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ANNUAL REPORT
VAN ARSDALE FISHERIES STATION
1983-84

by

Robert W. Rose
Region 3, Inland Fisheries

Anadromous Fisheries Branch
Administrative Report No. 84-07

1984

84-7

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ABSTRACT

This report describes the operations of Van Arsdale Fisheries Station (Snow Mountain Station), Mendocino County, California during the 1983-84 season. Counts of migratory steelhead, Salmo gairdneri, and chinook salmon, Oncorhynchus tshawytscha, have been made at this station annually since 1933. During the season, 1,534 steelhead and 26 chinook salmon were trapped at the station. A total of 234,894 steelhead eggs was collected and eyed prior to shipment to Silverado Field Operations Base. A total of 29,994 chinook salmon eggs was collected and reared at the station, along with a total of 44,070 eggs collected from Outlet Creek. A total of 67,950 juvenile chinook salmon, including 36,560 coded-wire tagged fish, was released into the lower Eel River after rearing water temperatures exceeded the 21°C (70°F) mark in late May.

The tables and appendixs summarize the number of adult fish trapped, egg lots collected, fish planted, Eel River flows, morning water temperatures, and general weather conditions during the 1983-84 steelhead and salmon migration.

^{1/} Anadromous Fisheries Branch Administrative Report No. 84-07.
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INTRODUCTION

Van Arsdale Fisheries Station is located approximately 25 miles northeast of Ukiah, Mendocino County, California on the Eel River at Capehorn Dam, which impounds Van Arsdale Reservoir. The station was constructed by Snow Mountain Light and Power Company in 1907 and subsequently sold to Pacific Gas and Electric Company in 1930. The Capehorn Dam fish ladder is maintained by Pacific Gas and Electric Company; the fisheries station grounds and facilities are maintained by the Department of Fish and Game.

METHODS

The upstream migrant fish trap was placed into operation on 7 November 1983, and remained, with few exceptions, in continuous operation until 12 June 1984. The trap was checked and serviced daily during this period. Adult fish selected for spawning were placed in a separate holding pen for ripening. All other fish were immediately released after species, sex, fork length (FL), origin, state of maturity, and general condition data were collected.

Environmental data were recorded daily between 0900 and 0930 hours. Eel River flow was measured at Pacific Gas and Electric Company gauging station E-11, immediately downstream of Capehorn Dam.

Except for final imprinting of juvenile chinook salmon, all egg incubation and rearing of juvenile fish were conducted utilizing water piped from nearby Capehorn Creek.

1983-84

STEELHEAD PROGRAM

The first steelhead of the season was trapped on 12 November 1983 and the last on 8 May 1984. A total of 1,534 steelhead (535 males, 999 females) was recorded (Appendix 1). No marked fish were observed. A total of 46 females was spawned, yielding 234,894 eggs from both early and late running fish (Table 1). Average fecundity was 5,106 eggs/female; overall fertility was 87%. There was a prespawning mortality of seven males and eight females. A total of 204,803 eyed eggs was shipped to Silverado Field Operations Base, Napa County.

No juvenile steelhead were planted at Van Arsdale Fisheries Station this season.

1983-84

CHINOOK SALMON PROGRAM

The first chinook salmon of the season was trapped on 12 November 1983 and the last on 19 January 1984. A total of 26 chinook salmon (12 males, 13 females, 1 grilse) was recorded (Appendix 1). No marked fish were observed. A total of 10 Van Arsdale strain females was spawned, yielding 29,994 eggs (Table 2). Average fecundity of these fish was 2,999 eggs/female; overall fertility was 87%. There was a prespawning mortality of five males.

An additional 44,070 chinook salmon eggs were collected at Van Arsdale Fisheries Station from 18 females trapped on Outlet Creek, a major chinook salmon spawning tributary of the Eel River located approximately 25 miles downstream of Capehorn Dam. Personnel from the Mendocino County Fish and Game Advisory Committee assisted Department of Fish and Game personnel in this trapping project, which delivered 22 males and 19 females to Van Arsdale Fisheries Station for ripening. There was a prespawning mortality of four males and one female. A total of 7,616 eggs was also collected on site from three females trapped on Long Valley Creek, a tributary to Outlet Creek, and shipped to Van Arsdale Fisheries Station for incubation. Average fecundity of the 21 Outlet Creek strain females spawned was 2,461 eggs/females; overall fertility of the 51,686 total eggs collected was 86%.

A total of 67,950 juvenile chinook salmon, comprised of 26,350 Van Arsdale strain fish averaging 170/lb and 41,600 Outlet Creek strain fish averaging 160/lb, were planted in the main stem Eel River below its confluence with the South Fork on 31 May 1984. Included in this total were 36,560 Outlet Creek strain fish carrying coded wire tags (#6-50-13). All fish were imprinted on Van Arsdale Fisheries Station water, and were moved directly to the planting waters, approximately 75 miles downstream when, afternoon rearing water temperatures exceeded 21°C (70°F) at the Station.

TABLE 1. Van Arsdale Fisheries Station, Mendocino County, Steelhead Production Summary, 1983-84 Season.^{1/}

Date	Numbers of females spawned	Number of green eggs	Fertility	Number of eyed eggs shipped
1-13-84	8	36,498	72%	26,108
1-31-84	4	17,708	75%	13,237
2-15-84	8	42,874	81%	34,830
3-7-84	26	137,814	95%	130,628
Totals	46	234,894	\bar{x} = 87%	204,803

^{1/} All eyed eggs shipped to Silverado Field Operations Base, Napa County.

TABLE 1. Van Arsdale Fisheries Station Chinook Salmon Production Summary, 1983-84 Season.

Date	Number of females spawned	Strain	Number of eggs taken or received	Fertility
12-3-83	2	Outlet Creek	5,185	66%
12-9-83	12	Outlet Creek	28,145	94%
12-14-83	3 ^{1/2}	Long Valley Cr. ^{2/}	7,616	77%
12-15-83	4	Outlet Creek	12,740	86%
12-15-83	6	Van Arsdale	19,040	86%
12-23-83	1	Van Arsdale	2,470	54%
12-26-83	1	Van Arsdale	2,625	99%
12-29-83	2	Van Arsdale	5,859	99%
Totals	31		81,680	\bar{x} = 87%

^{1/} Eggs collected on site and shipped green to Van Arsdale Fisheries Station.

^{2/} Tributary to Outlet Creek, Mendocino County.

APPENDIX TABLE 1. Date of Salmon and Steelhead Arrivals, Air and Water Temperatures, and General Weather Conditions, Van Arsdale Fisheries Station, 1983-84 Migration Season.

Date	Steelhead			Chinook salmon			Total	Water temp. (°F @ 0900)	Eel River (cfs)	Weather
	Male	Female	Total	Male	Female	Grilse				
Nov. 1										
2										
3										
4										
5										
6										
7										
8								55	11	Overcast
9								52	11	Partly Cloudy
10										
11								52	142	Partly Cloudy
12	0	1	1	0	0	1	1	52	151	Rain
13	1	1	2					51	151	Rain
14	0	3	3	1	1	0	2	49	116	Clear
15								49	50	Partly Cloudy
16								50	259	Overcast
17								50	2,360	Cloudy
18				0	1	0	1	50	3,160	Partly Cloudy
19								51	2,070	Rain
20										
21								48	2,860	Cloudy
22								48	1,920	Clear
23								48	1,600	Light Rain
24										
25										
26										
27										
28								45	1,550	Clear
29								45	1,140	Clear
30										
Nov. Totals	1	5	6	1	2	1	4			

Date	Steelhead			Chinook salmon			Water Temp. (°F @ 0900)	Eel River (cfs)	Weather
	Male	Female	Total	Male	Female	Total			
Dec. 1	Unattended								
2	1	1	2				47	645	Partly cloudy
3	Unattended								
4	Unattended								
5	Unattended								
6									
7	1	3	4	3	1	4	46	1,330	Light Rain
8	1	1	2				47	4,740	Overcast
9							47	4,770	Clear
10	2	2	4	3	0	3	47	8,065	Rain
11							47	9,710	Light Rain
12	1	1	2				48	8,312	Cloudy
13	1	1	2	1	4	5	47	7,250	Overcast
14	1	1	2	1	0	1	48	4,350	Light Rain
15				1	0	1	48	3,790	Light Rain
16				1	0	1	48	3,310	Clear
17	0	1	1				48	2,740	Overcast
18							48	2,340	Clear
19	1	2	3	0	1	1	48	1,900	Overcast
20	2	0	2				48	1,600	Clear
21	0	1	1				46	1,160	Foggy
22							45	967	Overcast
23							45	782	Cloudy
24	1	0	1				44	830	Snow
25	5	2	7				45	5,660	Rain
26	0	1	1	0	1	1	45	13,500	Rain
27	2	4	6	2	1	3	45	9,938	Rain
28	2	3	5				47	7,752	Overcast
29	1	3	4				50	3,010	Cloudy
30	12	17	29				48	3,460	Rain
31	1	0	1				50	6,430	Rain
Dec.							51	5,150	Cloudy
Totals	34	43	77	11	8	19			

Date 1983	<u>Steelhead</u>			<u>Chinook salmon</u>				<u>Water temp.</u>	<u>Eel River</u>	<u>Weather</u>
	Male	Female	Total	Male	Female	Grilse	Total	(°F @ 0900)	(cfs)	
Jan. 1								46	4,890	Clear
2	9	7	16					47	2,590	Clear
3								47	2,220	Clear
4	1	1	2					46	1,800	Clear
5								46	1,650	Clear
6								47	1,290	Clear
7	2	1	3					46	1,080	Foggy
8	4	5	9					47	914	Overcast
9	7	16	23					46	759	Clear
10	22	36	58	0	1	0	1	47	673	Overcast
11	19	27	46					No data		
12	24	30	54	0	1	0	1	45	581	Clear
13	6	5	11					45	457	Clear
14	3	2	5					43	329	Partly Cloudy
15	2	7	9					44	337	Light Rain
16	47	56	103					44	384	Clear
17	20	36	56					44	321	Clear
18	11	14	25					43	273	Clear
19	4	6	10	0	1	0	1	43	233	Clear
20								43	209	Clear
21	3	4	7					44	198	Overcast
22	2	4	6					44	207	Overcast
23	11	38	49					47	177	Partly Cloudy
24	3	15	18					47	177	Rain
25	11	20	31					47	131	Rain
26	5	12	17					44	151	Clear
27	3	2	5					45	134	Clear
28	3	5	8					44	95	Clear
29	0	1	1					44	103	Clear
30	3	6	9					43	103	Clear
31	8	7	15					43	103	Clear
Jan. Totals	233	363	596	0	3	0	3			

Date	Steelhead		Chinook salmon			Water temp. (°F @ 0900)	Eel River (cfs)	Weather
	Male	Female	Total	Male	Female			
Feb. 1	7	1	8			43	96	Clear
2	1	1	2			43	96	Clear
3						43	116	Clear
4	2	1	3			43	117	Clear
5	0	1	1			44	117	Partly Cloudy
6	1	4	5			44	108	Clear
7	2	9	11			44	106	Clear
8	9	14	23			44	103	Rain
9	14	23	37			46	123	Rain
10	6	5	11			44	133	Overcast
11	7	4	11			44	112	Light Rain
12	33	51	84			44	335	Overcast
13	11	34	45			44	243	Rain
14	18	49	67			44	2,370	Rain
15	9	23	32			45	5,120	Rain
16	8	12	20			44	4,180	Clear
17	3	8	11			44	2,715	Clear
18	7	14	21			46	2,100	Clear
19	14	15	29			46	1,565	Clear
20	0	7	7			47	1,270	Overcast
21	3	7	10			44	1,210	Cloudy
22						44	No data	Clear
23	0	4	4			44	967	Partly Cloudy
24	3	3	6			47	854	Rain
25						47	767	Cloudy
26	2	2	4			44	652	Clear
27	3	23	26			44	577	Overcast
28	4	6	10			44	462	Overcast
29	5	21	26			46	407	Rain
Feb. Totals	172	342	514	0	0			

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0
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Date 1983	<u>Steelhead</u>			<u>Chinook salmon</u>				<u>Water temp.</u>	<u>Eel River</u>	<u>Weather</u>
	Male	Female	Total	Male	Female	Grilse	Total	(° F @ 0900)	(cfs)	
Mar. 1	6	9	15					46	362	Light Rain
2	7	20	27					47	333	Clear
3	3	17	20					46	302	Clear
4	4	5	9					46	256	Clear
5	0	3	3					46	241	Clear
6	5	7	12					47	218	Clear
7	6	15	21					48	190	Clear
8	2	6	8					46	167	Clear
9	4	4	8					46	146	Clear
10	2	3	5					47	127	Clear
11	3	7	10					46	112	Overcast
12	5	8	13					47	103	Clear
13	8	19	27					48	91	Rain
14	2	4	6					49	2,090	Rain
15	3	4	7					50	No data	Rain
16	1	5	6					48	2,400	Rain
17	3	1	4					48	2,980	Clear
18								48	2,240	Clear
19	3	3	6					49	1,850	Clear
20	3	12	15					50	1,595	Clear
21	0	2	2					50	1,350	Clear
22	0	5	5					48	1,030	Clear
23	2	4	6					48	931	Clear
24								48	701	Clear
25	1	3	4					49	639	Overcast
26	3	5	8					49	510	Overcast
27	0	6	6					49	472	Clear
28	4	21	25					50	380	Clear
29	1	9	10					50	321	Clear
30	3	8	11					50	264	Partly Cloudy
31	1	7	8					50	239	Rain
Mar. Totals	85	222	307	0	0	0	0			

Date 1983	Steelhead			Chinook salmon			Water temp. (°F @ 0900)	Eel River (cfs)	Weather
	Male	Female	Total	Male	Female	Total			
Apr. 1	0	2	2				49	266	Partly Cloudy
2							50	227	Clear
3	1	3	4				50	62	Cloudy
4							50	106	Cloudy
5							50	100	Cloudy
6	0	1	1				49	100	Cloudy
7	2	1	3				49	112	Rain
8	0	2	2				50	218	Cloudy
9	3	3	6				48	103	Rain
10							48	447	Rain
11	0	2	2				48	151	Partly Cloudy
12							50	103	Partly Cloudy
13							50	112	Clear
14	1	1	2				53	113	Clear
15							54	118	Clear
16							54	112	Overcast
17	2	1	3				53	108	Clear
18	0	1	1				52	138	Rain
19							50	123	Rain
20							52	119	Clear
21	0	2	2				54	142	Clear
22							55	85	Clear
23							56	71	Clear
24	0	1	1				56	56	Clear
25							52	49	Clear
26							50	47	Rain
27							50	49	Clear
28							52	42	Clear
29							54	44	Overcast
30							54	39	Overcast
Apr. Totals	9	20	29	0	0	0			

Date	Steelhead			Chinook salmon			Water temp. (°F @ 0900)	Eel River (cfs)	Weather
	Male	Female	Total	Male	Female	Total			
1983									
May 1							54	49	Rain
2							52	34	Cloudy
3	1	1	2				54	46	Rain
4	0	2	2				57	39	Partly Cloudy
5							55	34	Clear
6							54	31	Clear
7	0	1	1				55	29	Clear
8							59	23	Clear
9							59	25	Clear
10							58	37	Clear
11							60	33	Overcast
12							61	29	Clear
13							63	30	Clear
14							60	25	Overcast
15							59	44	Clear
16							58	21	Clear
17							56	25	Clear
18							56	63	Clear
19							59	46	Clear
20							60	49	Partly Cloudy
21							60	50	Clear
22							58	49	Clear
23							61	93	Clear
24							58	79	Clear
25							58	79	Clear
26							61	79	Clear
27							62	78	Clear
28							64	76	Clear
29							64	70	Partly Cloudy
30							64	76	Partly Cloudy
31							62	76	Clear
May Totals	1	4	5	0	0	0			
Season Totals	535	999	1,534	12	13	1			

APPENDIX TABLE 3. Annual Steelhead and Chinook Salmon Counts, Jan Anstalaie Fisheries Station 1933 - 1984.

<u>Year</u>	<u>Steelhead</u>	<u>Chinook Salmon</u>
1933-34	3,247	
1934-35	2,255	
1935-36	5,310	
1936-37	5,851	
1937-38	3,413	
1938-39	4,786	
1939-40	3,990	
1940-41	2,228	
1941-42	No records	
1942-43	No records	
1943-44	No records	
1944-45	9,528	
1945-46	5,054	
1946-47	4,409	
1947-48	178	
1948-49	2,433	
1949-50	No records	
1950-51	1,091	
1951-52	5,444	
1952-53	2,197	
1953-54	2,590	
1954-55	6,131	
1955-56	3,719	
1956-57	4,109	
1957-58	5,151	
1958-59	3,335	
1959-60	2,206	
1960-61	1,130	
1961-62	1,693	
1962-63	2,030	9
1963-64	846	3
1964-65	921	108
1965-66	423	34
1966-67	534	119
1967-68	531	
1968-69	340	
1969-70	719	15
1970-71	1,863	47
1971-72	696	
1972-73	586	
1973-74	1,040	12
1974-75	1,126	1
1975-76	1,077	2
1976-77	39	
1977-78	590	23
1978-79	106	5
1979-80	87	
1980-81	1,966	
1981-82	646	175
1982-83	369	9
1983-84	1,534	26