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ANNUAL REPORT
MOKELUMNE RIVER FISH INSTALLATION 1981-82

by

Philo F. Jewett
Region 2, Inland Fisheries

Anadromous Fisheries Branch
Administrative Report No. 82-29

1982

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ABSTRACT

This report describes the operation of the Mokelumne River Fish Installation from 1 July 1981 through 30 June 1982. The installation consists of a hatchery, rearing ponds, and spawning channel for chinook salmon, Oncorhynchus tshawytscha, and steelhead trout, Salmo gairdneri.

We received 2,149,320 eyed eggs from Nimbus Hatchery. No eggs were taken from Mokelumne River salmon this season.

We released 1,075,078 salmon fingerlings and yearlings during the 1981-82 season.

There were 148,320 eyed steelhead trout eggs received from Nimbus Hatchery. We released 31,100 steelhead yearlings in the Mokelumne River and 20,250 in Lake Merced in San Francisco, as catchable trout.

^{1/} Anadromous Fisheries Branch Administrative Report No. 82-29
Submitted December 1982.

INTRODUCTION

This is the 19th annual report of the Mokelumne River Fish Installation. It covers the period of operation from 1 July 1981 through 30 June 1982.

Copies of previous annual reports are available upon request from the Anadromous Fisheries branch, Rancho Cordova.

The Mokelumne River Fish Installation is located on the south bank of the Mokelumne River at the base of Camanche Dam in San Joaquin County. Camanche Dam is the upper limit of anadromous fish migration in the river.

The Mokelumne River enters the San Joaquin about 98 km downstream from the dam.

The Installation was constructed to compensate for the loss of fall-run chinook salmon and steelhead trout spawning and rearing areas inundated by Camanche Dam. It is operated by the California Department of Fish and Game. The East Bay Municipal Utility District paid construction costs and also pays the annual operation and maintenance cost for the mitigation portion.

The Installation is made up of two parts: (1) a spawning channel for natural spawning and rearing of fall-run chinook salmon and (2) hatchery and rearing pond facilities for artificial spawning of salmon and steelhead. A detailed description of the original facility appears in the first annual report (Groh 1965).

During the spring of 1979 the first loop of the spawning channel was modified to form two 250-ft and two 500-ft rearing ponds to rear 1,000,000 yearling chinook salmon each year. The operational cost of this program is funded by funds generated by the sale of an annual salmon stamp to all commercial salmon fishermen.

WATER TEMPERATURES

Water temperatures were recorded continuously. Maximum and minimum recorded temperatures were 14.4° C (58° F) and 08.9° C (48° F), respectively (Appendix).

COPPER AND ZINC LEVELS

In only 3 of the 19 years of operation have copper and zinc concentrations become high enough to cause significant mortalities. Considerable remedial work has been done at the source of pollution. This season zinc concentrations ranged from less than 0.01 to 0.07 ppm.

DISEASE

There were no significant mortalities caused by disease this season.

PUBLIC RELATIONS

During the 1981-82 season an estimated 14,000 persons visited the facility. Tours were conducted for special interest groups and talks were given to sportsmen and civic organizations.

PRODUCTION SUMMARY

A total of 2,149,320 chinook salmon and steelhead eggs was received for rearing (Table 1).

TABLE 1. Production Summary, Mokelumne River Fish Installation, 1981-82

Species	Number of adults received	Number of eggs received	Number of fingerlings received	Number of fingerlings planted	Number of yearlings planted	On hand 6/30/82
Chinook	1,386	2,001,000	-0-	34,000	1,041,078	1,198,750
Steelhead	-0-	148,320	-0-	-0-	51,530	99,460

CHINOOK SALMON MAINTENANCE

One thousand three hundred eighty-six adult chinook salmon entered the installation from 13 October 1981 to 18 December 1981: 572 males, 324 grilse, and 490 females. This is the largest number of adults that have ever entered this facility. Thirty-eight males, 7 grilse, and 30 females with the adipose fin removed, were received.

PRODUCTION

On 1 July 1981, we had 1,473,350 Nimbus and 94,810 Mokelumne River fingerlings on hand 1980 BY. We received 2,001,000 eyed eggs from the Nimbus Hatchery (1981 BY). On 30 June 1982, we had 1,198,750 Nimbus fingerlings 1981 BY on hand.

Planting 1981-82 Chinook Salmon

We planted 34,000 1980 BY fingerlings and 1,041,078 1980 BY yearlings, for a total of 1,075,078 chinook salmon (Table 2).

TABLE 2. Chinook Salmon Planting Summary, Mokelumne River Fish Installation, 1981-82

Date	Area	Number	Size/lb	Mark
Oct. 1981	Rio Vista	51,940	10	
Oct. 1981	Rio Vista	212,803	7.2	
Nov. 1981	Rio Vista	220,500	12.3	
Nov. 1981	Mokelumne River	72,000	12	
Nov. 1981	Rio Vista	366,405	11.9	
Nov. 1981	Rio Vista	31,200	13	AD-CWT
Nov. 1981	Vallejo	34,000	20	AD-CWT
Dec. 1981	Rio Vista	56,200	11	
Dec. 1981	Mokelumne River	30,030	11	

Chinook Salmon Tagging Program

Two groups of yearlings marked with an adipose clip and a coded wire tag were released on 6 Nov. 1981 in Carquinez Strait. The second group (31,200) was released on 6 Nov. 1981 in the Sacramento River at Rio Vista.

STEELHEAD PROGRAM

On 1 July 1981, we had 12,844 fish from the 1980 BY and 68,700 fish from the 1981 BY on hand. In February 1982, we received 148,320 eyed eggs from the Nimbus Hatchery (1982 BY). We released into the Mokelumne River 12,620 (1980 BY) and 18,480 (1981 BY) as catchable trout. In addition, we released 20,250 in Lake Merced in San Francisco (1981 BY). On 30 June 1982 we had 20,580 fish from the 1981 BY and 78,880 fish from the 1982 BY on hand.

REFERENCES

Groh, Frederick H. 1965 Annual Report Mokelumne River Fish Installation January 1, 1964 to June 30, 1965. Calif. Dept. Fish and Game, Inland Fish. Admin. Rep. 65-21 28p.

APPENDIX TABLE 1. Water Temperatures and Zinc Concentrations, Mokelumne River Fish Installation, 1981-82 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
July					Aug.				
1	13.3	12.8			1	13.9	12.8		
2	13.3	12.8			2	13.9	12.8		
3	13.3	12.8			3	13.9	12.8		
4	13.3	12.8			4	13.9	12.8		
5	13.3	12.8			5	13.9	12.8		
6	13.3	12.8			6	13.9	12.8		
7	13.3	12.8			7	13.9	12.8		
8	13.9	12.8			8	13.9	12.8		
9	13.9	12.8			9	13.9	12.8		
10	13.9	12.8			10	13.9	12.8		
11	13.9	12.8			11	13.9	12.8		
12	13.9	12.8			12	13.9	12.8		
13	13.9	12.8			13	13.9	12.8		
14	13.9	12.8			14	13.9	12.8		
15	13.9	12.8			15	13.9	12.8		
16	13.9	12.8			16	13.9	12.8		
17	13.9	12.8			17	13.9	12.8		
18	13.9	12.8			18	13.9	12.8		
19	13.9	12.8			19	13.9	11.7		
20	13.9	12.8			20	13.9	11.7		
21	13.9	12.8			21	13.9	12.8		
22	13.9	12.8			22	13.9	12.8		
23	13.9	12.8			23	13.9	12.8		
24	13.9	12.8			24	13.9	12.2		
25	13.9	12.8			25	13.9	11.1		
26	13.9	12.8			26	13.3	13.3		
27	13.9	12.8			27	13.3	13.3		
28	13.9	12.8			28	13.3	13.3		
29	13.9	12.8			29	13.3	13.3		
30	13.9	12.8			30	13.3	13.3		
31	13.9	12.8			31	13.3	13.3		

APPENDIX TABLE 1. Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1981-82 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Sept.					Oct.				
1	13.3	13.3			1	14.4	13.9		
2	13.3	13.3			2	13.9	13.3		
3	13.9	13.9			3	13.9	13.3		
4	13.9	13.9			4	13.9	13.3		
5	13.9	13.9			5	13.9	13.3		
6	13.9	13.9			6	13.9	13.3		
7	13.9	13.9			7	13.9	13.9		
8	13.9	13.9			8	13.9	13.9		
9	13.9	13.3			9	13.9	13.9		
10	13.9	13.3			10	13.9	13.9		
11	13.9	13.3			11	13.3	13.3		
12	13.9	13.3			12	13.9	13.9		
13	13.9	13.3			13	13.9	13.9		
14	13.9	13.3			14	13.9	13.3		
15	13.9	13.3			15	13.9	13.3		
16	13.9	12.8			16	13.9	13.3		
17	13.9	12.8			17	13.9	13.3		
18	13.9	12.8			18	14.4	13.3		
19	13.9	12.8			19	14.4	13.3		
20	13.9	12.8			20	14.4	13.9		
21	13.9	12.8			21	14.4	13.9		
22	13.3	12.8			22	14.4	13.3		
23	13.3	12.8			23	14.4	13.3		
24	13.3	12.8			24	14.4	13.3		
25	13.3	12.8			25	14.4	13.3		
26	13.9	12.3			26	13.9	13.9		
27	13.3	12.8			27	14.4	13.9		
28	13.3	13.3			28	13.9	13.9		
29	13.8	13.3			29	13.9	13.3		
30	13.9	13.3			30	13.9	13.9		
					31	14.4	13.3		

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Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Nov.					Dec.				
1	14.4	13.3			1	14.4	14.4		
2	14.4	13.3			2	13.9	13.9		
3	14.4	13.9			3	13.9	13.9		
4	13.9	13.9			4	13.9	13.9		
5	13.9	13.9			5	13.9	13.9		
6	13.9	13.9			6	13.9	13.9		
7	13.9	13.9			7	13.9	13.9		
8	13.9	13.9			8	13.9	13.9		
9	13.9	13.9			9	13.9	13.9		
10	14.4	13.9			10	13.3	13.3		
11	13.9	13.9			11	13.3	13.3		
12	13.9	13.9			12	13.3	13.3		
13	13.9	13.9			13	13.3	13.3		
14	13.9	13.9			14	13.3	13.3		
15	13.9	13.9			15	13.3	13.3		
16	13.9	13.9			16	13.3	13.3		
17	13.9	13.9			17	13.3	13.3		
18	13.9	13.9			18	13.3	13.3		
19	13.9	13.9			19	13.3	13.3		
20	13.9	13.9			20	13.3	13.3		
21	13.9	13.9			21	13.3	13.3	0.01	
22	13.9	13.9			22	13.3	13.3	0.01	
23	13.9	13.9			23	12.8	12.8	0.01	
24	13.9	13.9			24	12.8	12.8	0.01	
25	12.8	12.8			25	12.8	12.8	0.01	
26	14.4	14.4			26	12.8	12.8	0.01	
27	14.4	13.9			27	12.8	12.2	0.01	
28	14.4	14.4			28	12.2	12.2	0.01	
29	14.4	14.4			29	12.2	12.2	0.01	
30	14.4	14.4			30	12.2	12.2	0.01	
					31	12.2	11.7	0.01	

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Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Jan.					Feb.				
1	12.2	11.7	0.01		1	09.4	08.9	0.01	
2	12.2	11.7	0.01		2	09.4	08.9	No Sample	
3	11.7	11.1	0.01		3	09.4	08.9	0.01	
4	11.1	11.1	0.01		4	09.4	08.9	No Sample	
5	11.1	11.1	0.01		5	09.4	08.9	0.02	
6	10.6	10.0	0.01		6	09.4	08.9	0.01	
7	10.6	10.0	0.01		7	09.4	08.9	0.01	
8	10.6	10.0	0.01		8	09.4	08.9	0.03	
9	10.6	10.0	0.01		9	09.4	08.9	0.02	
10	10.0	09.4	0.01		10	09.4	08.9	0.04	
11	10.0	09.4	0.01		11	09.4	08.9	0.04	
12	10.0	09.4	0.01		12	09.4	08.9	0.04	
13	09.4	09.4	0.01		13	09.4	08.9	0.03	
14	09.4	08.9	0.01		14	09.4	08.9	0.03	
15	09.4	08.9	0.01		15	09.4	08.9	0.04	
16	08.9	08.9	0.01		16	10.0	08.9	0.02	
17	08.9	08.9	0.01		17	09.4	08.9	0.02	0.02
18	08.9	08.9	0.01		18	09.4	08.9	0.02	0.03
19	08.9	08.9	0.01		19	09.4	08.9	0.02	0.02
20	09.4	08.9	0.01		20	09.4	08.9	0.02	0.02
21	09.4	08.9	0.01		21	09.4	08.9	0.03	0.02
22	09.4	08.9	0.01		22	09.4	08.9	0.03	0.01
23	09.4	08.9	0.01		23	09.4	08.9	0.02	0.04
24	09.4	08.9	0.01		24	10.0	08.9	0.02	0.04
25	09.4	08.9	0.01		25	10.0	08.9	0.04	0.02
26	09.4	08.9	0.01		26	10.0	08.9	0.02	0.03
27	09.4	08.9	0.01		27	10.0	08.9	0.03	0.02
28	09.4	08.9	0.01		28	10.0	08.9	0.02	0.02
29	09.4	08.9	0.01						
30	09.4	08.9	0.01						
31	09.4	08.9	0.01						

APPENDIX TABLE 1. Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1981-82 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Mar.					April				
1	10.6	09.4	0.02	0.02	1	11.1	10.0	0.02	0.02
2	10.6	09.4	0.02	0.02	2	11.1	10.0	0.02	0.02
3	09.4	09.4	0.02	0.03	3	11.1	10.0	0.02	0.02
4	09.4	09.4	0.03	0.03	4	10.6	10.0	0.02	0.03
5	09.4	09.4	0.04	0.03	5	10.6	10.0	0.04	0.04
6	09.4	09.4	No Sample		6	10.6	10.0	0.04	0.04
7	09.4	09.4	0.03	0.03	7	10.0	10.0	0.04	0.04
8	10.0	09.4	0.03	0.04	8	10.0	09.4	0.04	0.04
9	10.0	09.4	0.03	0.03	9	10.0	09.4	0.04	0.03
10	10.0	10.0	0.04	0.04	10	11.1	10.0	0.03	0.02
11	09.4	09.4	0.04	0.03	11	11.1	10.0	0.02	0.02
12	09.4	09.4	0.03	0.04	12	10.6	10.0	0.03	0.03
13	09.4	09.4	0.03	0.04	13	11.1	10.6	0.03	0.03
14	09.4	09.4	0.04	0.04	14	10.6	10.0	0.04	0.04
15	09.4	09.4	0.05	0.03	15	10.6	10.0	0.04	0.04
16	09.4	09.4	0.04	0.05	16	11.1	10.0	0.04	0.03
17	09.4	08.9	0.04	0.05	17	11.1	10.0	0.03	0.03
18	09.4	08.9	0.04	0.04	18	11.1	10.0	0.03	0.04
19	09.4	08.9	0.04	0.04	19	11.1	10.0	0.02	0.02
20	09.4	08.9	0.04	0.04	20	11.1	10.6	0.03	0.02
21	09.4	08.9	0.04	0.04	21	11.1	10.6	0.03	0.02
22	09.4	08.9	0.03	0.07	22	11.1	10.6	0.02	0.02
23	10.0	08.9	0.03	0.04	23	11.1	10.6	0.02	0.02
24	08.9	08.9	0.04	0.04	24	11.1	10.6	0.02	0.03
25	08.9	08.9	0.02	0.03	25	11.1	10.6	N. S.	0.03
26	08.9	08.9	0.04	0.04	26	11.1	10.6	0.02	0.02
27	08.9	08.9	0.04	0.04	27	11.1	10.6	0.03	0.03
28	08.9	08.9	0.03	0.04	28	11.1	10.6	0.03	0.01
29	11.1	08.9	0.02	0.01	29	11.1	10.6	0.03	0.02
30	10.0	09.4	0.04	0.03	30	11.1	10.6	0.02	0.02
31	10.0	09.4	0.02	0.02					

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Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
May					June				
1	11.1	10.6	0.02	0.02	1	12.8	12.8	0.01	0.01
2	11.1	10.6	0.02	0.02	2	12.8	12.8	0.02	0.01
3	11.1	10.6	0.01	0.02	3	12.8	12.8	0.02	0.02
4	11.7	11.1	0.02	0.02	4	12.8	12.8	0.02	0.02
5	11.1	11.1	No Sample		5	13.8	13.8	0.02	0.02
6	11.1	11.1	0.03	0.02	6	13.3	13.3	0.01	0.02
7	11.1	11.1	0.02	0.02	7	13.8	13.8	0.02	N.S.
8	11.1	11.1	0.04	0.02	8	13.8	13.8	0.02	0.01
9	11.1	11.1	0.03	0.03	9	13.3	13.3	0.02	0.01
10	11.1	11.1	0.02	0.03	10	13.3	13.3	0.01	0.02
11	11.1	11.1	0.02	0.03	11	13.3	13.3	0.02	0.01
12	11.7	11.1	0.03	0.02	12	13.3	13.3	0.01	0.01
13	11.7	11.1	0.03	0.02	13	13.3	13.3	0.01	0.01
14	11.7	11.1	0.02	0.02	14	13.9	13.3	0.01	0.01
15	11.7	11.1	0.02	0.02	15	13.9	13.3	0.01	0.01
16	11.7	11.1	0.02	0.03	16	13.9	13.3	0.01	0.02
17	11.7	11.7	0.02	0.02	17	13.9	13.3	0.02	0.01
18	12.2	11.7	0.02	0.02	18	13.9	13.3	0.01	0.02
19	11.7	11.7	0.02	0.02	19	13.9	13.3	0.02	N.S.
20	12.2	11.7	0.02	0.02	20	13.9	13.3	0.01	0.07
21	12.3	12.8	0.02	0.02	21	13.9	13.3	0.01	0.01
22	12.3	12.8	0.02	0.02	22	13.9	13.3	0.01	0.02
23	12.3	12.8	0.02	0.02	23	13.9	13.3	0.01	0.01
24	12.8	12.8	0.02	0.02	24	13.9	13.3	0.01	0.01
25	12.8	12.8	0.02	0.02	25	13.9	13.3	0.01	N.S.
26	12.8	12.8	0.02	0.02	26	13.9	13.3	0.01	N.S.
27	12.8	12.8	0.02	0.02	27	13.9	13.3	0.01	0.02
28	12.3	12.8	0.02	0.01	28	13.9	13.9	0.01	0.01
29	12.8	12.8	0.01	0.01	29	13.9	13.3	0.7	0.01
30	12.3	12.8	0.01	0.01	30	13.9	13.3	0.01	0.02
31	12.3	12.8	0.02	N.S.					