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The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
NIMBUS SALMON AND STEELHEAD HATCHERY, 1991-92

by

Ronald D. Ducey
Region 2, Inland Fisheries

Inland Fisheries
Administrative Report No. 92-11
1991

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ABSTRACT

This report describes the operation of Nimbus Salmon and Steelhead Hatchery from July 1, 1991 through June 30, 1992. Tables present numbers of fish trapped, eggs taken, fish reared and released, and water temperatures. There were 7,128 chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 15,220,840 eggs. There were 1,383 winter-run steelhead, O. mykiss, trapped from which 2,492,425 eggs were taken.

During the year, hatchery personnel planted or transferred a total of 11,070,652 fingerling and 1,557,000 advanced fingerling chinook salmon, and 1,222,641 fingerling and 377,810 yearling steelhead trout.

^{1/} Inland Fisheries Administrative Report No. 92-11.
Submitted August 1992. Edited by K.A. Hashagen,
California Department of Fish and Game, 1416 Ninth Street,
Sacramento CA 95814

INTRODUCTION

This is the 37th annual report for Nimbus Salmon and Steelhead Hatchery. The Hatchery is located on the American River near the base of Nimbus Dam and is operated by the California Department of Fish and Game under contract with the United States Bureau of Reclamation. This report summarizes the Hatchery activities during 1991-92, with particular reference to numbers of fish trapped, spawned, and released, eggs taken and fish produced, and other pertinent information.

PRODUCTION SUMMARY

During 1991-92, hatchery personnel took 17,713,265 eggs and planted or transferred 14,671,203 chinook salmon and steelhead trout (Table 1).

TABLE 1. Production Summary, Nimbus Salmon and Steelhead Hatchery, 1991-92

<u>Species</u>	<u>Eggs taken or received</u>	<u>Eggs or fish transferred</u>	<u>Fingerlings planted</u>	<u>Advanced fingerlings or yearlings planted</u>	<u>Total weight planted(lb)</u>
<u>CHIN</u>					
1990 BY				443,100	8,700
1991 BY	15,220,840	2,049,620	9,218,652	1,557,000	82,058
<u>SH</u>					
1991 BY				377,810	104,500
1992 BY	2,492,425		1,222,641		2,558

HATCHERY OPERATIONS

The weir was installed September 24, 1991, by the Bureau of Reclamation. The weir pickets were lowered and capped on September 26, 1991. The lower gate in the ladder was removed and the holding pond was opened November 4, 1992. Water temperature was 59°F.

Water Temperature Control

Shutter #8 in Folsom Dam was removed July 10, 1992. Shutters #1-7 were removed on October 10, 1991. Hatchery water temperature was 62°F.

Disposal of Salmon Carcasses

Edible carcasses were given to State and County institutions, community action groups, or councils representing local Indians. All inedible carcasses went to a local rendering plant. The total dispensed was 64,000 lb edible and 10,800 lb inedible.

Public Relations

An estimated 532,900 people visited Nimbus Hatchery this year. This number was arrived at by an automatic car counter installed at the parking lot entrance and employee counts of bus passengers and bicyclists. November was the peak month, with an estimated 84,956 visitors.

CHINOOK SALMON MAINTENANCE PROGRAM

Chinook Salmon Counts

The fish ladder was opened November 4, 1991, and the first spawning took place on November 7, 1991. A total of 7,128 salmon entered the holding pond this season, including 3,245 males, 3,524 females, and 359 grilse. Grilse were fish 60 cm (23.6 inches) FL or less (Appendix Table 1). A total of 1,622 carcasses was removed from the weir: 607 males, 829 females, and 186 male and female grilse.

Sorting and Spawning

Of the females counted, 3,010 were spawned, 514 died in the pond, or were released. The spawning season, which began November 7, 1991, and ended December 16, 1991, produced a total of 15,220,840 eggs, for an average of 5,057 eggs per female. Fertility, as determined by the difference between green eggs taken and the total eggs eyed, ranged from 76% to 95%, with an average of 85.5%.

Marked Chinook Salmon Recoveries

All fish were examined for marks as they were processed or removed dead from the holding pond. Heads were removed from all adipose fin-clipped fish for recovery of coded-wire tags (see Appendix Table 2 for tag recovery results).

Chinook Salmon Planting

1990 Brood Year

There were 443,100 chinook salmon on hand July 1, 1991.

1991 Brood Year

We released 10,775,652 fingerlings and advanced fingerlings (Table 2). None of the fish released was coded-wire tagged.

On June 30, 1992, there were approximately 149,200 chinook salmon (1991 brood year) on hand to be released in July 1992.

There were 1,852,000 chinook salmon fingerlings and 197,620 chinook salmon eggs transferred to Mokelumne River Hatchery.

TABLE 2. Planting Data for 1990 and 1991 Brood Year Chinook Salmon

<u>Month</u>	<u>Release site</u>	<u>Fingerlings</u>	<u>Advanced fingerlings</u>	<u>Average size/lb</u>	<u>Weight (lb)</u>
<u>1990 BY</u>					
July	Benicia		<u>443,100</u>	51	<u>8,700</u>
TOTAL			443,100		8,700
<u>1991 BY</u>					
Jan.	Miller Pk.	414,000		1,200	345
Feb.	Auburn				
	Ravine Cr.	101,612		764	133
Feb.	Coon Cr.	114,600		764	150
Feb.	Miller Pk.	229,200		764	300
March	Dry Cr.	118,400		592	200
March	Bear River	118,400		592	200
March	Cosumnes R.	514,000		490	1,050
March	Garcia Bend	3,098,500		679	4,565
April	Garcia Bend	1,844,990		211	8,765
May	Benicia	2,664,950		79	33,850
June	Benicia	<u> </u>	<u>1,557,000</u>	53	<u>29,500</u>
TOTAL		9,218,652	1,557,000		79,058

WINTER-RUN STEELHEAD MAINTENANCE PROGRAM

History of the 1992 Winter Run

All steelhead entering the holding pond were spawned as winter-run steelhead (Table 3). All fish were examined for marks as they were processed or removed dead from the pond. No marked fish were seen.

TABLE 3. Counts of Winter-Run Steelhead, Nimbus Salmon and Steelhead Hatchery, 1991-92.

Date	<u>Spawned and released</u>		<u>Pre-spawning mortality</u>		<u>Released unspawned</u>		Total
	M	F	M	F	M	F	
12/30/91	84	66	8	4	49	20	231
1/6/92	68	54	16	14	36	9	197
1/13/92	69	63	4	11	42	14	203
1/21/92	41	47	14	6	21	5	134
1/27/92	53	49	0	2	14	13	131
2/3/92	36	32	51	30	27	13	189
2/10/92	34	52	2	4	15	3	110
2/18/92	38	39	4	3	18	13	115
2/24/92	16	16	2	0	4	3	41
3/2/92	<u>4</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>15</u>	<u>6</u>	<u>31</u>
TOTAL:	443	424	101	74	241	99	1,382

Spawning Data 1992 Brood Year

The 424 females spawned produced 2,492,425 eggs, for an average of 5,878 eggs per female. Survival of green eggs to eyed eggs ranged from 0% to 84%, with an average of 64%.

Winter-run Steelhead Planted

1991 Brood Year

From January 7, 1992 through February 19, 1992, a total of 377,810 yearling steelhead was planted (Table 4). No tagged fish were released this year.

TABLE 4. Planting and Transfer Data, 1991 Brood Year Winter-run Steelhead, Nimbus Salmon and Steelhead Hatchery, 1991-92.

Month	Release site	Planted		
		Number of yearlings	Average size/lb	Weight (lb)
Jan.	Clarksburg	78,070	3.3	23,800
Jan.	Garcia bend	142,240	3.3	42,900
Feb.	Clarksburg	62,100	4.1	15,000
Feb.	Garcia Bend	<u>95,400</u>	4.2	<u>22,800</u>
TOTALS		377,810		104,500

1992 Brood Year

No fingerlings were released into the American River at the foot of the ladder; a total of 1,231,761 fingerlings was released in the Calaveras River and the Sacramento River at Garcia Bend (Table 5). On June 30, 1992, approximately 480,000 Nimbus fingerlings were on hand. Approximately 370,000 of these will be released as yearlings in January-February of 1993. No eyed steelhead eggs were transferred.

TABLE 5. Planting Data, 1992 Brood Year, Nimbus Salmon and Steelhead Hatchery, 1991-92.

Month	Release site	Number of fingerlings	Average size/lb	Weight (lb)
March	Garcia Bend	134,091	1,000	141
March	Calaveras R.	417,700	1,247	335
April	Calaveras R.	101,100	674	150
April	Garcia Bend	503,390	896	562
June	Garcia Bend	<u>75,480</u>	<u>55</u>	<u>1,370</u>
TOTALS		1,231,761	3,872	2,558

Steelhead Disease Information

1991 Brood Year

Minor outbreaks of Columnaris were controlled using copper sulfate flushes and Terramycin milled or mixed into the fish food.

APPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data for Nimbus Hatchery, 1991-92.

Week	<u>Chinook salmon</u>		<u>Steelhead trout</u>		Half pounders*
	Adults	Grilse	Males	Females	
Nov. 3-Nov. 9	940	89	0	0	0
Nov. 10-Nov. 16	1,471	138	0	0	0
Nov. 17-Nov. 23	2,507	89	0	0	0
Nov. 24-Nov. 30	996	20	0	0	0
Dec. 1-Dec. 7	732	17	0	0	0
Dec. 8-Dec 14	0	0	0	0	0
Dec. 15-Dec. 21	123	6	0	0	0
Dec. 22-Dec. 28	0	0	0	0	0
Dec. 29-Jan. 4	0	0	92	70	69
Jan. 5-Jan.11	0	0	84	70	18
Jan. 12-Jan. 18	0	0	73	74	56
Jan. 19-Jan. 25	0	0	57	53	26
Jan. 26-Feb. 1	0	0	53	51	27
Feb. 2-Feb. 8	0	0	87	62	40
Feb. 9-Feb. 15	0	0	36	56	18
Feb. 16-Feb. 22	0	0	42	42	31
Feb. 23-Feb. 29	0	0	18	16	7
Mar. 1-Mar. 7	—	—	<u>19</u>	<u>12</u>	<u>0</u>
TOTALS	6,679	359	561	506	292

*Half pounders = fish \leq 22 in.

APPENDIX TABLE 2. Chinook Salmon Coded-Wire Tag Recoveries.
Preliminary Data, Nimbus Hatchery, 1991-92

<u>CWT</u>	<u>Number recovered</u>	<u>Brood year</u>	<u>Hatchery of origin</u>	<u>Release site</u>
052040	4	88	Coleman NFH	Benicia
0601110110	1	88	Feather R.	Jersey Point
0601140101	1	88	Feather R.	Steambt Slough
0601140104	2	88	Feather R.	Port Chicago
063101	2	87	Feather R.	Ryde
063103	3	87	Feather R.	Ryde
063111	1	88	Feather R.	Courtland
063115	1	88	Feather R.	Miller Park
064658	1	85	Merced R.	Dos Reis Road
064831	1	88	Mokelumne R.	Berkeley
064832	1	88	Mokelumne R.	Berkeley
065409	21	87	Nimbus	Benicia
065410	7	87	Nimbus	Benicia
065411	5	87	Nimbus	Benicia
065412	35	88	Nimbus	Benicia
065413	52	88	Nimbus	Benicia
065414	70	88	Nimbus	Benicia
065415	33	88	Nimbus	Benicia
065418	1	89	Nimbus	Benicia
066259	1	87	Feather R.	Courtland
066260	1	87	Feather R.	Courtland
066261	1	87	Feather R.	Miller Park
100000*	58			
200000**	1			
400000***	1			
B50205	1	86	Tehama-Colusa	Benicia
B61404	2	87	Feather R.	Courtland
B61406	1	87	Feather R.	Miller Park
B61407	1	87	Feather R.	Miller Park
B61409	1	88	Merced River	Knights Ferry
B61411	1	88	Merced River	Stanislaus R.

*No Tag
 **Tag Lost
 ***Could Not Read Tag

APPENDIX TABLE 3. Summary of Fish Runs to Nimbus Salmon and Steelhead Hatchery

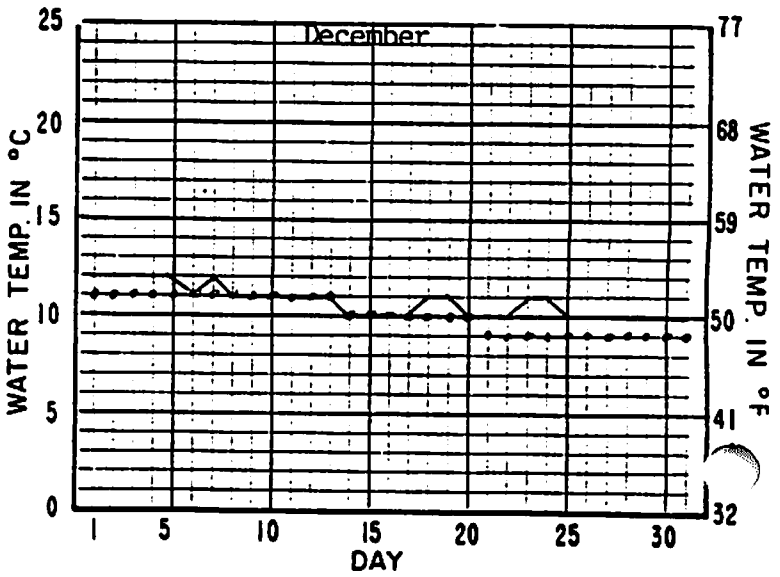
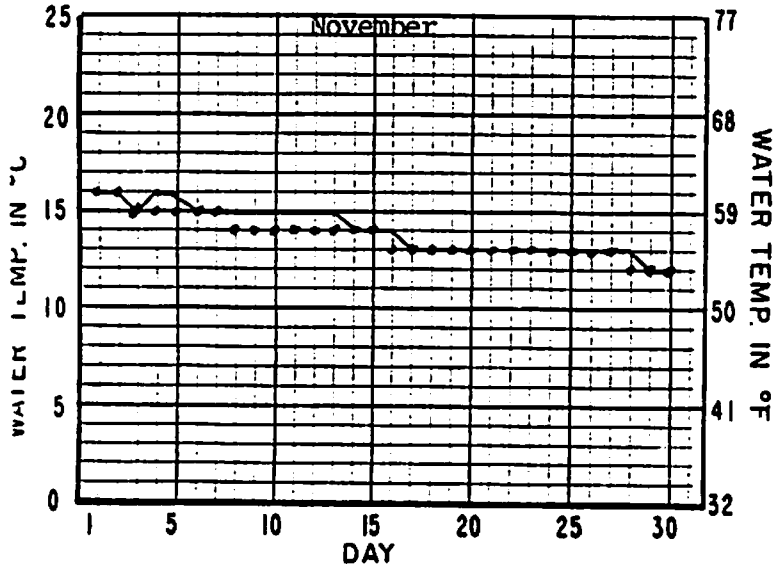
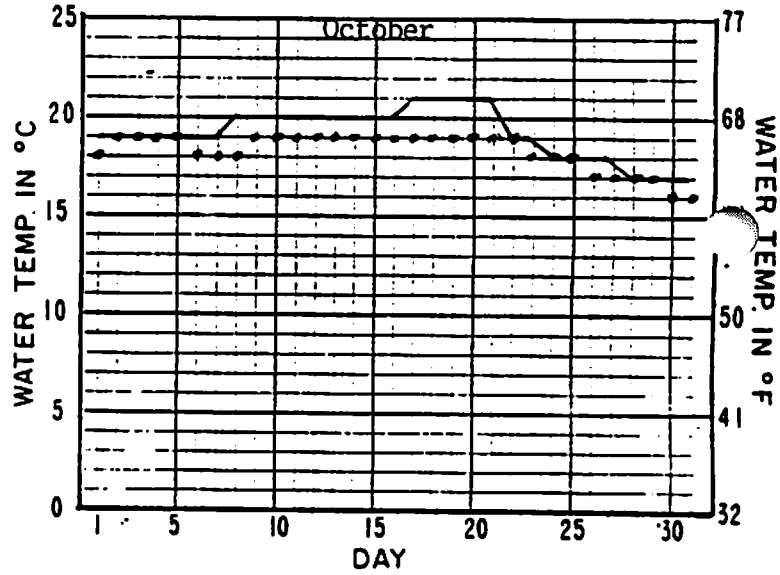
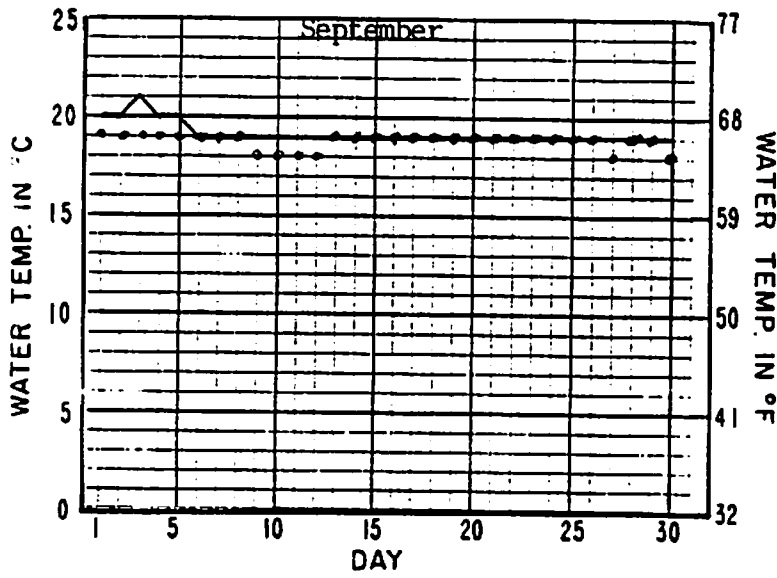
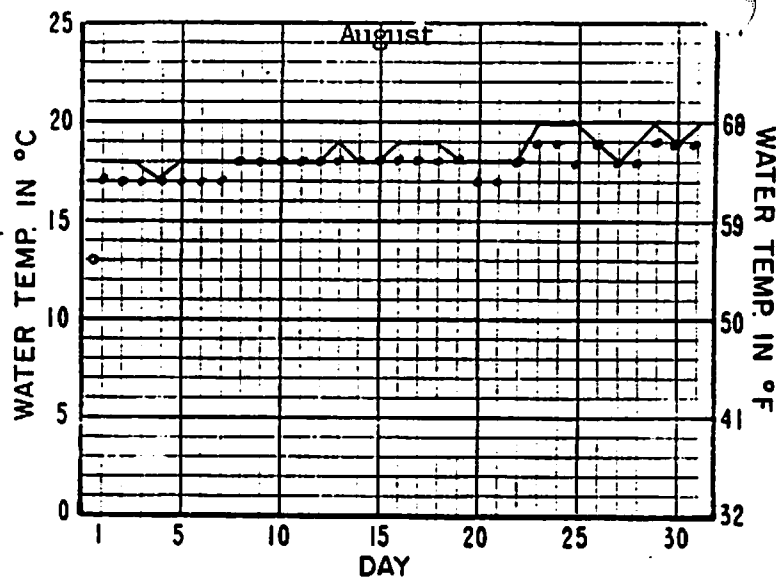
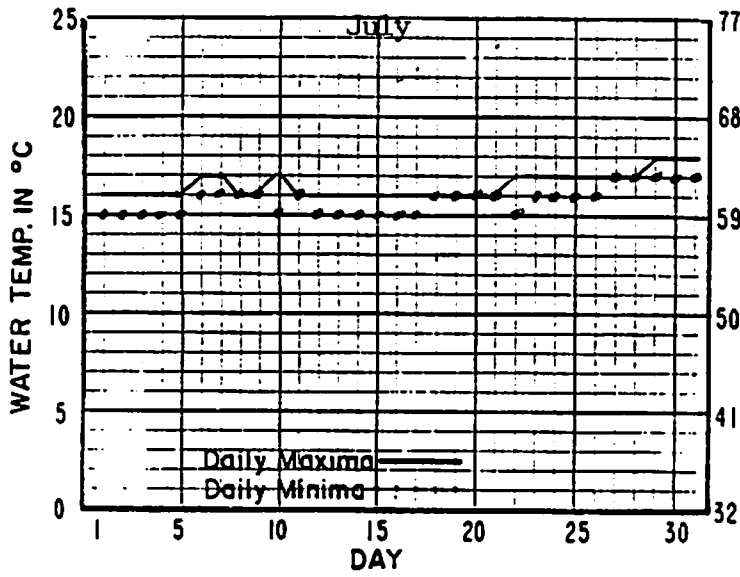
<u>Year</u>	<u>Chinook Salmon</u>			<u>Steelhead</u>
	<u>Males</u>	<u>Females</u>	<u>Grilse</u>	
1955-56	4,427	3,012	*	110
1956-57	267	502	774	115
1957-58	297	341	252	51
1958-59	2,655	638	1,538	102
1959-60	3,003	7,366	2,866	778
1960-61	13,455	6,487	9,331	316
1961-62	3,446	9,257	1,638	137
1962-63	5,088	4,138	3,442	2,141
1963-64	1,213	1,215	813	1,216
1964-65	7,209	8,799	4,534	778
1965-66	5,295	7,595	786	874
1966-67	2,434	5,098	573	642
1967-68	2,022	2,392	733	1,183
1968-69	1,318	2,740	1,175	2,449
1969-70	1,488	1,061	521	1,733
1970-71	3,027	4,827	770	3,033
1971-72	3,384	4,493	1,269	2,256
1972-73	2,195	3,252	1,659	2,506
1973-74	5,155	5,704	1,676	3,157
1974-75	2,762	4,746	671	2,295
1975-76	2,734	3,833	846	2,262
1976-77	2,002	2,340	894	1,307
1977-78	3,496	2,874	498	619
1978-79	2,348	3,767	2,047	680
1979-80	4,779	2,394	3,067	1,310
1980-81	6,122	7,553	2,068	836
1981-82	10,497	7,286	2,805	3,190
1982-83	4,535	3,813	2,576	1,003
1983-84	3,081	3,486	2,514	5,155
1984-85	4,548	5,748	1,953	910
1985-86	3,349	4,439	1,305	1,193
1986-87	2,168	2,617	910	1,431
1987-88	1,759	1,586	2,913	705
1988-89	3,777	4,187	661	289
1989-90	4,105	5,125	511	594
1990-91	1,773	2,251	823	223
1991-92	3,245	3,524	359	1,359 **

* Included in adult male

** Includes 292 half-pounders

DAILY WATER TEMPERATURES BY MONTH

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DAILY WATER TEMPERATURES BY MONTH

-11-

