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ANNUAL REPORT
NIMBUS SALMON AND STEELHEAD HATCHERY, 1986-87

by

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Inland Fisheries
Region 2

Inland Fisheries
Administrative Report No. 87-20
1987

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ABSTRACT

This report describes the operation of Nimbus Salmon and Steelhead Hatchery from July 1, 1986 through June 30, 1987. Tables present numbers of fish trapped, eggs taken, fish reared and released, and water temperatures. There were 5,695 chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 11,938,190 eggs. There were 1,431 winter-run steelhead, Salmo gairdneri, trapped from which 1,482,880 eggs were taken.

During the year we planted or transferred a total of 3,167,680 fingerling and 4,757,645 advanced fingerling chinook salmon and 485,208 fingerling and 447,545 yearling steelhead.

INTRODUCTION

This is the 32nd 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 1986-87, with particular reference to numbers of fish trapped, spawned and released, eggs taken and fish produced, and other pertinent information.

PRODUCTION SUMMARY

During 1986-87, we took 13,421,070 eggs and planted or transferred 8,858,078 chinook salmon and 248,750 steelhead eggs (Table 1).

TABLE 1. Production Summary, Nimbus Salmon and Steelhead Hatchery, 1986-87

Species	Eggs taken or received	Eggs or fish transferred	Fingerlings planted	Advanced fingerling or yearlings planted	Total weight planted(lb)
<u>Chinook salmon</u>					
1985 BY				1,717,270	49,550
1986 BY	11,938,190		3,167,680	3,040,375	80,695
<u>Steelhead</u>					
1987	1,482,880	248,750	485,208	447,545	145,867

HATCHERY OPERATIONS

The weir was installed September 30, 1986, by the Bureau of Reclamation. The weir pickets were lowered and capped on October 1, 1986. The lower gate in the ladder was removed and the holding pond was opened November 3, 1986. Water temperature was 62°F.

Water Temperature Control

Shutters #8 and #9 were pulled July 11, 1986, when hatchery water temperature reached 63°F. Shutters #1-#7 were removed on October 28, 1986. Water temperature in Nimbus holding ponds was in the 64°F range. On October 30, 1986 pond temperature had lowered to a constant 62°F.

Disposal of Salmon Carcasses

Edible carcasses were given to State and County institutions, community action groups, and groups or councils representing the local Indians. Local zoos received carcasses of questionable quality and all inedible carcasses went to a local rendering plant. The total dispensed was 39,860 lb edible, 300 lb animal food, and 19,000 lb inedible.

Public Relations

An estimated 328,095 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 73,176 visitors.

CHINOOK SALMON MAINTENANCE PROGRAM Chinook Salmon Counts

The fish ladder was opened November 3, 1986, and the first spawning took place on November 4, 1986. A total of 5,695 salmon entered the holding pond this season, including 2,168 males, 2,617 females, and 910 grilse. Grilse are fish 60 cm (23.6 inches) FL or under (Appendix Table 1). A total of 4,228 carcasses was removed from the weir: 1,042 males, 904 females and 2,282 male and female grilse.

Sorting and Spawning

Of the females counted, 2,154 were spawned, 367 died in the pond, and 96 were accidentally killed or released.

The spawning season, which began November 4, 1986, and ended December 1, 1986, produced a total of 11,938,190 eggs, for an average of 5,542 eggs per female. Fertility, as determined by the difference between green eggs taken and the total eggs eyed, ranged from 31.5% to 78.5%, with an average of 66.95%.

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

1985 Brood Year

There was an estimated 1,717,270 chinook salmon on hand July 1, 1986.

1986 Brood Year KS-N

We released 7,925,325 fingerlings and advanced fingerlings (Table 2). 113,520 of the fish released were coded-wire tagged. On June 30, 1987 there were approximately 373,150 chinook salmon on hand to be released in July 1987.

TABLE 2. Planting Data for 1985 and 1986 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>1985 BY</u>					
July	Benicia		1,717,270	34.7	49,550
<u>1984 BY</u>					
Jan.	Foot of Ladder	1,038,000		1,200	865
Jan.	Cosumnes River	216,000		1,200	180
Feb.	Foot of Ladder	647,480		1,012	640
Apr.	Sacramento River Discovery Park	401,600		108	3,725
May	Benicia	492,000	818,975	64	20,525
June	Benicia	372,600	2,221,400	47	54,760
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Totals		3,167,680	4,757,645		130,245

WINTER-RUN STEELHEAD MAINTENANCE PROGRAM
History of the 1986 Winter-Run

All steelhead entering the holding pond were spawned as late-run steelhead. All fish were examined for marks as they were processed or removed dead from the pond. Heads were removed from all adipose fin-clipped fish for recovery of coded-wire tags by the District Biologist. No coded-wire tags were recovered.

TABLE 3. Counts of Winter-Run Steelhead
Nimbus Salmon and Steelhead Hatchery, 1986-87

Date	<u>Spawned and released</u>		<u>Pre-spawning mortality</u>		<u>Released unspawned</u>		Total
	M	F	M	F	M	F	
12-5					177	148	325
1-6	153	144	28	19	176	141	661
2-6	95	73	2	1	119	155	445
Totals	248	217	30	20	472	444	1,431

Spawning Data 1987 Brood Year

The 217 females spawned produced 1,482,880 eggs for an average of 6,834 eggs per female. Survival of green eggs to eyed eggs ranged from 86.6% to 92.6%, with an average of 89.6%.

Winter-run Steelhead Planted

1986 Brood Year

From October 30, 1986, through February 10, 1987, a total of 447,545 yearling steelhead was planted (Table 4). No tagged fish were released this year.

TABLE 4. Planting Data, 1986 Brood Year Winter-run Steelhead,
Nimbus Salmon and Steelhead Hatchery, 1986-87

Month	Release site	Number of yearlings	Average size/lb	Weight (lb)
October	Garcia Bend	28,320	5.9	4,800
January	Benicia	272,145	2.8	98,300
February	Benicia	147,080	3.2	42,100
Totals		447,545		145,200

1987 Brood Year

Prior to June 30, 1987, there were 485,208 fingerlings released into the American River at the base of the fish ladder (Table 5). On July 1, 1987, approximately 527,145 Nimbus fingerlings were on hand; approximately 430,000 will be released in January 1988. Approximately 248,750 eyed steelhead eggs (1987 BY) were transferred to Mokelumne River Fish Installation on February 4, 1987.

TABLE 5. Planting Data, 1987 Brood Year
Nimbus Salmon and Steelhead Hatchery, 1987

Month	Release site	Number of fingerlings	Average size/lb	Weight (lb)
March	Foot of Ladder	331,800	840	395
April	Foot of Ladder	153,408	564	272
Totals		485,208		667

Steelhead Disease Information

1986 Brood Year

Four minor outbreaks of Columnaris were controlled by feeding terramycin milled into the feed and drip treatments using Copper Sulfate.

APPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data For Nimbus Hatchery, 1986-87

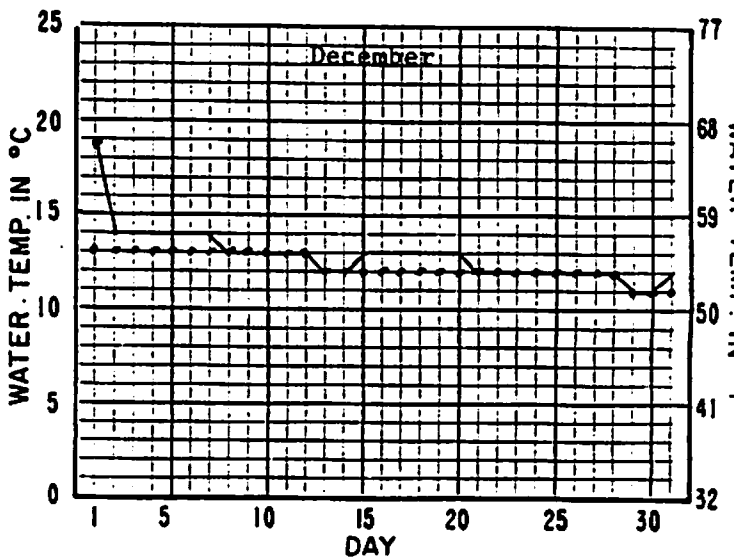
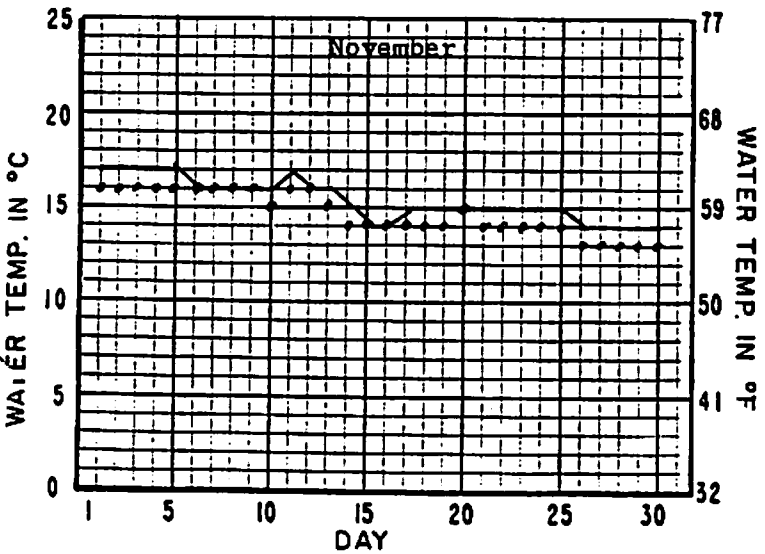
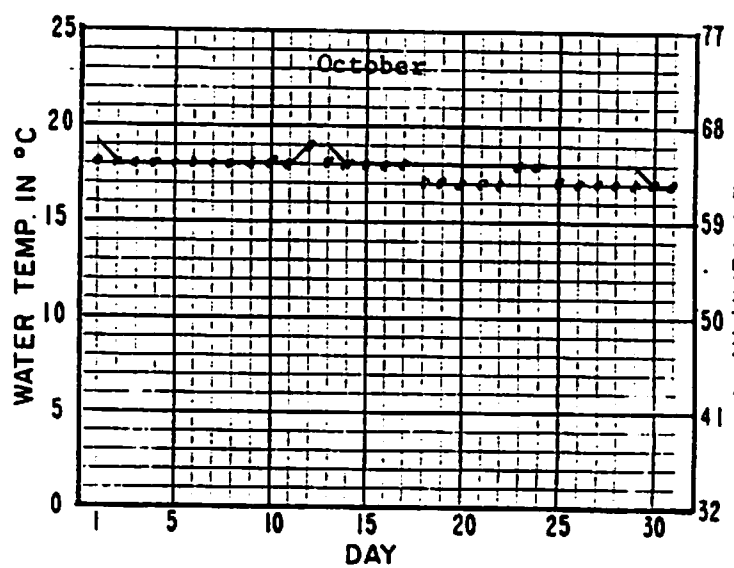
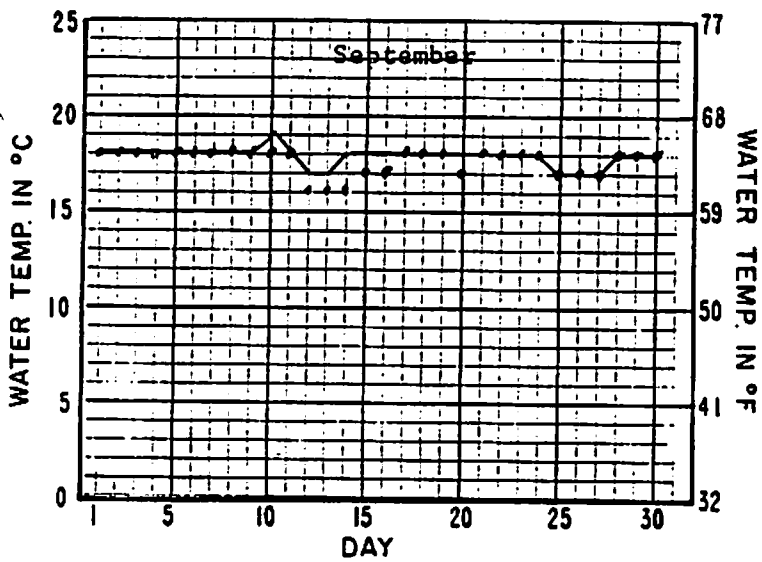
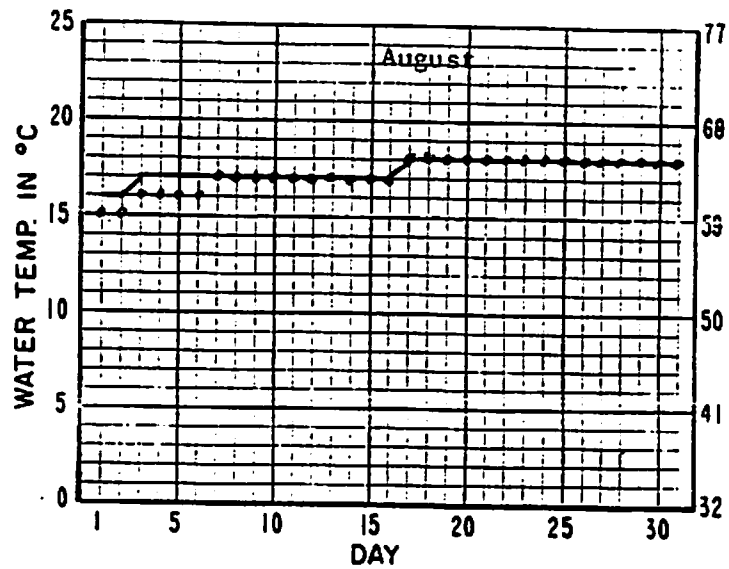
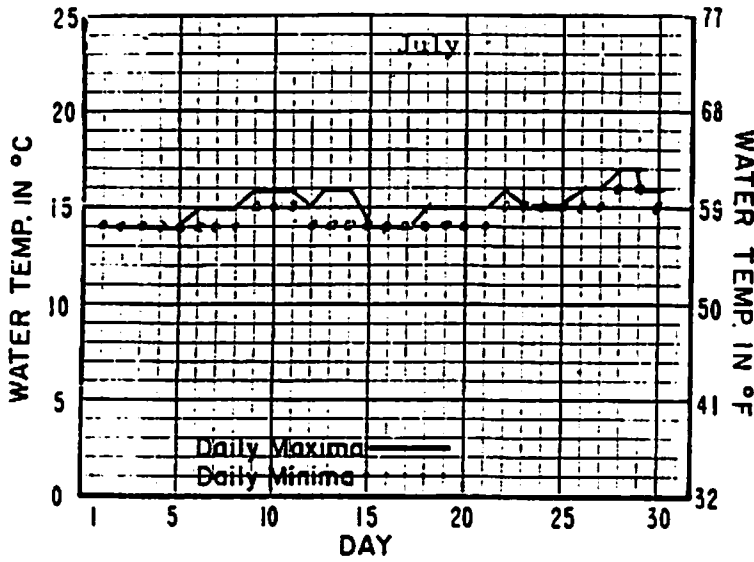
<u>Week</u>	<u>Chinook salmon</u>		<u>Coho salmon</u>		<u>Steelhead trout</u>	
	<u>Adults</u>	<u>Grilse</u>	<u>Adults</u>	<u>Grilse</u>	<u>Males</u>	<u>Females</u>
Nov 2 - Nov 8	1,242	374				
Nov 9 - Nov 15	1,481	365				
Nov 16 - Nov 22	1,115	111				
Nov 23 - Nov 29	682	59				
Nov 30 - Dec 6	263	1			177	148
Dec 7 - Dec 13						
Dec 14 - Dec 20						
Dec 21 - Dec 27						
Dec 28 - Jan 3						
Jan 4 - Jan 10	2				357	304
Jan 11 - Jan 17						
Jan 18 - Jan 24						
Jan 25 - Jan 31						
Feb 1 - Feb 7					216	229
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Season Totals	4,785	910			750	681

APPENDIX TABLE 2. Chinook Salmon Coded-Wire Tag Recoveries
Nimbus Hatchery 1986-87

CWT Code	Number recovered	Brood year	Hatchery	Release site	Release date
06-46-30	1	82	Merced River	Benicia	10-3-83
06-46-33	27	83	Merced River	Benicia	10-17-84
06-46-43	5	84	Merced River	Carquinez Str.	10-15-85
06-48-29	1	84	Mokelumne River	Vallejo	7-29-85
06-54-50	23	83	Nimbus Hatchery	Berkeley	7-24-84
06-54-51	11	83	Nimbus Hatchery	Port Chicago	7-23-84
06-54-52	19	83	Nimbus Hatchery	Fort Baker	7-25-84
06-54-53	6	84	Nimbus Hatchery	Berkeley	7-3-85
06-54-54	1	84	Nimbus Hatchery	Vallejo	7-3-85
06-58-43	1	82	Feather River	Tiburon	11-20-83
06-58-47	1	83	Feather River	Vallejo	6-18-84
06-62-45	1	84	Feather River	Port Chicago	5-13-85
H6-04-06	1	83	Coleman	Koket	3-8-84
10-00-00	8		No Tag		

Appendix Figure 1. Daily Water Temperatures for Nimbus Salmon and Steelhead Hatchery from July 1, 1986 through June 30, 1987.

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

