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ANNUAL REPORT  
NIMBUS SALMON AND STEELHEAD HATCHERY, 1988-89

by

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Inland Fisheries  
Region 2

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Administrative Report No. 90-7

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ABSTRACT

This report describes the operation of Nimbus Salmon and Steelhead Hatchery from July 1, 1988 through June 30, 1989. Tables present numbers of fish trapped, eggs taken, fish reared and released, and water temperatures. There were 8,625 chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 14,974,915 eggs. There were 289 winter-run steelhead, O. mykiss, trapped from which 942,965 eggs were taken.

During the year we planted or transferred a total of 5,042,749 fingerling and 2,370,217 advanced fingerling chinook salmon and 463,815 fingerling and 510,205 yearling steelhead.

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Submitted September 1989. Edited by K.A. Hashagen,  
California Department of Fish and Game, 1416 Ninth Street,  
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INTRODUCTION

This is the 34th 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 1988-89, with particular reference to numbers of fish trapped, spawned and released, eggs taken and fish produced, and other pertinent information.

PRODUCTION SUMMARY

During 1988-89, we took 15,917,880 eggs and planted or transferred 8,387,040 chinook salmon and steelhead, and 170,100 steelhead eggs (Table 1).

TABLE 1. Production Summary, Nimbus Salmon and Steelhead Hatchery, 1988-89

Species	Eggs taken or received	Eggs or fish transferred	Fingerlings planted	Advanced fingerlings or Yearlings planted	Total weight planted(lb)
<u>Chinook salmon</u>					
1988 BY				580,700	10,800
1989 BY	<u>15,866,498</u>		<u>5,042,749</u>	<u>1,789,517</u>	<u>43,704</u>
TOTAL	15,866,498		5,042,749	2,370,217	54,504
<u>Steelhead</u>					
1988			18,800	510,205	109,965
1989	<u>1,500,565</u>	<u>170,100</u>	<u>445,015</u>		<u>421</u>
TOTAL	1,500,565	170,100	463,815	510,205	110,386

HATCHERY OPERATIONS

The weir was installed September 21, 1988, by the Bureau of Reclamation. The weir pickets were lowered and capped on

October 12, 1988. The lower gate in the ladder was removed and the holding pond was opened November 14, 1988. Water temperature was 61°F.

#### Water Temperature Control

Because of low lake level, shutters #1 to #9 were not installed this year. Water temperature in Nimbus holding ponds was 61°F on November 14, 1989.

#### Disposal of Salmon Carcasses

Edible carcasses were given to State and County institutions, community action groups, and groups or councils representing the quality and all inedible carcasses went to a local rendering plant. The total dispensed was 57,100 lb edible, 800 lb animal food, and 61,900 lb inedible.

#### Public Relations

An estimated 442,900 persons 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 75,000 visitors.

#### CHINOOK SALMON MAINTENANCE PROGRAM Chinook Salmon Counts

The fish ladder was opened November 14, 1989, and the first spawning took place on November 15, 1989. A total of 8,625 salmon entered the holding pond this season, including 3,777 males, 4,187 females, and 661 grilse. Grilse are fish 60 cm (23.6 inches) FL or under (Appendix Table 1). A total of 2,927 carcasses was removed from the weir: 1,472 males, 1,272 females, and 183 male and female grilse.

#### Sorting and Spawning

Of the females counted, 2,968 were spawned, 1,053 died in the pond, and 166 were accidentally killed or released. The spawning season, which began November 15, 1988, and ended January 6, 1989, produced a total of 14,974,915 eggs, for an average of 5,045 eggs per female. Fertility, as determined by the difference between green eggs taken and the total eggs eyed, ranged from 46% to 85%, with an average of 65.4%. As insurance against poor egg quality due to warm water, 891,583 eyed chinook salmon eggs were received from Feather River Hatchery in November 1988 (Table 1).

### 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 by the District Biologist (see Appendix Table 2 for tag recovery results).

### Chinook Salmon Planting

#### 1987 Brood Year

There was an estimated 580,700 chinook salmon on hand July 1, 1988.

#### 1988 Brood Year CHIN-N

We released 7,412,966 fingerlings and advanced fingerlings (Table 2). A total of 188,580 of the fish released were coded-wire tagged. on June 30, 1989 there were approximately 2,629,870 chinook salmon on hand to be released in July 1989.

TABLE 2. Planting Data for 1987 and 1988 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>1987 BY</u>					
July	Benicia		398,500	54	7,400
July	Mare Island		182,200	54	3,400
TOTAL:			580,700		10,800

TABLE 2. (continued)

Month	Release site	Fingerlings	Advanced fingerlings	Average size/lb	Weight (lb)
<u>1988 BY</u>					
Jan.	Suisun	815,200	FR*	1,366	600
Feb.	Discovery Park	170,752	N	1,472	116
Feb.	Garcia Bend	1,083,740	N	1,510	718
Feb.	Miller Park	529,250	N	1,450	365
March	Discovery Park	682,020	N	1,450	470
March	Miller Park	1,662,387	N	1,350	1,250
June	Garcia Bend	99,400	N	742	700
June	Benicia		1,789,517	N 45	39,530
TOTAL		5,042,749			43,704

\*FR = Feather River Hatchery  
 N = Nimbus Hatchery

WINTER-RUN STEELHEAD MAINTENANCE PROGRAM  
 History of the 1987 Winter-Run

All steelhead entering the holding pond were spawned as late-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, 1988-89

Date	<u>Spawned and released</u>		<u>Pre-spawning mortality</u>		<u>Released spawned</u>	
	M	F	M	F	M	F
Nov. 18				2		
Nov. 19				1		
Dec. 25			2			
Dec. 30			1	2		
Jan. 2	20	19				
Jan. 6			1	2		
Jan. 9	26	24				
Jan. 17	13	28				
Jan. 23	9	15				
Jan. 30	16	20		3		
Feb. 7	20	20				
Feb. 14	14	13				
Feb. 28	11	7				
	—	—	—	—		
TOTAL	129	146	4	10	0	0

Spawning Data 1988 Brood Year

The 146 females spawned produced 942,965 eggs for an average of 6,459 eggs per female. Survival of green eggs to eyed eggs ranged from 25% to 88%, with an average of 69%. A total of 557,600 eyed late-run steelhead eggs were received in February 1988 from Mad River Hatchery.

Winter-run Steelhead Planted

1988 Brood Year

From August 1988 through February 1989, a total of 18,800 fingerling and 510,205 yearling steelhead was planted (Table 4). No tagged fish were released this year.

TABLE 4. Planting and Transfer Data, 1988 Brood Year Winter-run Steelhead Nimbus Salmon and Steelhead Hatchery, 1988-89

Month	Release site	Number of fingerlings	Number of yearlings	Average size/lb	Weight (lb)
August	Garcia Bend	18,800		40	470
October	Garcia Bend		68,400	16	4,165
January	Benicia		295,335	4	72,930
February	Benicia		146,470	4.5	32,400

Transferred

1989 Brood Year

Prior to June 30, 1989, there were 445,015 fingerlings released into the Sacramento River at Discovery Park (Table 5). On July 1, 1989, approximately 500,000 Mad River and 301,000 Nimbus fingerlings were on hand; approximately 430,000 will be released in January 1990. Approximately 170,000 eyed steelhead eggs (1989 BY) were transferred to Mokelumne River Fish Installation in February 1989.

TABLE 5. Planting Data, 1989 Brood Year Nimbus Salmon and Steelhead Hatchery, 1988-89

Month	Release site	Number of fingerlings	Average size lb	Month (lb)
April	Discovery Park	310,395 N*	862	360
April	Discovery Park	134,620 MR	2,195	61
<b>TOTAL</b>		<b>445,015</b>		<b>421</b>

\* N = Nimbus Hatchery  
MR = Mokelumne River Hatchery

Steelhead Disease Information

1988 Brood Year

Due to high water temperatures using Copper Sulfate, Terramycin, and Formalin were needed to control Columnaris, Gill Bacteria, and "ICH" from May through October.



APPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data for Nimbus Hatchery, 1988-89

<u>Week</u>	<u>Chinook salmon</u>		<u>Steelhead trout</u>		<u>Half-pounders</u>
	<u>Adults</u>	<u>Grilse</u>	<u>Males</u>	<u>Females</u>	
Nov. 13-Nov. 19	1,624	218		2	
Nov. 20-Nov. 27	2,080	214			
Nov. 28-Dec. 3	2,454	155			
Dec. 4-Dec. 10	922	73			
Dec. 11-Dec. 17	819	-0-			
Dec. 18-Dec. 24	41	-0-		1	
Dec. 25-Dec. 31	20	1	3	2	
Jan. 1-Jan. 7	4		21	21	
Jan. 8-Jan. 14			26	24	
Jan. 15-Jan. 21			13	28	
Jan. 22-Jan. 28			9	15	
Jan. 29-Feb. 4			16	23	
Feb. 5-Feb. 11			20	20	7
Feb. 12-Feb. 18			14	13	
Feb. 19-Feb. 25			11	7	
TOTAL	<u>7,964</u>	<u>661</u>	<u>133</u>	<u>156</u>	<u>7</u>

APPENDIX TABLE 2. Chinook Salmon Coded-Wire Tag Recoveries  
Preliminary Data Nimbus Hatchery, 1988-89

CWT Code	Number recovered	Brood year	Hatchery	Release site
06-46-45	1	85	Merced River	Stanislaus River
06-46-49	1	85	Merced River	Stanislaus River
06-46-58	1	85	Merced River	San Joaquin River below Old River
06-46-59 Stewart Road	3	85	Merced River	Old River,
06-48-25	1	85	Mokelumne	Benicia, Carquinez Strait
06-48-30	1	86	Mokelumne	Benicia, Rodeo, Mare
06-54-05	19	85	Nimbus	SF Bay, Berkeley
06-54-06	16	85	Nimbus	Benicia, Carquinez Strait
06-54-07	1	86	Nimbus	SF Bay, Berkeley
06-54-50	1	83	Nimbus	SF Bay, Berkeley
06-54-53	1	84	Nimbus	SF Bay, Berkeley
06-54-54	1	84	Nimbus	Vallejo, Carquinez Strait
06-62-34	1	84	Feather River	SF, Mokelumne River
06-62-35	1	84	Feather River	Sacramento, River Ryde
06-62-46	1	85	Feather River	SF, Mokelumne River
06-62-47	1	85	Feather River	NF, Mokelumne River
06-62-48	3	85	Feather River	Sacramento River, Ryde
06-62-51	1	85	Feather River	Port Chicago, Delta
10-00-00	24		No CWT in head	
40-00-00	5		Unreadable	
B6-11-02	1	84	Merced River	Old River, Stewart Road
H6-06-05	1	85	Coleman	Sacramento R., Red Bluff
H6-06-06	2	84	Wild	S Powel & Redwood Cr.

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

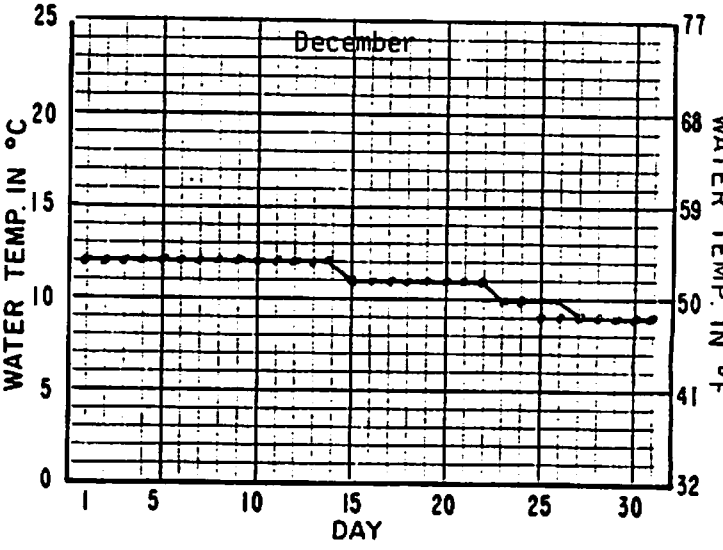
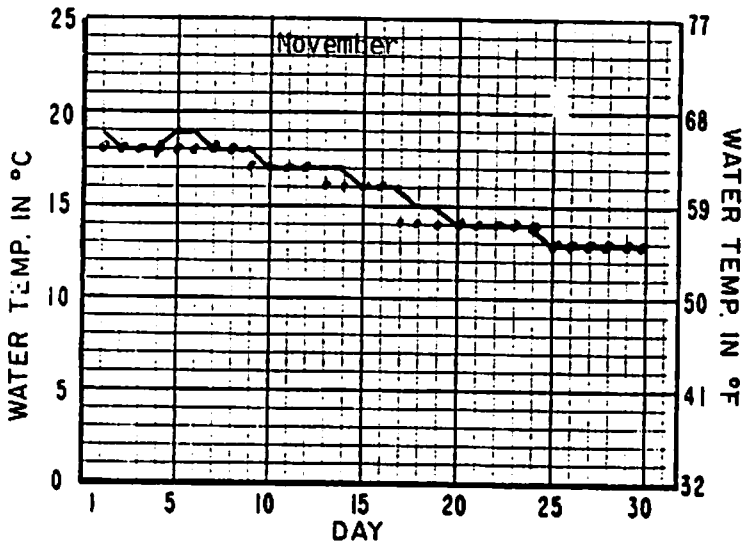
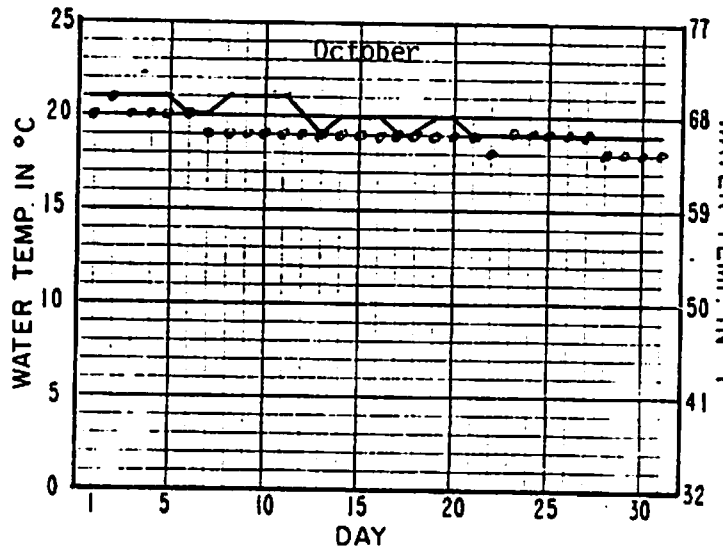
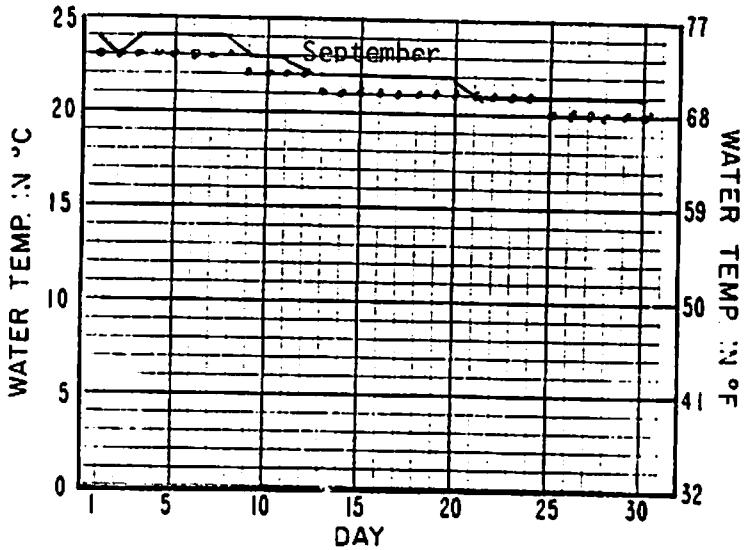
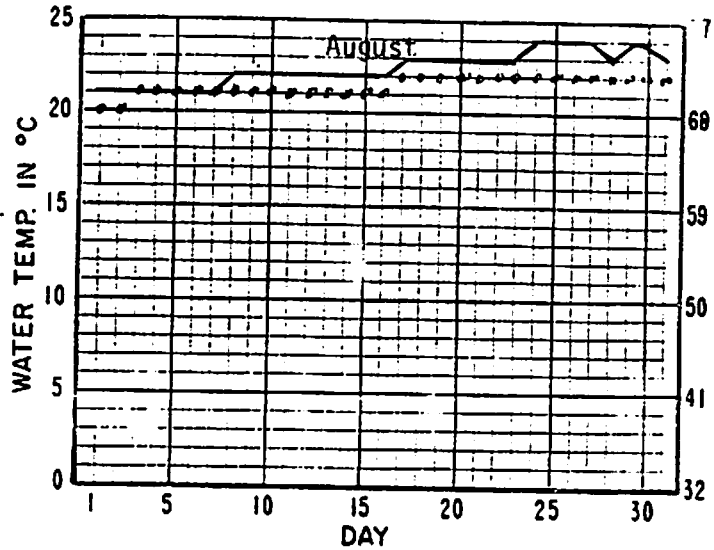
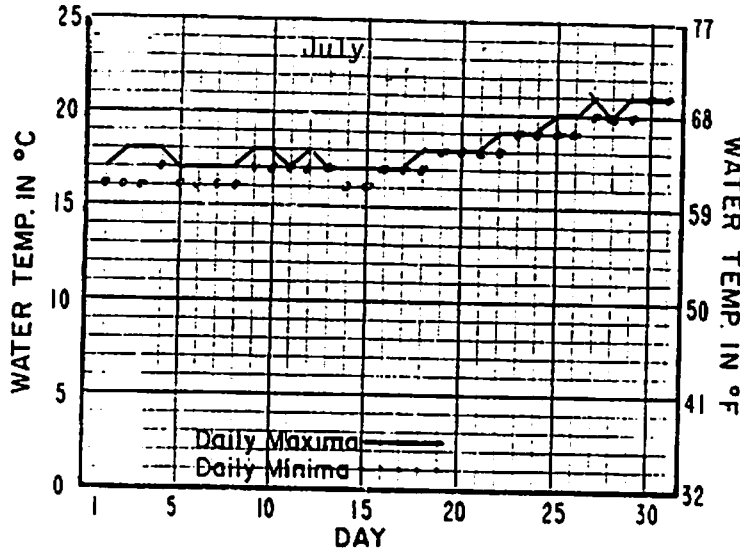
<u>Year</u>	<u>Chinook salmon</u>		<u>Grilse</u>	<u>Steelhead</u>
	<u>Males</u>	<u>Females</u>		
1955-56	4,427	3,012	*	110
1956-57	267	502	774	115
1957-58	297	341	252	51
1958-59	2,655	638	1,538	102
1959-60	3,003	7,366	2,866	778
1960-61	13,455	6,487	9,331	316
1961-62	3,446	9,257	1,638	137
1962-63	5,088	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	2,062	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

\* Included in adult male

Appendix Figure 1. Daily Water Temperatures for Nimbus Salmon and Steelhead Hatchery from July 1, 1988 through June 30, 1989

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DAILY WATER TEMPERATURES BY MONTH



### DAILY WATER TEMPERATURES BY MONTH

