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ANNUAL REPORT
NIMBUS SALMON AND STEELHEAD HATCHERY, 1992-93

by

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Region 2, Inland Fisheries

Inland Fisheries
Administrative Report No. 94-7

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ABSTRACT

This report describes the operation of Nimbus Salmon and Steelhead Hatchery from July 1, 1992 through June 30, 1993. Tables present numbers of fish trapped, eggs taken, fish reared and released, and water temperatures. There were 6,456 chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 11,496,400 eggs. There were 241 winter-run steelhead, O. mykiss, trapped, from which 541,065 eggs were taken.

During the year, hatchery personnel planted or transferred a total of 7,936,390 fingerling and 177,200 advanced fingerling chinook salmon and 534,830 fingerling, and 37,400 yearling steelhead trout.

Because of drought conditions in the American River drainage, 447,500 yearling steelhead were transferred to Mokelumne River Hatchery. The water was turned off and the Hatchery closed on July 21, 1992.

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Submitted October 1993. Edited by K.A. Hashagen,
California Department of Fish and Game, 1416 Ninth Street,
Sacramento CA 95814

INTRODUCTION

This is the 38th 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 1992-93, with particular reference to numbers of fish trapped, spawned, and released, eggs taken and fish produced, and other pertinent information.

PRODUCTION SUMMARY

During 1992-93, hatchery personnel took 12,037,465 eggs and planted or transferred 8,685,820 chinook salmon and steelhead trout (Table 1).

TABLE 1. Production Summary, Nimbus Salmon and Steelhead Hatchery, 1992-93

Species	Eggs taken or received	Eggs or fish transferred	Fingerlings planted	Advanced fingerlings or yearlings planted	Total weight planted (lb)
<u>CHIN</u>					
1991 BY				177,200	4,900
1992 BY	11,496,400		7,936,390		43,444
<u>SH</u>					
1992 BY		447,500		37,400	16,667
1993 BY	823,765	87,330			570

HATCHERY OPERATIONS

The weir was installed September 29, 1992, by the Bureau of Reclamation. The weir pickets were lowered and capped on October 1, 1992. The lower gate in the ladder was removed and the holding pond was opened November 12, 1992; the water temperature was 59°F. The ladder was closed February 22, 1993.

Water Temperature Control

Shutters 1-7 in Folsom Dam were removed July 8, 1992. On July 8, 1992, the water was shut off to the Hatchery because of low water levels and high water temperature in Folsom Lake.

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 45,800 lb edible and 28,200 lb inedible.

Public Relations

An estimated 141,675 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 31,791 visitors.

CHINOOK SALMON MAINTENANCE PROGRAM

Chinook Salmon Counts

The fish ladder was opened November 12, 1992, and the first spawning took place on November 16, 1992. A total of 6,456 salmon entered the holding pond this season, including 2,458 males, 2,649 females, and 1,349 grilse. Grilse were fish 60 cm (23.6 inches) FL or less (Appendix Table 1). A total of 1,100 carcasses was removed from the weir: 158 males, 242 females, and 700 male and female grilse.

Sorting and Spawning

Of the females counted, 2,142 were spawned, and 507 died in the pond or were released. The spawning season, which began November 16, 1992, and ended December 22, 1992 produced a total of 11,496,400 eggs, for an average of 5,367 eggs per female. Fertility, as determined by the difference between green eggs taken and the total eggs eyed, ranged from 69% to 93%, with an average of 85%.

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

1991 Brood Year

There were 177,200 chinook salmon on hand July 1, 1992.

1992 Brood Year

We released 8,113,590 fingerlings and advanced fingerlings (Table 2). None of the fish released was coded-wire tagged.

On June 30, 1993, there were approximately 2,206,600 chinook salmon (1992 brood year) on hand to be released in July-August 1993.

TABLE 2. Planting Data for 1991 and 1992 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>1991 BY</u>					
July	Benicia		177,200	36	4,900
TOTAL			<u>177,200</u>	<u>36</u>	<u>4,900</u>
<u>1992 BY</u>					
Feb.	Auburn				
	Ravine Cr.	101,190		1,165	86
Feb.	Coon Cr.	100,190		1,165	86
	Dry Cr.	100,190		1,165	86
	Miners				
	Ravine Cr.	50,095		1,165	43
	Cosumnes R.	200,380		1,165	172
	Sacramento				
	River at				
	Miller Pk.	774,860		1,185	654
March	Secret				
	River Cr.	51,660		1,230	42
	Sacramento				
	River at				
	Miller Pk.	2,534,800		996	2,545
April	Sacramento				
	River at				
	Miller Pk.	1,312,550		403	3,255
June	Sacramento				
	River	2,262,200		72	31,700
	Sacramento				
	River at				
	Rio Vista	449,275		94	4,775
TOTAL		<u>7,936,390</u>		<u>183</u>	<u>43,444</u>

WINTER-RUN STEELHEAD MAINTENANCE PROGRAM

History of the 1993 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, 1992-93

Date	<u>Spawned and released</u>		<u>Pre-spawning mortality</u>		<u>Released unspawned</u>		Total
	M	F	M	F	M	F	
1/4/93	12	13	4				29
1/9/93	9	12		1			22
1/19/93	1	2	1	1			5
1/15/93	4	16					20
2/1/93	9	20					29
2/8/93	10	3					13
2/16/93	24	9	2	1			36
2/22/93	15	10			42	20	87
TOTAL	84	85	7	3	42	20	241

Spawning Data, 1993 Brood Year

The 85 females spawned produced 514,065 eggs, for an average of 6,048 eggs per female. Survival of green eggs to eyed eggs ranged from 19% to 93%, with an average of 72%.

Winter-run Steelhead Planted

1992 Brood Year

During July 1992 a total of 484,900 yearling steelhead was planted or transferred.

TABLE 4. Planting and Transfer Data, 1992 Brood Year Winter-run Steelhead, Nimbus Salmon and Steelhead Hatchery, 1992-93

Planted and Transferred

<u>Month</u>	<u>Release site</u>	<u>Number of yearlings</u>	<u>Average size/lb</u>	<u>Weight (lb)</u>
July	Mokelumne R. Hatchery	447,500	28.7	15,567
July	Garcia Bend	37,400	34	1,100
TOTAL		484,900		16,667

1993 Brood Year

No fingerlings were released into the American River at the foot of the ladder. We received 309,334 eyed eggs from Mad River Hatchery. A total of 87,330 Mad River fingerlings was transferred to Mokelumne River Hatchery.

On June 30, 1993, approximately 349,254 Nimbus and 213,080 Mad River fingerlings were on hand. Approximately 430,000 of these will be released as yearlings in January or February of 1994. No eyed steelhead eggs were transferred.

Steelhead Disease Information

1993 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, 1992-93

Week	Chinook salmon		Steelhead trout		Half pounders*
	Adults	Grilse	Males	Females	
Nov. 15-21	594	516			
Nov. 22-28	517	289			
Nov. 29-Dec. 5	1,403	313			
Dec. 6-12	1,320	175			
Dec. 13-19	746	52			
Dec. 20-26	456	4			
Dec. 27-Jan. 2	0	0			
Jan. 3-9	70	0	16	13	0
Jan. 10-16	1	0	9	13	0
Jan. 17-23			2	3	0
Jan. 24-30			4	16	0
Jan. 31-Feb. 6			9	20	0
Feb. 7-13			10	3	0
Feb. 14-20			26	10	0
Feb. 21-27			57	30	0
TOTALS	5,107	1,349	133	108	0

*Half pounders = fish \leq 22 inches

APPENDIX TABLE 2. Chinook Salmon Coded-Wire Tag Recoveries.
Preliminary Data, Nimbus Hatchery, 1992-93

<u>CWT</u>	<u>Number recovered</u>	<u>Brood year</u>	<u>Hatchery of origin</u>	<u>Release site</u>
0601130101	1		unknown	
0601140109	1	1989	Feather	Jersey Point
0601140206	1	1990	Feather	Jersey Point
0631118	1	1989	Feather	Miller Park
064513	1	1990	Merced	LaGrange
064832	1	1988	Mokelumne	Berkeley
064838	1	1990	Mokelumne	Mokelumne R.
064845	1	1990	Mokelumne	Mokelumne R.
065411	1	1987	Nimbus	Benicia
065412	5	1988	Nimbus	Benicia
065413	4	1988	Nimbus	Benicia
065414	6	1988	Nimbus	Benicia
064515	5	1988	Nimbus	Benicia
064518	4	1989	Nimbus	Benicia
064519	2	1989	Nimbus	Benicia
064520	1	1989	Nimbus	Benicia
065412	4	1989	Nimbus	Benicia
100000*	31			

*No Tag

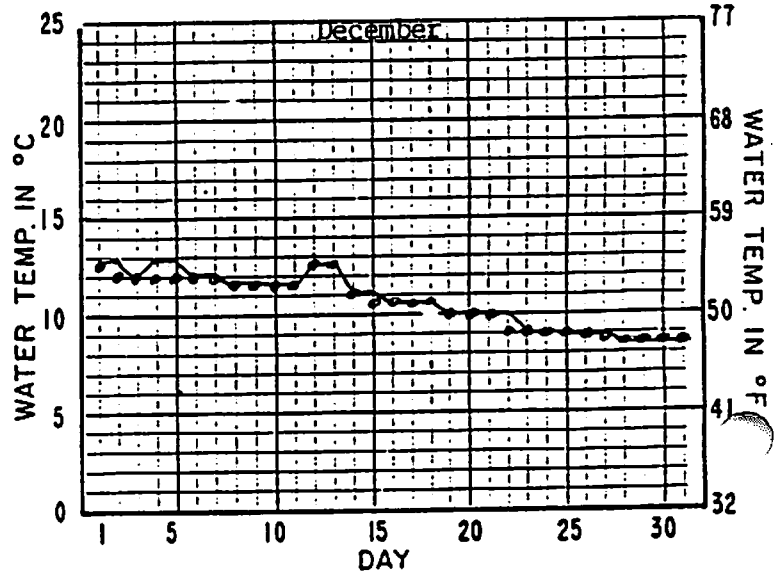
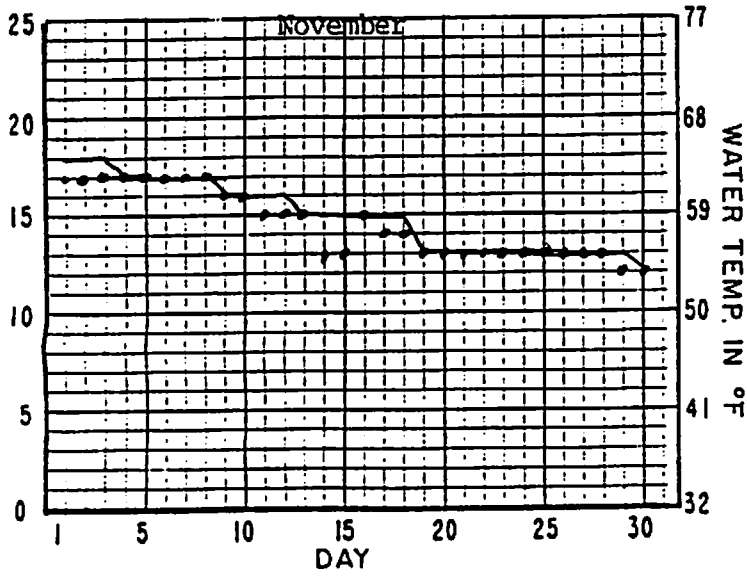
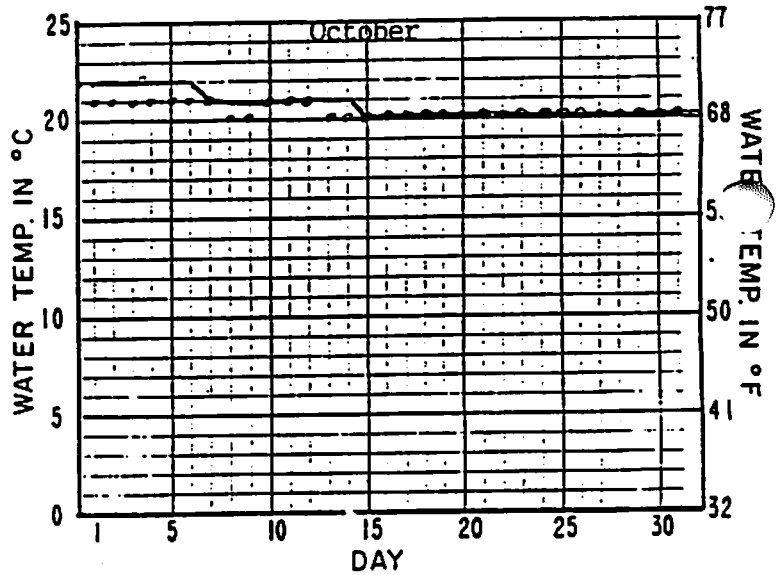
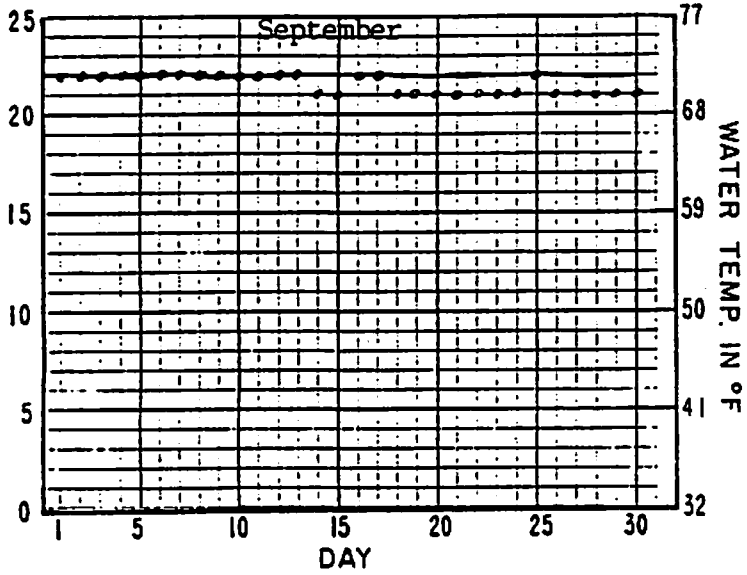
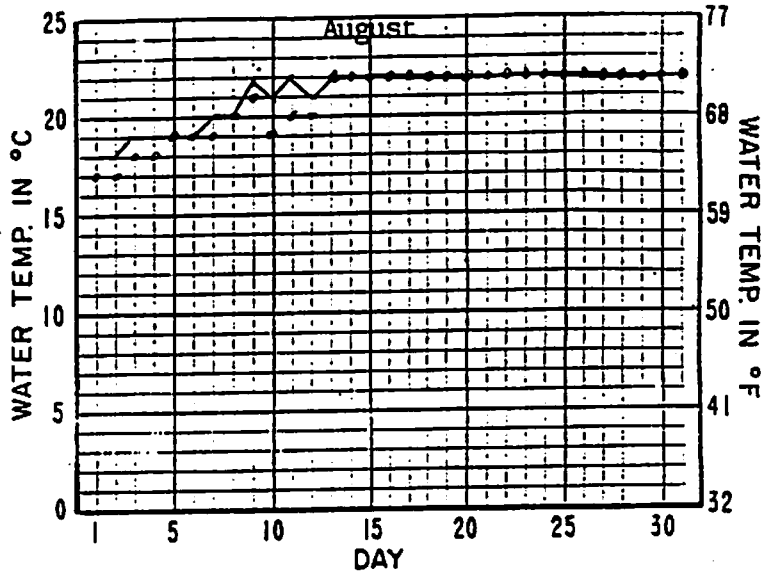
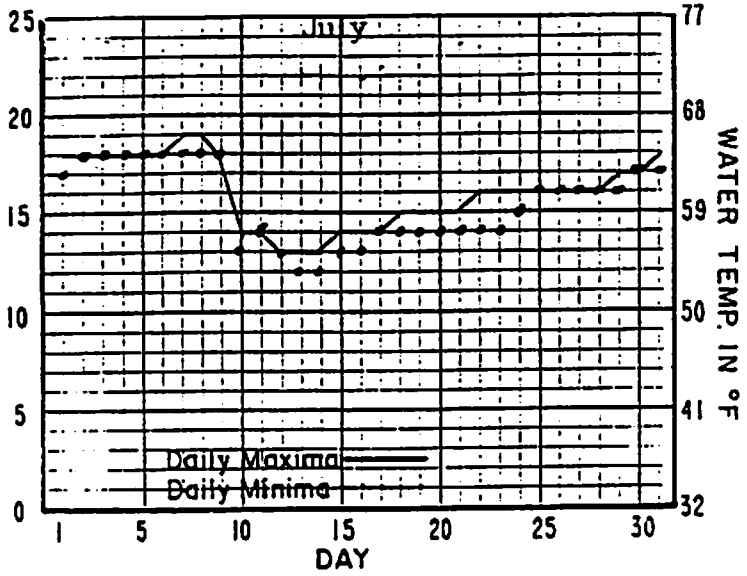
APPENDIX TABLE 3. Summary of Fish Runs to Nimbus Salmon and Steelhead Hatchery

<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
1992-93	2,458	2,649	1,349	241

* Included in adult male

APPENDIX FIGURE 1. Daily Water Temperatures for Nimbus Salmon and Steelhead Hatchery from July 1, 1992 through June 30, 1993

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

