)(2)(iii)], including current distributional and threat information. Furthermore, the Service is required to "consider whether such petition . . . [i]s accompanied by appropriate supporting documentation in the form of bibliographic references, reprints of pertinent publications, copies of reports or letters from authorities, and maps" [50 CFR § 424.14 (b)(2)(iv)].

Despite the limited distribution of the Eagle Lake trout, the petition included insufficient information regarding present fish population numbers and trends. In addition, the petition failed to provide substantial threat data concerning projected and ongoing management considerations with respect to the existing popular sport fishery and the stocking program for the trout. The petition also did not address the extent to which threats have been lessened by the significant recovery efforts now underway. More importantly, the future status of the subspecies may improve because of the significant recovery efforts now underway and the ongoing stocking program. Therefore, the Service finds that the petition does not present substantial information indicating that the listing of the Eagle Lake rainbow trout may be warranted.

The Service has reviewed the petition, literature cited in the petition, and other literature and information available in the Service's files. On the basis of the best scientific and commercial information available, the Service finds the petition does not present substantial information indicating that the petitioned actions may be warranted. The Eagle Lake rainbow trout will remain a species of concern to the Service, and the Service will continue to seek information regarding the status or threats to the subspecies. If additional information becomes available in the future, the Service may reassess the listing priority for this subspecies or the need for listing.

The petitioner also requested that critical habitat be designated and a recovery plan be developed. If the Service decides in the future to propose the fish for listing, the Service will determine whether designation of critical habitat is prudent at the time a species is listed under the Act. Recovery planning efforts begin once a species is listed.

Author

The primary author of this document is Kevin Stubbs, Sacramento Field Office (see ADDRESSES section).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

ENDANGERED SPECIES ACT
PRELISTING PROJECT PROPOSAL

Submitted by

California Department of Fish and Game
March, 1995

1. **Species:** Eagle Lake trout (Oncorhynchus mykiss ssp.)

2. **Species Recovery Priority Number:** 2

3. **State:** California

4. **State Priority:** 2

5. **Recovery Plan Task Number:** N/A (A recovery plan is not presently written. This proposal, however, supports an action program of the PCCRMP.

6. **Task Priority Number (1-3):** 1

7. **Description of Project:** This project will (1) survey Pine Creek to provide information necessary for development of a chemical treatment plan for Pine Creek and related environmental documentation, (2) help fund the chemical treatment and (3) support management of the Eagle Lake trout (ELT) spawning run into Pine Creek during times when hatchery personnel are not operating the Pine Creek fish trap for egg taking purposes; the spawning run and barriers in other tributary streams would also be managed.

Pine Creek Surveys

Prior to chemically treating Pine Creek to remove exotic brook trout for the purpose of restoring spawning and rearing potential for ELT, all of the Pine Creek drainage, including its headwaters in Triangle Lake, needs to be surveyed and mapped for late summer flow plus fish and invertebrate species that might be affected by the proposed treatment. Spring and summer invertebrate surveys would emphasize native species that may be unique to the drainage as well as the more common species. The summer survey would include an adult collection to further verify species. The surveys are proposed for the 1995-96 fiscal year (FY) (pretreatment survey) and 1997-98 FY (posttreatment survey).

in recent years. There is no shortage of ELT since the spawning runs to the Pine Creek trap provide far more eggs than are needed for stocking Eagle Lake.

In 1994 the USFWS received petitions to list the ELT under the Federal Endangered Species Act (FESA) of 1973. The USFWS currently classifies the species as a candidate, Category 1 species. Concerns that support the candidate status of ELT relate primarily to the complete absence of natural spawning and total reliance on hatchery production. Under these conditions, the natural evolution of the ELT cannot continue.

Restoration of the natural evolution of the ELT depends on restoration of the spawning and rearing potential of Pine Creek, the goal of the PCCRMP. The PCCRMP has been constructing restoration projects that are attempting to restore the instream habitat, flows and remove barriers to trout migration. Barriers at the State Highway 44 crossing of Pine Creek should be eliminated by 1996 providing spawner access to the upper reaches of Pine Creek where permanent flows provide spawning and rearing potential. However, the potential for successful spawning and rearing is presently near zero because of a super dominant population of brook trout which have eliminated all ELT from the upper drainage. Chemical treatments are planned in 1996 to eliminate all brook trout so that ELT can be restored to this area and again can be recruited naturally to Eagle Lake.

Prior to any chemical treatment, surveys must be made to estimate and map flows in all stream reaches and tributaries, identify springs and document fish distribution. Invertebrate surveys will be required to determine what invertebrates are present, including any that may be unique or require special protection during the treatment. Those surveys and the chemical treatment of the drainage are a part of this multiyear project.

12. **Project Duration (All Past, Present and Planned Segments):** The Pine Creek surveys are proposed for the 1995-96 FY, the chemical treatments in 1996-97 FY and the spawning run management project in both 1995-96 and 1996-97 FY.

13. **Federal/State Cost Share:** State cost share will consist of in-kind contributions of equipment, personal services and overhead by Department personnel.

Written reports summarizing the survey results provided to the US Fish and Wildlife Service (USFWS) and other interested parties near the end of the fiscal years.

Pine Creek Chemical Treatment

Two chemical treatments of the Pine Creek drainage are proposed in 1997 with the second treatment made about two weeks following the first to ensure and document the completeness of the first.

If surveys reveal that there any species of special concern present in the drainage, a special treatment plan shall be implemented.

An example of a special treatment, if necessary, would provide for two separate treatments by dividing the creek into two segments at US Forest Service Road 31 NO8 where there is a 6-foot jump to act as a barrier to upstream fish migration. Prior to treatment a reasonable attempt shall be made to remove any species of special concern for post treatment reintroduction to the creek; these animals could be temporarily held in the lower section if necessary. The upper segment will be treated first and a potassium permangante decontamination station will be set up about half way down the perennial segment to ensure that no toxic chemical enters the lower segment of Pine Creek. The upper section will be retreated as previously described and, upon certification that the desired results have been achieved, the lower segment of Pine Creek will be treated in the same manner as the first segment. There would be no need for installation of any decontamination station in this terminal segment since during the late summer the lower end of Pine Creek is dry.

Spawning Run Management

During normal and better water years, Pine Creek flows into Eagle Lake for two to four months. During this period, Department of Fish and Game hatchery personnel operate the Pine Creek fish trap for about two to three weeks to spawn ELT that presently provide for virtually all of the lake's trout recruitment. However, temporary personnel are necessary to properly manage the run of ELT and other native nongame species during the times that hatchery personnel are not in attendance. This proposal would fund temporary help to manage the spawning run when hatchery personnel are not available. Emphasis would be on run monitoring, fish rescue and residence at the trap cabin to provide a Department presence to help prevent poaching and coordinate rescue efforts with permanent Department personnel and the public.

Other Eagle Lake tributaries including Papoose, Merrill, Little Merrill, Cleghorn and several unnamed tributaries also have temporary spring flows that attract spawners but which dry before many adults can return to the lake and before the eggs can hatch.

Barriers are installed or are being installed on many of these tributaries to keep the spawners close to the lake where they have the best chance of returning to the lake or being rescued. Temporary help for this spawning run management program would help maintain these barriers and rescue stranded spawners to minimize losses.

8. **Project Number if Continuing Segment of Existing Project:** N/A.

9. **Status of Progress Report Prepared for Previous Project:** N/A.

10. **Project to be Completed by the Applicant State Agency or Under a Contract to an Outside Entity:** Project work will be conducted by Department personnel and a project subcontract with Regents of the University of California for the invertebrate studies.

11. **Biological or Recovery Justification:** The native Eagle Lake rainbow trout is the only trout known to survive in the highly alkaline water of Eagle Lake. The ELT was believed extinct when the California Department of Fish and Game became aware that a few of the original stock were still to be found in the spring of the year in Pine Creek, the principal tributary stream of the lake. From these few remaining specimens, an artificial propagation program was undertaken by the Department. In 1958 approximately 5,000 six- to eight-inch trout were stocked in the lake. Since then, the Department has gradually increased the size of the plant so that now about 200,000 are planted each year.

Since the fall of 1960 a sport fishery for the ELT has developed, now providing quality fishing for large trout. Planted trout weigh about one-half pound each when planted in the spring or fall months. They typically grow to about two pounds after one year in the lake and to over three pounds after two years in the lake. Six-pound ELT are not uncommon and trout to nearly 12 pounds are caught occasionally. The exceptional size of trout in the catch is due to their rapid growth rate and angling regulations which limit their harvest. ELT feed extensively on small invertebrates and on the native minnows, primarily tui chubs.

The rehabilitation of the ELT has been tremendously successful. From a handful of spawners in 1956, the spawning runs have increased to thousands of spawning fish

Job 1. Survey Pine Creek (about 13 miles of stream, numerous potholes, seeps and springs and five lakes).

	1995/96 FY	1996/97 FY	1997/98 FY
Temporary help, (includes data summary and report writing assistance)	$10,500		$ 1,654
General expense	600		100
Vehicle operation (2 vehicles 75 miles/day, 50 days, $.25/mile)	1,875		375
Invertebrate surveys and report	$ 7,600		$ 5,880
Subtotal	$20,575		$ 8,009
Administrative overhead at 22.5%	$ 4,629		$ 1,802
Total Federal share	$25,204		$ 9,811
Total State share	$ 8,401		$ 3,270
Total	$33,605		$13,081

Job 2. Chemical Treatment

Temporary help (2 months)		$ 3,150	
General expense travel (for permanent and temporary employees)		$ 7,000	
Equipment rental, fuel		$ 5,000	
Rotenone (418 gallons at $55/gallon)		$22,990	
Subtotal		$38,140	
Administrative overhead at 22.5%		$ 8,582	
Total Federal Share		$46,722	
Total State Share		$15,574	
Total		$62,296	

Job 3. Spawning Run Management

Temporary help (3 months)	$ 4,500	$ 4,725	$ 4,961
General expense	$ 300	$ 315	$ 331
Vehicle operation (40 miles/day 20 days/month, 3 months at $.25/mile in 1995-96 FY and $.26/mile in 1996-97 FY)	$ 600	$ 624	$ 655
Subtotal	$ 5,400	$ 5,664	$ 5,947
Administrative overhead at 22.5%	$ 1,215	$ 1,274	$ 1,338
Total Federal Share	$ 6,615	$ 6,938	$ 7,285
Total State Share	$ 2,205	$ 2,313	$ 2,428
Total	$ 8,820	$ 9,251	$ 9,713

	1995/96 FY	1996/97 FY	1997/98 FY
Grand Total (Jobs 1, 2 and 3)			
Total Federal Share	$31,819	$53,660	$17,096
Total State Share	$10,606	$17,887	$ 5,698
Total	$42,425	$71,547	$22,794

14. **Other Information:** this proposed project has been developed in coordination with the PCCRMP which involves representation from the public, Lassen County, Department of Fish and Game, US Forest Service, USFWS, grazing interests and sportsmen.

DW/mrw:IFD1 WINHAMPP.ESA

Water Quality Samples for California

USGS 10356500 SUSAN R A SUSANVILLE CA

Available data for this site

Lassen County, California
Hydrologic Unit Code 18080003
Latitude 40°25'03", Longitude 120°40'15" NAD27
Drainage area 184.00 square miles

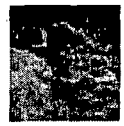
Output formats

- Parameter Group data summary
- Inventory of available water-quality data
- Inventory of water-quality data with retrieval
- Tab-separated ASCII file, serial order
- Tab-separated ASCII file, wide order
- Reselect output format

SAMPLE DATETIME	MEDIUM CODE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
1978-05-16 09:00	9	≤ 100.	nd .0	nd .0	≤ 2.	≤ 2.	
1978-08-15 10:00	9	≤ 100.	≤ 2.	nd .0	≤ 2.		
1978-11-22 09:30	9	20.	4.	≤ 3.	2.	7.	
1979-02-14 09:30	9	≤ 100.	2.	nd .0	≤ 2.	10.	
1979-05-18 07:30	9	≤ 100.	≤ 2.	2.	nd .0	13.	
1979-08-17 11:30	9	40.	≤ 2.	≤ 3.	2.	10.	
1979-11-20 09:45	9	30.	2.	≤ 3.	.0	1.	
1980-03-11 11:10	9	30.	≤ 1.	≤ 3.	2.	2.	
1980-05-14 08:30	9	20.	≤ 1.	≤ 3.	2.	1.	
1980-08-13 09:30	9	20.	≤ 1.	≤ 3.	2.	14.	
1980-11-20 09:40	9	30.	≤ 1.	≤ 3.	2.	4.	
1981-01-20 08:45	9	30.	≤ 1.	≤ 3.	2.	4.	

		Ba	Cd	Co	Cu	Pb	Sr
1981-05-20 08:30	9	20.	≤ 1.	≤ 3.	2.	6.	
1981-09-23 09:00	9	36.	≤ 1.	.0	1.	5.	
1981-11-24 09:00	9	17.	≤ 1.	≤ 3.	6.	12.	
1982-01-18 15:30	9	17.	≤ 1.	≤ 3.	≤ 1.	≤ 1.	
1982-05-11 16:30	9	19.	≤ 3.	≤ 1.	3.	3.	
1982-09-21 15:45	9	26.	≤ 1.	1.	2.	≤ 1.	
1982-11-16 14:00	9	25.	≤ 1.	≤ 3.	≤ 1.	2.	110.
1983-01-13 14:15	9	33.	≤ 1.	≤ 3.	2.	≤ 1.	110.
1983-05-10 11:45	9	24.	≤ 1.	≤ 3.	19.	2.	54.
1983-09-27 15:00	9	34.	≤ 1.	≤ 3.	5.	1.	110.
1983-11-15 10:15	9	29.	1.	≤ 3.	2.	≤ 1.	110.
1984-01-24 10:45	9	27.	≤ 1.	≤ 3.	2.	1.	97.
1984-05-22 10:00	9	16.	≤ 1.	≤ 3.	≤ 1.	≤ 1.	62.
1984-09-17 13:45	9	30.	≤ 1.	≤ 3.	11.	2.	120.
1984-11-19 14:30	9	28.	≤ 1.	≤ 3.	3.	≤ 1.	110.
1985-01-22 12:00	9	25.	≤ 1.	≤ 3.	≤ 1.	2.	120.
1985-05-22 12:00	9	26.	≤ 1.	≤ 3.	2.	≤ 1.	76.
1985-09-25 10:30	9	33.	≤ 1.	≤ 3.	2.	1.	120.
1985-11-20 13:50	9	29.	≤ 1.	≤ 3.	1.	≤ 5.	120.
1986-01-23 12:00	9	18.	≤ 1.	≤ 3.	2.	5.	88.
1986-05-20 14:40	9	13.	≤ 1.	≤ 3.	1.	≤ 5.	69.
1986-11-19 12:00	9	19.	≤ 1.	≤ 3.	1.	≤ 5.	120.
1987-01-21 13:25	9	19.	≤ 1.	≤ 3.	1.	≤ 5.	120.
1987-05-20 10:00	9	9.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	39.
1987-09-16 10:45	9	25.	≤ 1.	≤ 3.	2.	≤ 5.	140.
1987-11-18 12:15	9	19.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	120.
1988-01-27 11:30	9	17.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	120.
1988-05-18 11:15	9	18.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	110.
1988-09-14 13:15	9	25.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	140.
1988-11-22 11:25	9	20.	≤ 1.	≤ 3.	2.	≤ 5.	120.
1989-01-25 11:15	9	21.	≤ 1.	≤ 3.	≤ 1.	≤ 5.	120.
1989-05-23 12:00	9	11.	≤ 1.	≤ 3.	2.	≤ 1.	50.
1989-09-19 11:30	9	22.	≤ 1.	≤ 3.	1.	≤ 1.	130.

DEPARTMENT OF WATER RESOURCES
Division of Planning and Local Assistance
NORTHERN DISTRICT



Water Quality
- Lakes and Reservoirs -
- Honey Lake -

Honey Lake Water Quality Investigation

Summary

The ground water is generally sodium bicarbonate in character. Because there is no drainage, salts have accumulated in the basin. In local areas, high concentrations of chlorides are encountered and in the northern part of T28N/R14E one well contains water definitely sodium chloride in character.

The arsenic encountered in certain wells in the valley is probably the result of underground mineralized water migrating into the ground water body. The arsenic content in the water from Wendel and Amedee Hot Springs and the fact that the majority of wells which contained arsenic in their waters are located along the traces of concealed faults indicates that the arsenic is of magmatic origin. With the exception of those wells in the vicinity of Standish, hydrostatic pressure and dilution of the initial source prevent the arsenic levels from exceeding 0.05 ppm.

Those wells near Standish whose waters have arsenic concentrations ranging up to 2.0 ppm are probably also fed by underground magmatic sources; however, the sources are probably relatively near the surface. Depth to bedrock is probably less and the amount of dilution by the meteoric ground water is less than in the deeper parts of the basin. Any underground source would probably have a higher concentration of arsenic than either Wendel or Amedee Hot Springs where meteoric waters are mixed, heated and discharged

A copy of this report may also be obtained by contacting Jerry Boles by phone at: (530) 529-7326 or by e-mail at: bolesj@water.ca.gov

[Back | Home]

For more information contact Jerry Boles

Webmaster: Larry Shuman
The URL is http://wwwdpla.water.ca.gov/nd/
Last modified: May 22, 1998.

Comments or Suggestions?

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, *Governor*

DEPARTMENT OF FISH AND GAME
601 LOCUST STREET
REDDING, CA 96001
(916) 225-2300

March 30, 1995

Ms. Joyce Coakley
Rangeland Management Specialist
Lassen National Forest
Eagle Lake Ranger District
55 Sacramento Street
Susanville, California 96130

Dear Ms. Coakley:

The Department of Fish and Game, Northern California - North Coast Region (Region 1) has reviewed the Pine Creek Riparian and Fish Passage Improvement Project Draft Environmental Assessment (EA). This EA is the second publicly circulated draft. The Department made extensive comments on the first draft on August 26, 1994. We appreciate the US Forest Service (USFS) modifying the EA to reflect some of our comments, however, there are still several significant areas of concern which the Lassen National Forest (LNF) has neglected to address in the EA. The Department has the following general comments.

Pine Creek provides 75 to 85 percent of the total inflow to Eagle Lake. Eagle Lake is the second largest natural lake within the State of California. There is a long history of concern over accelerated eutrophication processes that are occurring in Eagle Lake's closed basin and several governmental agencies have become involved in this issue. The Lahontan Regional Water Quality Control Board (LRWQCB) has amended their basin plan for Eagle Lake basin to prevent discharge of nutrients to the lake from point sources. Additionally, the basin plan addresses control of nonpoint nutrient sources through the use of best management practices that apply to watershed management, including the management of livestock grazing. Historically, water quality degradation and habitat loss nearly resulted in the extinction of a unique subspecies of rainbow trout, the Eagle Lake trout. Early restoration efforts to artificially sustain the fishery have been successful and presently the lake attracts large numbers of recreational and sport fishery users. Presently the economic benefits from maintaining a clean lake and a robust fishery are estimated to exceed 10 million dollars.

The LNF administers approximately 90 percent of the property in the Pine Creek watershed. As a Federal agency, the LNF must comply with the Federal Clean Water Act (FCWA) and the North Lahontan Basin Water Quality Control Plan. This plan states that controllable factors shall not cause any 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. The Department believes that the basin plan objectives could be met through implementation of the "Proposed Action", the "Corridor Alternative", the "Platts Alternative" or by elimination of grazing which impacts Pine Creek.

As stated in our previous comment letter the Department believes that this document will not be acceptable to the State Water Resources Control Board (Board) as a final report pursuant to the requirements of the Environmental Protection Agency (EPA) Clean Lakes Grant. The EPA granted $95,590 to study Pine Creek impacts on Eagle Lake. The LNF was to receive $50,590 to perform certain tasks and generate documents with the EA serving as the final report. The LNF has already received $38,247 from the EPA through the Board and the Department. Ms. Janet Blake is the grant project manager at the Board and her EA comment letter dated August 9, 1994, described in detail what additions were necessary to comply with the requirements of the Clean Lakes Grant. Unfortunately the current EA did not respond to the majority of her comments.

The Department, in a June 7, 1994, letter to Ms. Joyce Coakley, also discussed the terms of Collection Agreement 313135 of June 22, 1992, and components listed as tasks in the EPA grant which must be included in the final report. Our concern is that the terms and conditions of the interagency agreement will not be fulfilled and the Department will be held accountable to the Board for the report which was to be prepared by the LNF. The Department is concerned that failure of the LNF to correct the document as requested by the Board will cause denial of future EPA and Board funding opportunities. Several LNF proposed restoration projects list EPA as a funding source, yet LNF has failed to meet the conditions of the existing grant. Past grant compliance and performance are major factors in selecting recipients of EPA grants. The completion date for the final report was December 31, 1993. It is now March 1995 and the report does not yet meet the requirements of the EPA grant.

We appreciate that the document now includes an appendix with portions of the "Lassen National Forest Standards and Guidelines." We are still confused with on-the-ground interpretations of these standards and guidelines. We believe that "standards" should be clearly noted mandatory as opposed to "guidelines" which provide preferred direction. The land resource management plan must clearly define each as a standard or guideline before we can evaluate their adequacy in protecting

resources. The EA frequently alludes to "Riparian Objectives", however, nowhere in the EA are they actually defined. Are "riparian objectives" the same as "Desired future conditions"? These objectives must be clearly defined so that we are able to understand the proposed action the LNF intends to take.

The EA describes a "Proposed Action" which appears to be Alternative IV - Lassen National Forest Land and Resource Management Plan (LRMP) although this is not clearly stated in the EA.

Specific comments:

Page 2, paragraph 3: The paragraph discusses several sources of information regarding Pine Creek. It would help the reviewer to know at this point that the full citations are available in Reference Appendix G.

Page 5, Key indicators: 2. B. "Changes in width:depth ratio of the stream (less than 10 for B channel types and less than 5 for C channel types)." A definition of "B and C" channel types would assist the reviewer unfamiliar with these terms. It is also unclear if the change is to be less than 10 or the final ratio is less then 10.

Page 5, Significant Issues: 3. "How will the alternatives affect the riparian vegetation? Key indicators A. Percentage of vegetative and litter cover on soils along the riparian areas of Pine Creek (90 percent cover of non-rocky riparian areas)." None of the alternatives list a monitoring plan for "percent cover". This section should describe how this key indicator will be monitored.

Monitoring methods for fixed photo plots, stubble height utilization, cover and raw/eroding banks were covered fairly well in the first draft appendix. The new Appendix C contains even more detail on those monitoring methods. In our comment letter on the first draft we requested that the appendix include monitoring methods referenced for stream temperatures and nutrient and limnological data collected at Eagle Lake. Appendix C still lacks methods for monitoring stream temperatures. We are especially concerned that the previously proposed nutrient and limnological monitoring of Eagle Lake has been excluded from the EA entirely! We recommend that it be included since the Department of Water Resources (DWR) and LNF Eagle Lake nutrient monitoring program was a part of the EPA grant tasks and an important component in the overall understanding of watershed conditions. Future lake monitoring may be a key indicator for determining the success or failure of the proposed changes in

management of the watershed. A brief paragraph on the past monitoring results and how the information fits in with the proposed alternatives was requested several times by the Department and the Board. This information is essential to meet grant specifications and inform the reviewer.

The table on Page 13, "Pine Creek Riparian Grazing Management By Reach" is informative and accurately describes the actual conditions of Pine Creek.

The tables on pages 15-18, labeled "Pine Creek Restoration Projects", include the explanation that some projects have been completed and, therefore, satisfy our earlier comment. However, Project 13, "McKenzie Cow Camp, splitter removal" is only half complete. The splitter has been removed but the component to: "plug the man-made ditch and allow the creek to flow in natural channels" has not yet been accomplished. We recommend this project be described separately.

The description for Project 21 is different in the table from the project described in Appendix B. The table lists a "Riparian Pasture", which is described as a grazing management technique in Appendix A. Project 21 in Appendix B discusses "Livestock Control...by either fencing or distribution." Are the two descriptions the same grazing strategies?

Project 24 calls for fencing and developing a riparian pasture by constructing three miles of fence. This project is only considered in Alternative 1. Most of the other alternatives call for exclosure of that portion of Pine Creek. The EA should describe how this exclosure will be accomplished.

Section IV - Affected Environment. This section is an improvement over the previous draft. Including desired conditions along with stream reaches makes conditions in the watershed more understandable.

Page 24, Pine Creek Nutrient Loading to Eagle Lake. The first paragraph, last sentence, states "There appears to be no flushing or surge of livestock originated nutrients from the watershed during initial spring runoff flows." The section then goes on to describe water quality sampling studies done in the past by the LNF and the Department. **The revised draft did not address any of the comments from our previous letter.**

Appendix D in the revised draft shows the sample locations from the two water quality studies in Figure 1. **These sampling stations have been reversed** in this draft EA. Pine Creek Station 1 (PC-1) is at the mouth of the creek. Your map shows this

station as "Pine Creek Temperature Station 4". PC-4 is the station above Highway 44. Perhaps this is why the EA makes the erroneous statement that "some of the highest total nitrogen and phosphorous concentrations were observed early in the runoff season at the station above Highway 44, where cattle grazing had a minor impact on the channel and where the riparian vegetation is least affected." This rationale is rather doubtful, however, since the first draft of the EA had the map showing the correct station names and locations. There will be nine sampling stations for next year's temperature studies. Details are available from Department Associate Fisheries Biologist Mr. Paul Chappell at phone number (916) 254-6363. Describing the stations as "Temperature Stations" is misleading since nutrients, suspended solids, settleable matter, temperatures and pH were all collected at the four Pine Creek stations during 1993. We recommend that the stations be described as water quality monitoring stations.

Since Table 1 in Appendix D was not revised as requested in our August 26, 1994, comment letter, we still do not understand how the LNF calculated nutrient loads. To properly evaluate and critique the table, it is essential that raw data be available from both water quality sampling studies. It is also necessary to have the specific methods used for calculating the nutrient loads. We are unsure if total Kjeldahl nitrogen loading was included in the amounts shown in Table 1. The table lists: "Estimated total nitrogen (nitrate and nitrite) loading of Eagle Lake". It says nothing about Kjeldahl nitrogen loading.

Kjeldahl nitrogen loading may have significant impacts on the nutrient balance in Eagle Lake. Our Department sampling shows Station PC-1 at the mouth of Pine Creek with a **total Kjeldahl nitrogen measurement of 0.98 mg/l on June 11, 1993.** This data contradicts the statement on page 24, #2. "Some of the highest total nitrogen and phosphorous concentrations were observed early in the runoff season at the station above Highway 44, where cattle grazing had a minor impact on the channel and where the riparian vegetation is least affected. The highest concentrations measured during the two years' sampling were 1.49 mg/l total nitrogen and 0.59 mg/l total phosphorous, but most results were less than 0.10 mg/l for both nutrients--particularly later in the runoff season."

Water quality studies conducted by the Department in 1993 show, **with the exception of one sample out of eleven, higher levels of total phosphorus at PC-1 (the fish trap at the confluence of Pine Creek with Eagle Lake)** than at PC-4 (above Highway 44 at the Bogard Campground). Total Kjeldahl nitrogen and nitrate plus nitrite concentrations were also higher at PC-1

on several sampling dates (e.g., on April 2, 1993, PC-1 and PC-2 had levels of 0.32 mg/l nitrate plus nitrite compared to PC-4 results of less than 0.01 mg/l). Kjeldahl nitrogen was also measured on July 7, 1993, as 0.63 mg/l at PC-2 and 0.71 mg/l at PC-3. If the total Kjeldahl nitrogen was not included in the loadings in this appendix, there may be significant additional loading of total nitrogen to Eagle Lake. This data contradicts the statement on page 24, #3, "Pine Creek's chemistry exhibits a spring flushing of nutrients at all stations, but that effect is most notable at the upstream station (pc-4)." We recommend that the EA be revised to reflect the actual data.

The EA states on page 25, #4, that "The amount of nutrients entering the lake on clay and silt sized sediment particles was not measured, and any subsequent, additional nutrient loading to the lake from dissolution off of deposited sediments has not been evaluated." The Department's 1993 water quality study sampled and analyzed these sediment particles. We collected unfiltered samples and analyzed them for total phosphorus, total Kjeldahl nitrogen, total ammonia and nitrate. All this information was provided to the LNF prior to completion of the first draft EA and again during the first comment period. These loadings are in violation of basin plan objectives for Eagle Lake and Pine Creek. We recommend that the EA show how these data were used by the LNF in determining the proposed action for management of the Pine Creek drainage into Eagle Lake.

Section V - Environmental Consequences, Page 32. It is not clear how the environmental benefit ratings of grazing strategies and improvement projects were determined. We recommend that the EA be revised to show how the ratings were made. If the ratings were based on professional judgment, who made the judgments and what criteria were used? A brief explanation should be included.

Section V - Environmental Consequences, Page 33, #1, Significant Issues, A, Key Indicators, Alternative II: The Department wishes to emphasize the original caveat made regarding this proposed two-foot-high main channel structure. If under any circumstances it is found that this structure may impede or prevent the free passage of fish in Pine Creek, it shall be found to be in violation of California Fish and Game Code Section 5931 and shall be immediately removed.

Page 34, C. Changes in Stream Temperature. Alternative II. In this draft there is no discussion of the potential impacts from proposed Project 15. There can be no doubt that this proposed project has the potential to adversely raise water

temperatures. If this project is implemented, additional monitoring by the Department will be required. If adverse conditions are documented, the project will need to be removed.

Pages 38-40, 4. "How will the alternatives affect other wildlife habitat?" In the discussion of Alternative II, on page 39, the EA states, "For the areas that receive similar grazing management prescriptions as listed in Alternative I, the recovery rate of the riparian zone would be similar, particularly since the Lassen LRMP guidelines will be followed" On page 40, for Alternatives IV and V the document states, "For the areas that receive similar grazing management prescriptions as listed in Alternatives I or II, the recovery rate of the riparian zone will be similar, particularly if Lassen LRMP guidelines are followed." It is not clear if these alternatives would follow the LNF LRMP guidelines. This is precisely the reason why the Department is concerned about the definition and implementation of the standards and guidelines and their meaning to on-the-ground management.

Cumulative Effects, page 41. This section appears to be a somewhat obtuse definition of the meaning of cumulative effects. It does not discuss the results of the report, "Cumulative Watershed Effects Estimate for Pine Creek Watershed, Lassen County, California", LNF, January 25, 1993. It would be more informative to the reader to include a discussion of this study which was done for the EPA grant or at least list it in the reference appendix.

Adverse Effects That Cannot Be Avoided, page 41. This section should be significantly revised. It states, "There will be no foreseeable adverse environmental effects." What element(s) of the project is this statement referring to? The EA, all the alternatives, grazing on Pine Creek? The section also addresses additional labor for fence maintenance or increased labor for moving livestock off riparian areas. This section is very confusing and the Department recommends that it be revised.

Incomplete Or Unavailable Information, page 41. The first paragraph of the section states, "The ID Team estimated the effects of the alternatives by using existing data and established relationships. There is a substantial amount of credible information about the topics of this analysis." We recommend that this section be rewritten taking into consideration the available nutrient information. The revised section should discuss how the information was used to select the proposed action.

The "Pine Creek Reach Locations" map appears to be missing part of the key. However, we appreciate the incorporation of our previous comments.

Appendix B, Project #1, (no page #): The riparian pasture in the first draft of the EA was "recommended for occasional use in order to meet vegetative objectives established by the Forest Service, and the permittee and complying with the Forest Standards and Guidelines. The pasture is currently in its third year of nonuse." However, in the last two years, during random field trips to this site, trespass cattle have been found grazing. We notice that the second draft EA changed the project description to simply, "Riparian pasture: This project was completed to control livestock grazing on Pine Creek in Reach 5 west of Highway 44." Was range evaluation done to determine the level of use during this trespass period? If so, what action was taken by the LNF to ascertain whether the vegetation objectives were met during those two years? Were streambank conditions evaluated relative to trampling damage that occurred during the wet season of use by trespass cattle? Have the vegetation goals expected by the LNF for riparian pasture prescription been met despite the illegal use of this pasture? The EA should be revised to provide answers to these questions.

Project 6 (no page #) is listed as completed in the project table but as "in progress" in the appendix. The correct status should be listed in both text locations.

Project 26, (no page #) Fish Barrier Removal. Component A. "Remove existing culvert which is a fish barrier". We suggested removing this barrier and allowing the creek to return to its natural stream grade in our previous comment letter. Impacts from traffic can only be avoided, however, if the 1/2 mile segment of USFS Road 31N08 closure is also part of the project. The road could still be available for emergency use by placing gates at both ends and constructing a ramped wet crossing of Pine Creek. Closure of this road should not have any significant impact on public transit through this general area as there are numerous other roads crossing Pine Creek within very reasonable distances.

Component C. "Replace existing culverts to provide for fish passage". In any decision made regarding fish passage on Pine Creek, the impact of culverts cannot be taken lightly. We now recognize that there are specific conditions of flow and temperature that must be simultaneously met to successfully pass fish to the headwaters of the system. It is of the utmost

importance that these culverts be made passable under any flow condition that may be encountered by migrating fish. There should also be a natural bottom on these culverts.

Thank you for the opportunity to comment on this document. We appreciate the significant changes between this draft and the previous draft EA. There are still significant problems with this document meeting the specifications of the EPA grant and with certain interpretations of the Pine Creek sample results. We believe, however, that the proposed alternative is clearly superior to the one chosen in the first draft. We also believe that the proposed alternative will help meet the water quality objectives in the basin plan. If we may be of any further assistance or if you have any questions or comments regarding our position, please contact staff biologist Ms. Jane Vorpagel at (916) 225-2124.

Sincerely,

Donald Koch

Richard L. Elliott
Regional Manager

cc: See attached list

cc: Mr. Fred Blatt ✓
Lahontan Regional Water Quality Control Board
2092 Lake Tahoe Boulevard
South Lake Tahoe, California 96150

Ms. Janet Blake
State Water Resources Control Board
Post Office Box 100
Sacramento, California 95812-0100

Ms. Kristianna Young
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Ms. Jane Vorpagel
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601 Locust Street
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Mr. Daniel McGin
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Lincoln, California 95648

Mr. Paul Chappell
Department of Fish and Game
728-600 Fish and Game Road
Wendel, California 96136

ENDANGERED SPECIES ACT
PRELISTING PROJECT PROPOSAL

Submitted by

California Department of Fish and Game
March, 1995

1. **Species:** Eagle Lake trout (Oncorhynchus mykiss ssp.)

2. **Species Recovery Priority Number:** 2

3. **State:** California

4. **State Priority:** 2

5. **Recovery Plan Task Number:** N/A (A recovery plan is not presently written. This proposal, however, supports an action program of the PCCRMP.

6. **Task Priority Number (1-3):** 1

7. **Description of Project:** This project will (1) survey Pine Creek to provide information necessary for development of a chemical treatment plan for Pine Creek and related environmental documentation, (2) help fund the chemical treatment and (3) support management of the Eagle Lake trout (ELT) spawning run into Pine Creek during times when hatchery personnel are not operating the Pine Creek fish trap for egg taking purposes; the spawning run and barriers in other tributary streams would also be managed.

Pine Creek Surveys

Prior to chemically treating Pine Creek to remove exotic brook trout for the purpose of restoring spawning and rearing potential for ELT, all of the Pine Creek drainage, including its headwaters in Triangle Lake, needs to be surveyed and mapped for late summer flow plus fish and invertebrate species that might be affected by the proposed treatment. Spring and summer invertebrate surveys would emphasize native species that may be unique to the drainage as well as the more common species. The summer survey would include an adult collection to further verify species. The surveys are proposed for the 1995-96 fiscal year (FY) (pretreatment survey) and 1997-98 FY (posttreatment survey).

in recent years. There is no shortage of ELT since the spawning runs to the Pine Creek trap provide far more eggs than are needed for stocking Eagle Lake.

In 1994 the USFWS received petitions to list the ELT under the Federal Endangered Species Act (FESA) of 1973. The USFWS currently classifies the species as a candidate, Category 1 species. Concerns that support the candidate status of ELT relate primarily to the complete absence of natural spawning and total reliance on hatchery production. Under these conditions, the natural evolution of the ELT cannot continue.

Restoration of the natural evolution of the ELT depends on restoration of the spawning and rearing potential of Pine Creek, the goal of the PCCRMP. The PCCRMP has been constructing restoration projects that are attempting to restore the instream habitat, flows and remove barriers to trout migration. Barriers at the State Highway 44 crossing of Pine Creek should be eliminated by 1996 providing spawner access to the upper reaches of Pine Creek where permanent flows provide spawning and rearing potential. However, the potential for successful spawning and rearing is presently near zero because of a super dominant population of brook trout which have eliminated all ELT from the upper drainage. Chemical treatments are planned in 1996 to eliminate all brook trout so that ELT can be restored to this area and again can be recruited naturally to Eagle Lake.

Prior to any chemical treatment, surveys must be made to estimate and map flows in all stream reaches and tributaries, identify springs and document fish distribution. Invertebrate surveys will be required to determine what invertebrates are present, including any that may be unique or require special protection during the treatment. Those surveys and the chemical treatment of the drainage are a part of this multiyear project.

12. **Project Duration (All Past, Present and Planned Segments):** The Pine Creek surveys are proposed for the 1995-96 FY, the chemical treatments in 1996-97 FY and the spawning run management project in both 1995-96 and 1996-97 FY.

13. **Federal/State Cost Share:** State cost share will consist of in-kind contributions of equipment, personal services and overhead by Department personnel.

Written reports summarizing the survey results provided to the US Fish and Wildlife Service (USFWS) and other interested parties near the end of the fiscal years.

Pine Creek Chemical Treatment

Two chemical treatments of the Pine Creek drainage are proposed in 1997 with the second treatment made about two weeks following the first to ensure and document the completeness of the first.

If surveys reveal that there any species of special concern present in the drainage, a special treatment plan shall be implemented.

An example of a special treatment, if necessary, would provide for two separate treatments by dividing the creek into two segments at US Forest Service Road 31 NO8 where there is a 6-foot jump to act as a barrier to upstream fish migration. Prior to treatment a reasonable attempt shall be made to remove any species of special concern for post treatment reintroduction to the creek; these animals could be temporarily held in the lower section if necessary. The upper segment will be treated first and a potassium permangante decontamination station will be set up about half way down the perennial segment to ensure that no toxic chemical enters the lower segment of Pine Creek. The upper section will be retreated as previously described and, upon certification that the desired results have been achieved, the lower segment of Pine Creek will be treated in the same manner as the first segment. There would be no need for installation of any decontamination station in this terminal segment since during the late summer the lower end of Pine Creek is dry.

Spawning Run Management

During normal and better water years, Pine Creek flows into Eagle Lake for two to four months. During this period, Department of Fish and Game hatchery personnel operate the Pine Creek fish trap for about two to three weeks to spawn ELT that presently provide for virtually all of the lake's trout recruitment. However, temporary personnel are necessary to properly manage the run of ELT and other native nongame species during the times that hatchery personnel are not in attendance. This proposal would fund temporary help to manage the spawning run when hatchery personnel are not available. Emphasis would be on run monitoring, fish rescue and residence at the trap cabin to provide a Department presence to help prevent poaching and coordinate rescue efforts with permanent Department personnel and the public.

Other Eagle Lake tributaries including Papoose, Merrill, Little Merrill, Cleghorn and several unnamed tributaries also have temporary spring flows that attract spawners but which dry before many adults can return to the lake and before the eggs can hatch.

Barriers are installed or are being installed on many of these tributaries to keep the spawners close to the lake where they have the best chance of returning to the lake or being rescued. Temporary help for this spawning run management program would help maintain these barriers and rescue stranded spawners to minimize losses.

8. **Project Number if Continuing Segment of Existing Project:** N/A.

9. **Status of Progress Report Prepared for Previous Project:** N/A.

10. **Project to be Completed by the Applicant State Agency or Under a Contract to an Outside Entity:** Project work will be conducted by Department personnel and a project subcontract with Regents of the University of California for the invertebrate studies.

11. **Biological or Recovery Justification:** The native Eagle Lake rainbow trout is the only trout known to survive in the highly alkaline water of Eagle Lake. The ELT was believed extinct when the California Department of Fish and Game became aware that a few of the original stock were still to be found in the spring of the year in Pine Creek, the principal tributary stream of the lake. From these few remaining specimens, an artificial propagation program was undertaken by the Department. In 1958 approximately 5,000 six- to eight-inch trout were stocked in the lake. Since then, the Department has gradually increased the size of the plant so that now about 200,000 are planted each year.

Since the fall of 1960 a sport fishery for the ELT has developed, now providing quality fishing for large trout. Planted trout weigh about one-half pound each when planted in the spring or fall months. They typically grow to about two pounds after one year in the lake and to over three pounds after two years in the lake. Six-pound ELT are not uncommon and trout to nearly 12 pounds are caught occasionally. The exceptional size of trout in the catch is due to their rapid growth rate and angling regulations which limit their harvest. ELT feed extensively on small invertebrates and on the native minnows, primarily tui chubs.

The rehabilitation of the ELT has been tremendously successful. From a handful of spawners in 1956, the spawning runs have increased to thousands of spawning fish

Job 1. Survey Pine Creek (about 13 miles of stream, numerous potholes, seeps and springs and five lakes).

	1995/96 FY	1996/97 FY	1997/98 FY
Temporary help, (includes data summary and report writing assistance)	$10,500		$ 1,654
General expense	600		100
Vehicle operation (2 vehicles 75 miles/day, 50 days, $.25/mile)	1,875		375
Invertebrate surveys and report	$ 7,600		$ 5,880
Subtotal	$20,575		$ 8,009
Administrative overhead at 22.5%	$ 4,629		$ 1,802
Total Federal share	$25,204		$ 9,811
Total State share	$ 8,401		$ 3,270
Total	$33,605		$13,081

Job 2. Chemical Treatment

Temporary help (2 months)		$ 3,150	
General expense travel (for permanent and temporary employees)		$ 7,000	
Equipment rental, fuel		$ 5,000	
Rotenone (418 gallons at $55/gallon)		$22,990	
Subtotal		$38,140	
Administrative overhead at 22.5%		$ 8,582	
Total Federal Share		$46,722	
Total State Share		$15,574	
Total		$62,296	

Job 3. Spawning Run Management

Temporary help (3 months)	$ 4,500	$ 4,725	$ 4,961
General expense	$ 300	$ 315	$ 331
Vehicle operation (40 miles/day 20 days/month, 3 months at $.25/mile in 1995-96 FY and $.26/mile in 1996-97 FY)	$ 600	$ 624	$ 655
Subtotal	$ 5,400	$ 5,664	$ 5,947
Administrative overhead at 22.5%	$ 1,215	$ 1,274	$ 1,338
Total Federal Share	$ 6,615	$ 6,938	$ 7,285
Total State Share	$ 2,205	$ 2,313	$ 2,428
Total	$ 8,820	$ 9,251	$ 9,713

	1995/96 FY	1996/97 FY	1997/98 FY
Grand Total (Jobs 1, 2 and 3)			
Total Federal Share	$31,819	$53,660	$17,096
Total State Share	$10,606	$17,887	$ 5,698
Total	$42,425	$71,547	$22,794

14. **Other Information:** this proposed project has been developed in coordination with the PCCRMP which involves representation from the public, Lassen County, Department of Fish and Game, US Forest Service, USFWS, grazing interests and sportsmen.

DW/mrw:IFD1 WINHAMPP.ESA

WATER BODY FACT SHEET

Water Body Name: **EAGLE LAKE (2)** **HU No.** 637.30

Total Areal Extent: 25,000 ac. **Resource Type:** Lakes and Reservoirs

CWS Rating: Res. Val. 2; Uniqueness: 1 ; Magnitude Use: 2

Location: Lassen County

SUMMARY OF PROBLEM(S) OR CONCERN(S)

Type of Problem/Need: Fish kills
Elevated fish tissue levels
Eutrophication

Problem/need(s) and Source Description: Includes all surface waters of HU. (See also Fact Sheet for Eagle Lake ground water basin.) Supports $1 million fishery for rare trout; has large breeding bird colonies. Lake is DFG "Pelican Point Significant Natural Area" (SNA) for Eagle Lake rainbow trout, Eagle Lake tui chub, double-crested cormorant, California gull. (Cone Springs in watershed is also SNA for federal candidate Eagle Lake monkeyflower.) Sandhill cranes are also found in the watershed. Over 200,000 visitor days/year, estimated 1 million angler hours/yr. **Problems:** Local DO sag/fish kills, periodic algae blooms. TSMP elevated Cu, possible ambient Pb problems, pH criteria violations. Identified by Regional Board staff as "highly erosive watershed". Erosion, sedimentation, reduced flow in tributaries related to livestock grazing problems. Grant-funded CRMP habitat restoration projects under way for lake shore and Pine Creek (2). Watershed is septic system prohibition area. **Needs:** planning, monitoring (especially metals monitoring to identify source of elevated fish tissue levels); further watershed restoration, NPS control, including continued Regional Board staff participation in CRMP process; TMDL development.

Concern 1

1. **Specific Location:** entire lake I
2. **Type of Pollutants/Parameters:** NUT
3. **Method of Assessment:** Measured
4. **Water Quality Impaired or Threatened:** Impaired-2
5. **Major Beneficial Use Category Affected:** Aquatic
6. **Type of Source(s):** ONSI, RANG, ONPS
7. **Areal Extent:** 25,000 ac.
8. **Programs Affected:** WQC-PLAN, MONITOR, NPS, WDRNON15

Concern 2*

1. entire lake II
2. MET
3. Measured
4. Impaired-3
5. Aquatic
6. NATU, LDEV, HIMA, UNKN
7. 25,000 ac.
8. WQC-PLAN, MONITOR, NPS, WDRNON15

Concern 3*

1. entire lake III
2. SED
3. Best Professional Judgement
4. Impaired-
5. Aquatic
6. RANG, UNPS
7. 25,000 ac.
8. MONITOR, WQC-PLAN, NPS

Concern 4*

1. middle and north basins
2. DOX, ACI
3. Measured
4. Impaired-2
5. Aquatic
6. ONSI, RANG, ONPS
7. 125,000
8. WQC-PLAN, WDRNON15, MONITOR, NPS

Concern 5*

1. wetlands
2. HAB
3. Best Professional Judgement
4. Threatened-3
5. Aquatic
6. RANG
7.
8. MONITOR, WQC-PLAN, NPS

Concern 6*

1. Pine Creek (2)
2. SED, HAB, FLO, MET
3. Measured
4. Impaired-1
5. Aquatic
6. RANG, UNPS
7. 34e mi.
8. MONITOR, NPS

Concern 7*

1. Triangle Lake
2. ACI
3. Measured
4.
5. Aquatic
6. NATU, ATMO
7. 38 ac
8. MONITOR, NPS

Concern 8*

1. Cone Springs
2. HAB
3. Best Professional Judgement
4. Threatened-
5. Aquatic
6.
7. 1e ac.
8. MONITOR, NPS

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e = areal extent of problem is estimated
* numbered parameters are for the same information categories as in Concern 1.

Date Last Updated: 4/6/94