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ANNUAL REPORT
VAN ARSDALE FISHERIES STATION, 1987-88

by

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Region 3, Inland Fisheries

Inland Fisheries
Administrative Report No. 90-5
1990

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ABSTRACT

This report describes the operation of Van Arsdale Fisheries Station (Snow Mountain Station), Mendocino County, California, for the 1987-88 season. Steelhead, Oncorhynchus mykiss and chinook salmon, O. tshawytscha, counts have been made at this station since 1933.

During the season, 1,080 chinook salmon and 2,208 steelhead were trapped.

A total of 75,181 yearling steelhead reared at Mad River Hatchery was imprinted and released at Van Arsdale Station in 1988.

Approximately 150,000 steelhead eggs were collected at the Station and shipped to Silverado Fisheries Base. No chinook salmon eggs were collected.

A tagging and monitoring study was done with adult salmon and steelhead to assess their ability to find a redesigned fish ladder.

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INTRODUCTION

Van Arsdale Fisheries Station is located approximately 25 miles northeast of Ukiah, Mendocino County, California. It is on the main stem Eel River at Cape Horn Dam, which impounds Van Arsdale Reservoir. The Station was constructed by Snow Mountain Light and Power Company in 1907 and subsequently sold to the Pacific Gas and Electric Company (PG&E) in 1930. The Cape Horn Dam fish ladder is maintained by PG&E; the fisheries station is maintained by the California Department of Fish and Game.

METHODS

The upstream migrant fish trap was placed into operation on 13 November 1987 and remained in continuous operation until 1 June 1988. The trap was checked and serviced daily during this period.

Adult steelhead selected for spawning were placed in a separate holding pen until they were ripe.

Selected groups of salmon and steelhead were removed from the trap, tagged, and released into the Eel River below the ladder to evaluate the effectiveness of fish ladder modifications accomplished by PG&E in the summer of 1987.

All fish not selected for spawning or tagging were passed upstream on the day of their capture.

All trapped fish were recorded by species, sex, origin, state of maturity, and general condition (Appendix Table 1). Annual counts of steelhead and chinook are provided for the period 1933-34 through 1987-88 (Appendix Table 2).

Environmental data were recorded daily, usually between 0700 and 0900 hours. Eel River flow was measured at a PG&E gauging station (E-11) located immediately downstream of Cape Horn Dam (Appendix Table 1) and temperatures recorded daily (Appendix Figure 1).

STEELHEAD PROGRAM

The first steelhead was trapped on 4 December 1987 and the last on 9 May 1988. A total of 2,208 was trapped, consisting of 818 males, 1,379 females, and 11 subadults (Appendix Table 1).

Approximately 150,000 eggs were taken in three spawnings. Eggs were shipped to Silverado Fisheries Base for incubation but were destroyed after a viral disease (IHN) was cultured from the parent fish.

A total of 76,930 marked yearling steelhead was reared at Mad River Hatchery then transported to Van Arsdale Station for imprinting. Seven thousand unmarked yearling steelhead reared at Mad River were released below Van Arsdale without imprinting. Imprinted fish were shipped in three groups with each group marked with different fin clip combinations (Appendix Table 3). The purpose of marked fish releases was to assess survival of outmigrating smolts under different river flow regimes. A summary of methods and results from marked and tagged fish releases may be found in a report by Steiner Environmental Consultants (SEC) entitled Potter Valley Project, Effects of Operations on Anadromous Salmonids.

CHINOOK SALMON PROGRAM

The first chinook was trapped on 1 December 1987 and the last on 13 January 1988. A total of 1,080 was trapped, including 540 males, 475 females, and 65 grilse (Appendix Table 1). No chinook eggs were collected this season. The SEC publication summarizes tag and recovery data for fish ladder function studies, as well as fin clip returns from adult upstream migrant salmonids.

APPENDIX TABLE 1. Date of Chinook Salmon and Steelhead Arrivals, Eel River Flow, and Weather Conditions at Van Arsdale Fisheries Station, 1987-88.

Date Dec	Steelhead				Chinook				Eel River (cfs)	Weather
	M	F	T	S/A	M	F	G	T		
1					8	1	1	10	18	Rain
2					55	35	1	91	610	Rain
3					70	58	7	135	224	Rain
4		1	1		48	28	3	79	111	Rain
5	1	4	5		30	29	4	63	90	Rain
6					11	11	4	26	1325	Rain
7	1	1	2	1	10	15		25	220	Rain
8		1	1		16	29	3	48	937	Rain
9					3	5		8	911	Rain
10					3	1		4	4357	Rain
11					2	1		3	4946	Clear
12		1	1		8	5		13	1593	Clear
13					2	2		4	1449	Clear
14		1	1		6	5	1	12	945	Overcast
15					5	7	1	13	419	Overcast
16		1	1		20	11	2	33	313	Rain
17		1	1		15	12	3	30		Clear
18	1	1	2		14	18	2	34	110	Clear
19					13	8	2	23		Overcast
20	2	2	4		34	15	4	53		Overcast
21	2	2	4		34	24	5	63	116	Rain
22	7	14	21		60	47	4	111	116	Clear
23	3	3	6		16	9	3	28		Clear
24					4	8	2	14		Clear
25		2	2		8	6	1	15	116	Clear
26	3	5	8		7	15		22	116	Clear
27	2		2		10	12	3	25	116	Overcast
28	3	1	4		7	16	5	28	116	Rain
29	9	6	15		10	25	2	37	116	Snow
30	2	8	10		3	9	1	13	116	Clear
31	4	4	8		1	0	4		116	Clear

Monthly
totals 40 59 99 1 535 468 64 1067

Previous
totals 0 0 0 0 0 0 0 0

Season
totals 40 59 99 1 535 468 64 1067

* S/A = sub-adult

APPENDIX TABLE 1 (cont)

Date Jan.	Steelhead				Chinook				Eel River (cfs)	Weather
	M	F	T	S/A	M	F	G	T		
1					1	1	1	3	123	Clear
2						1		1	153	Rain
3		3	5	8	3	3		6	452	Rain
4									5182	Rain
5		4	4	8	1			1	3640	Clear
6		4	8	12					1583	Clear
7		12	14	26					1020	Clear
8		9	16	25					904	Rain
9		11	14	25					1848	Rain
10		14	20	34		1		1	2475	Overcast
11		1	2	3					4240	Overcast
12		4	1	5					2961	Clear
13		16	22	38		1		1	1848	Rain
14		12	15	27					1440	Overcast
15		4	13	17					2824	Overcast
16		3	1	4					2703	Rain
17		17	18	35					2475	Overcast
18		8	4	12					1654	Clear
19		2	3	5					1164	Clear
20		4	7	11					879	Clear
21		3	5	8					728	Clear
22		10	7	17					610	Clear
23		5	6	11					665	Clear
24		1	8	9					665	Clear
25		8	5	13					665	Clear
26		18	17	35					637	Overcast
27		18	18	36					610	Clouds
28		30	34	64					558	Overcast
29		45	66	111					781	Rain
30		22	25	47					1351	Overcast
31		1	0	1					1041	Overcast

Monthly
totals 289 358 647 1 5 7 1 13

Previous
totals 40 59 99 1 535 468 64 1067
Season
totals 329 417 746 2 540 475 65 1080

APPENDIX TABLE 1 (cont)

Date	Steelhead				Chinook				Eel River (cfs)	Weather	
	Feb	M	F	T	S/A	M	F	G			T
1		29	45	74						842	Overcast
2		4	6	10						694	Clear
3		9	6	15						491	Clear
4		4	11	15						447	Clear
5		1	2	3						375	Clear
6		6	15	21						303	Clear
7		10	12	22						262	Clear
8		21	32	53						221	Clear
9		24	37	61						200	Clear
10		12	12	24						191	Clear
11		10	22	32						178	Clear
12		6	12	18						205	Clear
13		1	6	7						171	Clear
14		4	5	9						159	Clear
15		4	7	11						144	Clear
16		4	11	15						138	Clear
17		7	15	22	1					136	Clear
18		29	27	56						131	Clear
19		14	25	39	2					134	Clear
20		11	15	26						127	Clear
21		17	19	36						127	Clear
22		4	14	18	1					125	Clear
23		11	20	31						123	Clear
24		5	5	10						125	Clear
25		5	13	18						123	Overcast
26		10	37	47						123	Overcast
27		17	45	62						123	Overcast
28		28	65	93	1					134	Rain
29		9	19	28						125	Rain
Monthly total		316	560	876	5	0	0	0	0		
Previous total		329	417	746	2	540	475	65	1080		
Season total		645	977	1622	7	540	475	65	1080		

APPENDIX TABLE 1 (cont)

Date	Steelhead				Chinook				Eel River (cfs)	Weather	
	March	M	F	T	S/A	M	F	G			T
1		21	37	58						138	Clear
2		18	34	52	1					131	Clear
3		18	38	56	2					129	Clear
4		12	42	54						123	Clear
5		10	17	27						123	Overcast
6		8	17	25						123	Clear
7		2	8	10						123	Clear
8		10	29	39	1					123	Clear
9			6	6						138	Clear
10		1	4	5						131	Clear
11		4	4	8						131	Clear
12		4	9	13						131	Clear
13		3	6	9						131	Clear
14		7	14	21						131	Clear
15		6	15	21						127	Clear
16		3	9	12						121	Clear
17		7	10	17						125	Clear
18		5	15	20						127	Clear
19		5	17	22						125	Clear
20		6	19	25						125	Clear
21		6	11	17						125	Cloudy
22		1	2	3						125	Clear
23		1	3	4						129	Rain
24										146	Clear
25		2	3	5						133	Clear
26		1	8	9						133	Clear
27		2	4	6						133	Clear
28		3	2	5						133	Clear
29		1	2	3						133	Clear
30		2	1	3						129	Clear
31			1	1						129	Clear
Monthly total		169	387	556	4	0	0	0	0		
Previous total		645	977	1622	7	540	475	65	1080		
Season total		814	1364	2178	11	540	475	65	1080		

APPENDIX TABLE 1 (cont)

Date	Steelhead				Chinook				Eel River (cfs)	Weather	
	April	M	F	T	S/A	M	F	G			T
1	1	4	5							129	Clear
2		1	1							129	Clear
3		1	1							125	Rain
4										123	Clear
5		1	1							123	Clear
6	1	2	3							123	Clear
7		1	1							117	Overcast
8										117	Clear
9		2	2							114	Clear
10										110	Clear
11										108	Clear
12										110	Clear
13										106	Overcast
14										47	Rain
15										37	Overcast
16										32	Overcast
17										31	Clear
18										31	Overcast
19										25	Rain
20		1	1							42	Rain
21										58	Rain
22										29	Rain
23										47	Overcast
24										62	Overcast
25										37	Clear
26		1	1							37	Clear
27										29	Clear
28										29	Overcast
29		1	1							32	Rain
30	Station not operated										
Monthly											
total	2	15	17	0	0	0	0	0			
Previous											
total	814	1364	2178	11	540	475	65	1080			
Season											
total	816	1379	2195	11	540	475	65	1080			

APPENDIX TABLE 1 (cont)

Date	Steelhead				Chinook				Eel River (cfs)	Weather	
	May	M	F	T	S/A	M	F	G			T
1										30	Clear
2										29	Overcast
3										133	Clear
4										97	Clear
5										97	Clear
6										125	Clear
7										159	Overcast
8										171	Rain
9		2		2							Overcast
MONTHLY TOTAL		2		2		0	0	0	0		
PREVIOUS TOTAL	816	1379	2195	11		540	475	65	1080		
SEASON TOTAL	818	1379	2197	11		540	475	65	1080		

APPENDIX TABLE 2. Annual Steelhead and Chinook Salmon Counts, Van Arsdale Fisheries Station, 1933-34 to 1987-88.

<u>Season</u>	<u>Steelhead</u>	<u>Chinook salmon</u>	<u>Season</u>	<u>Steelhead</u>	<u>Chinook salmon</u>
1933-34	3,247		1960-61	1,130	
1934-35	2,225		1961-62	1,693	
1935-36	6,310		1962-63	2,030	9
1936-37	6,861		1963-64	846	3
1937-38	3,413		1964-65	921	108
1938-39	4,786		1965-66	423	94
1939-40	3,990		1966-67	534	119
1940-41	2,228		1967-68	531	
1941-42	no record		1968-69	340	
1942-43	no record		1969-70	719	15
1943-44	no record		1970-71	1,863	47
1944-45	9,528		1971-72	696	
1945-46	5,054		1972-73	586	
1946-47 ^{1/}	4,409	917	1973-74	1,040	12
1947-48	178		1974-75	1,126	1
1948-49	2,433		1975-76	1,077	2
1949-50	no record		1976-77	39	
1950-51	1,091	55	1977-78	590	23
1951-52	5,444		1978-79	106	5
1952-53	2,197		1979-80	87	
1953-54	2,590		1980-81	1,966	
1954-55	6,131		1981-82	646	175
1955-56	3,719		1982-83	369	9
1956-57	4,109		1983-84	1,534	26
1957-58	5,151		1984-85	1,980	153
1958-59	3,335		1985-86 ^{2/}	1,196	961
1959-60	2,206		1986-87 ^{3/}	1,952	1,754
			1987-88	2,208	1,080

^{1/} Forty-seven coho salmon also ascended the fishway during this season.

^{2/} Includes 86 steelhead "half-pounders" and 705 chinook salmon grilse.

^{3/} Includes 487 steelhead "half-pounders" and 485 chinook salmon grilse.

APPENDIX TABLE 3. Juvenile Steelhead Plants, Eel River at Van Arsdale Fisheries Station, 1987-88.

<u>Date received</u>	<u>Date released</u>	<u>Number</u>	<u>Mark*</u>
3/24/88	3/29/88	25,000	LV
4/12/88	4/19/88	24,081**	RV-LV
4/26/88	5/02/88	26,100	RV

*MARK

LV - Left ventral fin

RV - Right ventral fin

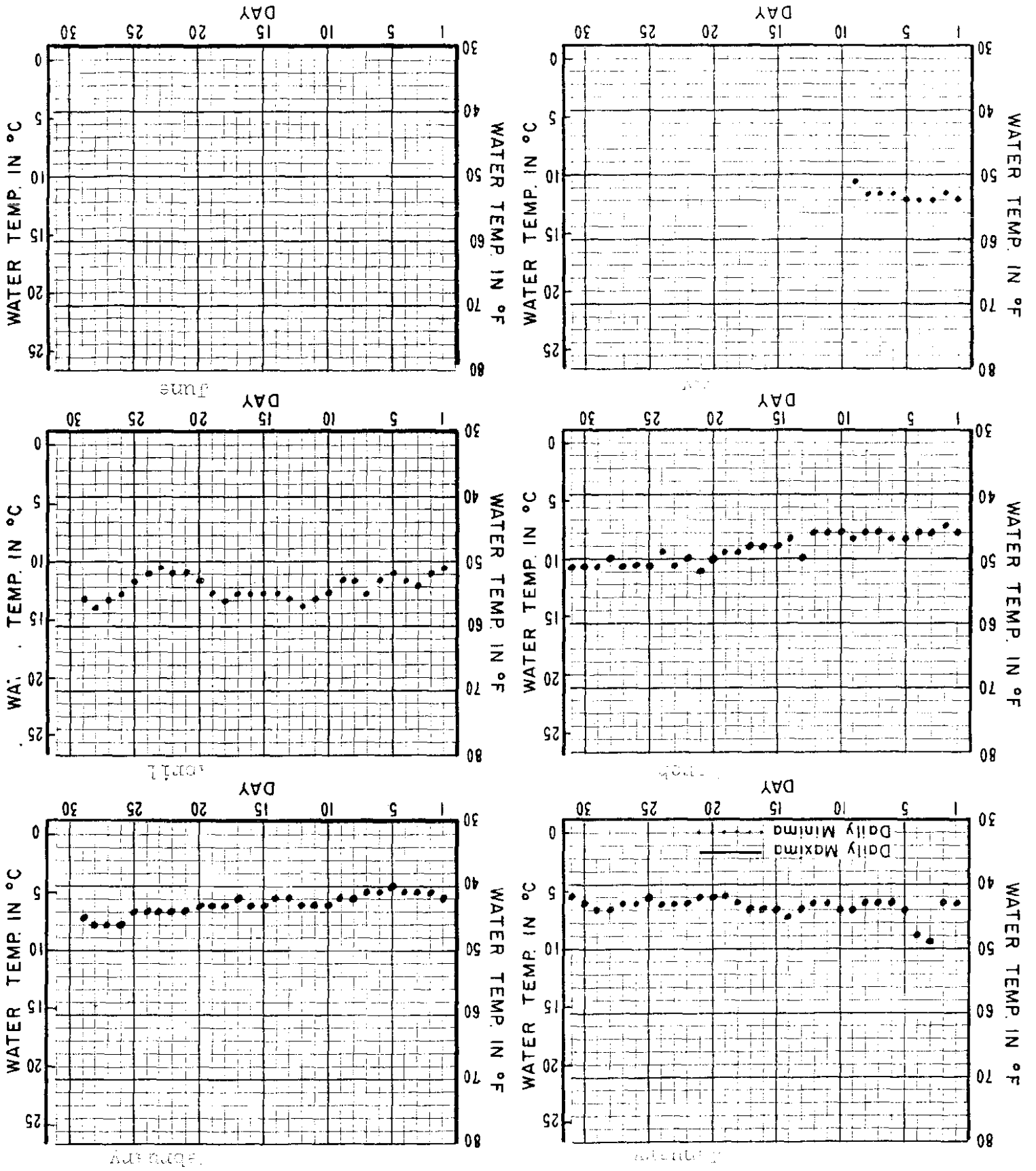
LV-RV - Left ventral and right ventral fins

** Number after 1,747 dead removed

One unmarked group of yearling steelhead was planted, without imprinting, below the station.

<u>Date</u>	<u>Number</u>	<u>Size/lb</u>	<u>From (Hatchery)</u>
3/29/88	11,445	10.9/LB	MAD RIVER

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

