

State of California
The Resources Agency
Department of Fish and Game

ANNUAL REPORT NIMBUS SALMON AND STEELHEAD HATCHERY
1970-71 FISCAL YEAR^{1/}

by

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SUMMARY

The first king salmon (Oncorhynchus tshawytscha) of the 1970 fall migration was observed at the fish weir on September 18. The last salmon was counted in the holding pond on January 7, 1971.

Steelhead (Salmo gairdnerii gairdnerii) entered the holding pond in late October with the early salmon migrants and were counted until February 25, 1971.

Production data are as follows:

Species	Number trapped	Number eggs received	Number fingerlings planted	Number yearlings planted & transferred	Total pounds	On hand 6-30-71
King salmon						
1970 BY	8,624	15,680,500*	11,145,287		38,112	203,850
1969 BY			787,050	34,155	14,690	None
American River steelhead						
1971 BY	3,033	2,423,635**	740,070		971	951,900
1970 BY				673,390	67,483	None
1969 BY				9,280	2,900	None
Summer steelhead						
1971 BY	0	128,561***				128,561
1970 BY				67,445	8,440	None

* Includes 2,334,090 eyed eggs shipped to Feather River Hatchery.

** Includes 251,550 eyed eggs shipped to Mokelumne River Fish Installation.

*** From Roaring River Hatchery, Oregon.

^{1/} Anadromous Fisheries Branch Administrative Report No. 73-6.
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INTRODUCTION

This is the 16th annual report of the Nimbus Salmon and Steelhead Hatchery. The hatchery is operated by the California Department of Fish and Game under contract with the United States Bureau of Reclamation. The report summarizes the activities of the hatchery during fiscal year 1970-71 with particular reference to numbers of fish trapped and spawned, eggs and fish produced, and pertinent weather data.

KING SALMON MAINTENANCE PROGRAM

History of the 1970 Salmon Migration

The fish weir racks were installed by Bureau of Reclamation personnel on August 19, 1970. After some minor repair of the structure below water level was accomplished, and approximately 7 tons of cobbles were placed in various locations where fish escapement was considered a possibility, the weir was deemed operational. During the season some adult escapement through the weir did occur so evidently all holes had not been sealed. The fish weir was removed and stored on December 10 because flows in the river exceeded 7,500 cfs.

The first observation of an adult king salmon below the weir occurred on September 18, 1970, but fish were not allowed to ascend the fish ladder and enter the holding pond until October 21.

A total of 8,624 king salmon migrated to the hatchery and were counted as they were spawned from November 3, 1970, until January 14, 1971. In addition, 3,131 salmon carcasses were removed from the weir. The holding pond count was composed of 3,027 mature males, 4,827 mature females, and 770 grilse. The latter figure includes 15 two-year-old females. Of the carcasses removed from the weir 647 were mature males, 481 were unspawned females, 692 were spent females, and 1,311 were grilse. Carcass recovery was estimated at 80%.

Artificial spawning of king salmon, which occurred from November 3 to December 18, produced 15,680,500 eggs from 2,851 females. The number of green eggs reported taken was established at 5,500 per fish. In addition to the number of females spawned, 1,152 males were used to fertilize the eggs taken; 678 males and 81 females were killed and not spawned; 770 grilse were killed; 489 males and 1,046 females died in the pond before being spawned (see Figure 1).

The number of eggs taken by December 18 exceeded the smolt production capacity of the hatchery so 2,334,090 eyed eggs, 486 males, and 640 females were transported to Feather River Hatchery. The adult fish were released in the spawning channel. There were an additional 190 males and 182 females released in the Yuba River. Also 32 males and 27 females were returned to the American River from the holding pond.

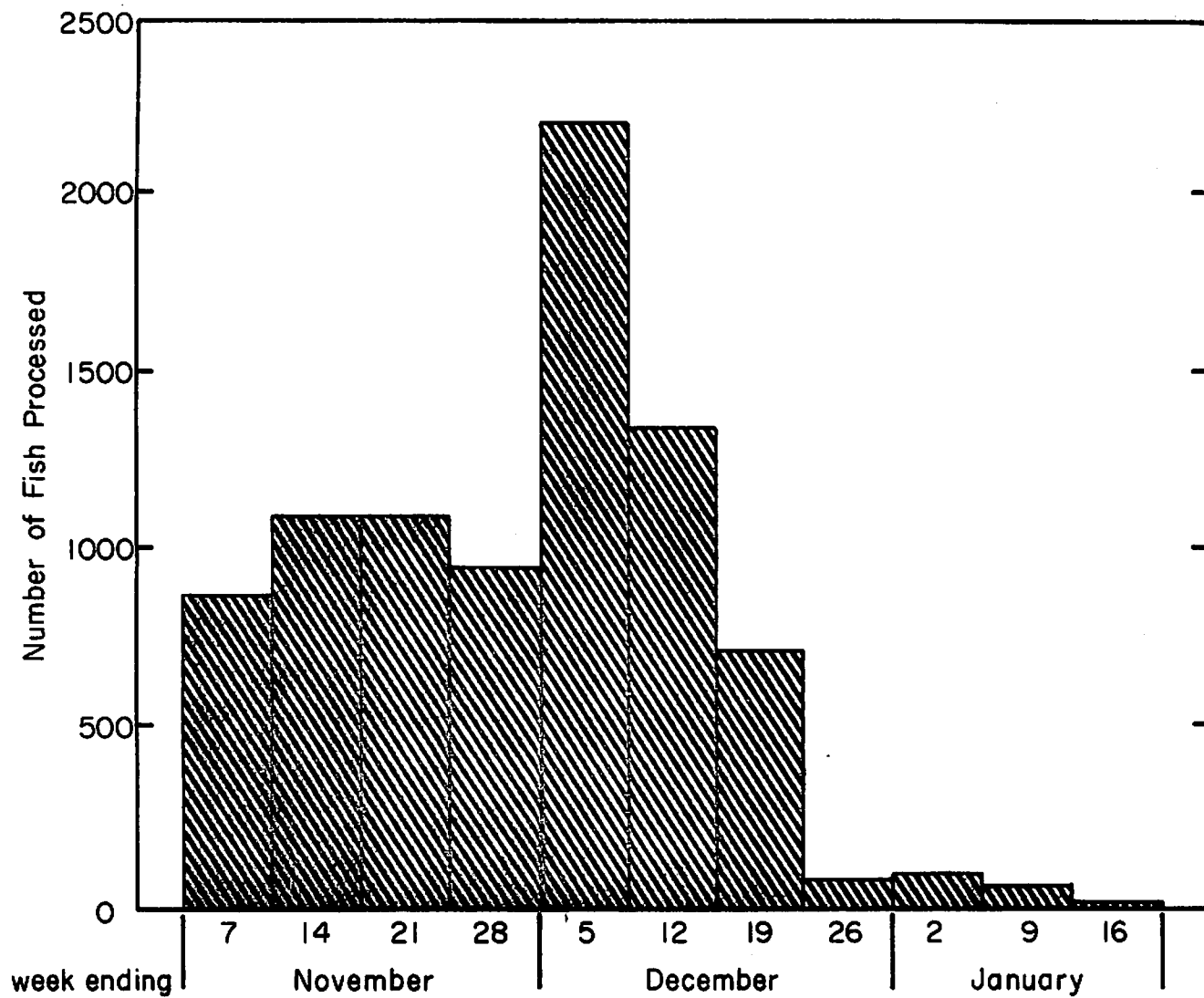


Figure 1. King salmon counts during spawning operations at Nimbus Hatchery 1970-71 season.

Marked King Salmon Returns

There were 44 marked king salmon counted in the holding pond and 12 were recovered from the fish weir. Of the 56 marked king salmon recovered, 32 originated at Nimbus Hatchery. Thirteen were fish released at Rio Vista, but reared at either Feather River or Coleman Hatchery, and one was a marked Sacramento River wild fish. The remaining 10 were of undetermined origin (see Table 1).

Planting 1970 Brood Year King Salmon

Because of limited rearing capacity 8,731,100 of the 1970 brood year king salmon were released at the hatchery smaller than the optimum size of 90/lb. These early-released fish were planted at the hatchery from February 18, to May 4, at sizes ranging from 1,243 to 116 per pound. One group (250,900) was marked Ad; the rest were released unmarked (see following table).

1970 Brood Year Fingerling Releases

Date of release	Range in size	Number released	Average size at release
2-18 to 2-28	1,200 - 1,180/lb	2,056,100	1,188/lb
3- 1 to 3-31	1,243 - 624/lb	4,901,150*	1,026/lb
4- 1 to 4-30	945 - 332/lb	1,105,850	622/lb
5- 1 to 5-24	650 - 116/lb	668,000	272/lb
TOTAL		8,731,000	

* Includes 250,900 1,243/lb swim-ups marked Ad, released 3/12/71.

The remaining 2,414,187 1970 brood year fish planted were released as smolts. They were released at three different locations as part of a program to evaluate release sites. Approximately 1/3 were marked. All 1970 brood year releases were from May 26, to June 12, 1971. Fish ranged in size from 73 to 107/lb (see following table).

1970 Brood Year Smolt Releases

Release site	Marked smolts	Unmarked smolts
Hatchery	258,278 (An-LV)	543,173
Mouth - American River	256,845 (Ad-An-RV)	537,068
Rio Vista - Sacramento R.	257,213 (An-RV)	561,610
TOTALS	772,336	1,641,851

Planting 1969 Brood Year King Salmon

From July 14, through August 14, 1970, 787,050 unmarked smolts were released. Of that number 245,250 were planted in the American River near the hatchery and 541,800 were planted in the Sacramento River at Miller Park. The fish ranged in size from 145 to 50 per pound.

From October 26, 1970, to February 4, 1971, 34,155 unmarked yearlings were planted in the Sacramento River. Of that number 23,325 were released at Miller Park and 10,830 were released near Rio Vista. Planted yearlings ranged in size from 5.7 to 9/lb.

Water Temperature Control

This year "normal water year" procedures were used at Nimbus Dam to control water temperatures in the American River. The number nine shutters were removed on July 29, the number eight shutters were removed on August 24, and the remaining seven shutters were pulled on October 1. No cooling trend could be observed with the removal of either the number nine or number eight shutters, only a stabilization of temperatures prevailing at that time. However, a definite lowering of the water temperature was noted by the afternoon on October 2 following removal of the number seven shutters. Temperature data are detailed in the Appendix of this report. The number seven shutters were installed about January 26, 1971, and the number eight and nine shutters were installed on March 29.

Other Species of Salmon Encountered

During the season three male and two female silver salmon (O. kisutch) were counted in the holding pond.

Disposal of Salmon Carcasses

Approximately 67,390 lb of salmon carcasses were given to various public institutions, charitable organizations and Indians of California. In addition, 3,500 lb were given to local zoos and 15,350 lb were given to a rendering plant.

STEELHEAD MAINTENANCE PROGRAM

At the start of the salmon spawning season 65 adult steelhead were counted and placed in an enclosure in the number one holding pond. This procedure was followed throughout the salmon spawning season, or until December 23 when we counted and moved all (1,326) adult steelhead to the number two holding pond. Daily counts of steelhead were later made as they were processed and released to the river. We clipped the upper lobe of each caudal fin to prevent recounting. The total number of adult steelhead processed was 3,033 (see following table and Appendix).

Counts of Steelhead During Steelhead Spawning Operations

Date	Spawned & released		Released unspawned		Died in pond	
	M	F	M	F	M	F
12- 3-70					4	3
12- 6-70						1
12-15-70					4	3
12-17-70			61	39	2	5
12-23-70					11	16
12-27-70					2	1
12-30-70					2	4
1- 5-71	15	10			16	13
1-12-71	16	44			29	4
1-20-71	49	100			14	36
1-26-71	33	56			14	18
2- 2-71	77	202			13	7
2- 3-71			102	49	29	15
2-10-71	18	47	275	256	20	14
2-11-71			246	191		
2-13-71			105	70		
2-14-71			95	55	7	12
2-17-71			258	202		
2-25-71			30	13		
TOTALS	208	459	1,172	875	167	152

The 459 females spawned produced 2,423,635 eggs for an average of 5,280 per fish. Survival from green to eyed eggs ranged from 95.4 to 98% with the average 91.9%. We shipped 251,550 eyed eggs to the Mokelumne River Fish Installation. A sampling of adult steelhead weights and lengths was taken early in February. Fish ranged in size from 36 inches and 17½ lb to 18½ inches and 2 lb.

Return of Marked Steelhead

We observed 79 marked steelhead this year. Because of operating difficulties, only about one half the run was examined for marks. Neither lengths, weights, nor scales from marked steelhead were obtained. The origins of many of the marked fish could not be determined. The ones we could identify were reared at either Nimbus Hatchery, Coleman National Fish Hatchery, or Mokelumne River Fish Installation (see Table 2).

1971 Brood Year Nimbus Steelhead Planted

From April 28, to June 17, 1971, there were 740,700 fingerling steelhead planted in the American River in the vicinity of the fish ladder. They ranged in size from 1,844 to 565 per pound. An additional 95,900 fingerlings were held over to be released later as yearlings.

1970 Brood Year Nimbus Steelhead Planted (and Transferred)

Month	Size	Number	Pounds	Release site
9-70	26-32/lb	149,460	5,405	Transferred to Feather River Hatch.
10-70	12.5-14/lb	80,650	5,975	Trans. to ARH*
11-70	14/lb	49,980	3,570	Trans. to ARH*
1-71	9.2-9.9/lb	87,735	9,025	Clarksburg
2-71	5.8-8.9/lb	139,870	19,025	Clarksburg
2-71	6.8-7.6/lb	62,040	8,800	Miller Park
3-71	6/lb	1,400	233	Clarksburg (tagged)
3-71	6.3-7/lb	102,255	15,450	Clarksburg
TOTALS		673,390	67,483	

* Transferred to American River Hatchery, eventually planted in Yuba River.

1969 Brood Year Nimbus Steelhead Planted

Month	Size	Number	Pounds	Mark	Release site
7-70	3.2/lb	9,280	2,900	RP	American River-Sailor Bar to Watt Avenue

1970 Brood Year Summer Steelhead Planted

Month	Size	Number	Pounds	Mark	Release site
3-71	15.5-17/lb	7,275	450	Unmarked	Clarksburg
4-71	7.5-7.6/lb	60,170	7,990	LP	Clarksburg
TOTALS		67,445	8,440		

1971 Brood Year Summer Steelhead

In April, 1971, two shipments of eyed steelhead eggs, totaling 128,561 were received from the Roaring River Hatchery in Oregon, continuing the program of trying to establish a summer run of steelhead in the American River.

DISEASE

We had no serious disease problems this year. There was some incidence of infection from columnaris-type bacteria in the 1970 brood year king salmon, but losses were slight.

CAGE REARING EXPERIMENT

An experiment to determine the feasibility of cage culture of salmon in the American River was initiated with 1969 brood year salmon on June 14, 1970. King salmon fingerlings were placed in five floating cages in the American River upstream from the hatchery rack. The cages were anchored to a Hazel Avenue Bridge pier. The project was abruptly terminated on July 14, 1970, when the anchor rope broke, allowing the cages to float free. (On July 14, the flow in the American River reached a monthly peak of 4,002 cfs.) The platforms and cages wedged against the rack piers, and had to be dismantled. All fish in the cages were released without loss.

PUBLIC RELATIONS

Because of the tremendous increase in requests for guided tours it was necessary to limit such tours to college classes or groups with special interests in hatcheries or fish culture. Teachers and group leaders requesting tour information are sent brochures and informational leaflets which they may coordinate with the various signs and activities on the grounds.

It is estimated that 99,185 persons visited the hatchery this past year. More than a third of that number, or at least 38,315 persons visited the hatchery during the peak of the salmon migration in November. No record was kept of the number of groups touring the facility.

Table 1

Marked King Salmon Recoveries

Mark	Brood year*	Number recovered	Area of release	Size at release	Date of release	Number released	Origin
Ad-Lp	1969	1	Sacto. River at Red Bluff	37 mm	Oct., 1969	302,000	Winter run Sacto. River wild fish
Ad	1968	17	American R. at Nimbus Hatchery	1,200/lb	March, 1969	250,560	Fall run Nimbus Hatchery
Ad-RV	1968	7	Sacto. R. at Rio Vista	68/lb	Apr., May, & Sept., 1969	321,000	Fall run Coleman Hatchery
Ad-An-LV	1968	1	?	?	?	?	?
Ad-An-RV	1968	3	Mouth of American River	77/lb	June, 1969	250,299	Fall run Nimbus Hatchery
An-LV	1968	3	American River at Nimbus Hatchery	77/lb	June, 1969	250,265	Fall run Nimbus Hatchery
An-RV	1968	9	Sacto. River at Rio Vista	79/lb	June, 1969	252,904	Fall run Nimbus Hatchery
Ad-An	1967	6	Sacto. River at Rio Vista	12/lb	Jan., 1969	50,000	Fall run Feather Hatchery
LV	1968	3	These fish may have been 1968 brood year An-LV marks with regenerated anal fins.				
RV	1968	1	May have been 1968 brood year An-RV mark with regenerated anal fin.				
RP	1968	1	?				
Ad	?	4	These fish were definitely adults, hence do not fit any known Ad-marked releases.				

* Brood year was determined by the size of the marked fish.

Table 2

Marked Steelhead Recoveries

Mark	Brood year	Number observed	Area of release	Size at release	Date of release	Number released	Origin
Ad	1967	25	Sacramento River at Clarksburg	6.1-8.6/lb	March, 1968	209,840	Nimbus Hatchery
Ad	1968		Three-Mile Slough-Brannon Island	6.7/lb	March, 1969	22,579	Mokelumne River Fish Installation
Ad-LV	1969	6	Sacramento River at Clarksburg	6.3/lb	March, 1970	25,200	Nimbus Hatchery
Ad-LV	1969		Three-Mile Slough-Brannon Island	5.0/lb	March, 1970	980	Mokelumne River Fish Installation
Ad-RV	1969	5	Sacramento River at Rio Vista	6.0/lb	March, 1970	25,000	Nimbus Hatchery
Ad-RV	1969		Mokelumne River at New Hope Landing	5.0/lb	March, 1970	980	Mokelumne River Fish Installation
Ad-RP	1969	7	Sacramento River at Rio Vista	7.7/lb	Feb. 1970	118,186	Coleman National Fish Hatchery
LV	1968	19	Three-Mile Slough-Brannon Island	6.8-9.5/lb	March, 1969	40,951	Mokelumne River Fish Installation
LV	1969		"	5.5/lb	March, 1970	42,922	"
RV	1968	10	Mokelumne River-New Hope Landing	6.8-9.4/lb	March, 1969	37,674	"
RV	1969		"	5.1/lb	March, 1970	42,840	"
RP	1969	4	American River & Sacramento River	3.2/lb	June, July, 1970	12,780	Nimbus Hatchery
An	?	1	?	?	?	?	?
LV-RV	?	2	?	?	?	?	?

Appendix 1
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
July, 1970

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.
	AIR		WATER			
	Maximum	Minimum	Maximum	Minimum		
1	94	60	53	55	Clear	3,060
2	110	64	60	55	Clear	3,548
3	108	67	62	59	Partly Cloudy	3,519
4	112	72	62	60	Partly Cloudy	3,516
5	102	70	61	60	Clear	3,223
6	95	58	62	60	Clear	3,509
7	101	60	64	60	Clear	3,545
8	100	64	62	60	Clear	3,512
9	90	60	62	60	Partly Cloudy	3,511
10	92	62	62	60	Partly Cloudy	3,539
11	98	59	63	60	Clear	3,968
12	102	59	63	61	Clear	3,975
13	105	58	63	61	Clear	3,996
14	106	68	63	61	Clear	4,002
15	94	62	63	60	Clear	3,965
16	94	59	63	60	Partly Cloudy	3,488
17	102	60	64	61	Clear	3,490
18	106	64	64	62	Clear	3,504
19	102	62	64	61	Clear	3,507
20	107	63	64	63	Partly Cloudy	3,503
21	98	65	64	63	Clear	3,508
22	100	62	65	62	Clear	3,513
23	102	65	64	63	Clear	3,511
24	99	60	64	62	Clear	3,507
25	100	62	65	64	Partly Cloudy	3,503
26	101	64	65	64	Clear	3,503
27	98	64	65	64	Clear	3,506
28	94	62	66	63	Clear	3,514
29	96	62	66	63	Clear	3,502
30	94	59	65	62	Clear	3,497
31	90	56	65	61	Clear	3,512

Appendix 2
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
August, 1970

<u>Date</u>	<u>TEMPERATURES</u>				<u>Weather</u>	<u>American River Flow at Hatchery C.F.S.</u>
	<u>Maximum</u>	<u>AIR</u> <u>Minumum</u>	<u>Maximum</u>	<u>WATER</u> <u>Minimum</u>		
1	98	52	65	62	Clear	3,515
2	102	58	65	62	Clear	3,501
3	102	64	64	63	Clear	3,503
4	90	57	64	62	Partly Cloudy	3,509
5	94	58	65	62	Clear	3,507
6	93	58	65	62	Clear	3,506
7	96	62	65	63	Clear	3,492
8	98	58	66	63	Clear	3,505
9	104	62	65	63	Clear	3,494
10	106	66	65	64	Clear	3,488
11	106	63	66	63	Clear	3,490
12	100	63	65	63	Partly Cloudy	3,490
13	103	58	66	63	Clear	3,493
14	102	62	66	64	Clear	3,492
15	100	59	66	63	Clear	3,491
16	101	64	66	63	Clear	3,482
17	100	67	65	64	Clear	3,480
18	98	62	66	64	Clear	3,473
19	96	59	66	63	Clear	3,492
20	92	56	65	63	Clear	3,493
21	94	54	66	63	Partly Cloudy	3,491
22	90	56	66	63	Clear	2,965
23	94	54	66	63	Clear	2,879
24	96	54	66	63	Clear	1,461
25	96	53	66	63	Clear	1,444
26	89	54	65	63	Clear	1,521
27	94	55	65	63	Clear	3,474
28	94	56	65	62	Partly Cloudy	3,502
29	94	58	64	62	Partly Cloudy	3,499
30	94	58	64	61	Clear	3,512
31	92	56	64	62	Clear	3,507

Appendix 3
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
September, 1970

<u>Date</u>	<u>TEMPERATURES</u>				<u>Weather</u>	<u>American River Flow at Hatchery C.F.S.</u>
	<u>AIR</u> <u>Maximum</u>	<u>Minimum</u>	<u>WATER</u> <u>Maximum</u>	<u>Minimum</u>		
1	93	55	64	62	Clear	3,516
2	90	54	63	62	Clear	3,509
3	91	55	63	62	Clear	3,506
4	82	54	64	62	Partly Cloudy	3,509
5	84	58	64	62	Clear - Windy	3,519
6	92	58	64	61	Clear	3,512
7	100	68	65	63	Clear	3,491
8	93	63	65	63	Clear	3,510
9	100	60	65	63	Clear	3,528
10	102	60	65	63	Clear	3,510
11	87	60	65	62	Clear	3,521
12	78	60	64	62	Partly Cloudy	3,494
13	78	52	64	62	Clear	3,455
14	82	48	65	61	Clear	3,466
15	87	50	65	61	Clear	3,481
16	88	53	64	62	Clear	3,479
17	92	54	65	62	Clear	3,451
18	92	55	65	63	Partly Cloudy	3,445
19	78	62	64	64	Cloudy	3,444
20	82	50	64	62	Clear	3,461
21	86	52	65	61	Clear	3,512
22	90	52	65	62	Clear	3,544
23	90	52	64	64	Clear	3,517
24	90	54	65	62	Clear	3,520
25	90	56	65	62	Clear	3,520
26	93	53	65	62	Clear	3,523
27	94	52	65	63	Clear	3,512
28	94	55	65	63	Clear	3,502
29	92	55	67	63	Partly Cloudy	3,531
30	95	52	65	62	Clear	3,516

Appendix 4
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
October, 1970

Date	TEMPERATURES				Weather	American River
	AIR		WATER			Flow
	Maximum	Minimum	Maximum	Minimum		at Hatchery
						C.F.S.
1	99	54	65	62	Partly Cloudy	3,524
2	99	60	65	62	Clear	3,514
3	83	55	59	57	Clear	3,466
4	84	53	59	57	Clear	2,939
5	80	52	59	57	Partly Cloudy	2,464
6	78	52	59	57	Partly Cloudy	2,014
7	75	47	59	57	Clear	1,453
8	80	48	59	56	Partly Cloudy	1,306
9	88	48	59	56	Partly Cloudy	1,374
10	85	52	60	58	Partly Cloudy	1,490
11	86	54	59	57	Partly Cloudy	1,488
12	86	56	60	57	Clear	1,490
13	80	50	60	58	Clear	1,485
14	76	50	60	57	Clear	1,490
15	76	49	60	57	Clear	1,494
16	74	48	60	57	Clear	1,492
17	80	42	60	56	Partly Cloudy	1,485
18	77	52	60	56	Partly Cloudy	1,481
19	72	58	58	58	Partly Cloudy	1,507
20	66	49	58	57	Cloudy - Rain	1,533
21	70	50	57	56	Partly Cloudy	1,529
22	63	52	58	56	Partly Cloudy	1,531
23	59	54	58	57	Cloudy	1,552
24	66	44	60	58	Cloudy	1,781
25	66	44	59	57	Clear	1,754
26	65	43	59	57	Clear	1,770
27	69	36	59	57	Clear	1,780
28	70	40	59	57	Clear	1,800
29	71	40	59	57	Clear	1,812
30	74	46	59	57	Cloudy - Rain	1,789
31	74	46	59	57	Clear	1,736

Appendix 5
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
November, 1970

Date	TEMPERATURES				Weather	American River	Salmon
	AIR		WATER			Flow	
	Maximum	Minimum	Maximum	Minimum		at Hatchery C.F.S.	
1	74	44	59	57	Clear	1,753	-
2	75	46	59	57	Partly Cloudy	1,750	-
3	75	46	59	57	Partly Cloudy	1,743	300
4	63	54	57	57	Partly Cloudy	1,745	-
5	64	56	57	56	Cloudy - Rain	1,753	273
6	64	54	57	56	Cloudy - Rain	1,746	-
7	69	50	57	56	Cloudy	1,752	309
8	72	56	57	56	Cloudy	1,743	-
9	77	56	57	56	Cloudy	1,721	372
10	70	51	59	57	Partly Cloudy	1,731	263
11	70	55	56	56	Partly Cloudy	2,009	243
12	66	47	57	55	Clear	2,035	-
13	66	39	56	55	Clear	2,026	213
14	68	48	57	55	Partly Cloudy	2,076	-
15	70	45	56	55	Partly Cloudy	2,436	198
16	68	44	56	54	Partly Cloudy	2,565	-
17	67	42	57	54	Partly Cloudy	2,966	208
18	70	42	56	54	Clear	2,936	-
19	65	40	55	54	Partly Cloudy	2,973	364
20	64	40	56	54	Partly Cloudy	3,031	-
21	54	45	55	54	Partly Cloudy	3,033	323
22	64	49	54	54	Cloudy - Fog	3,013	-
23	68	46	56	55	Partly Cloudy	3,005	261
24	63	44	55	54	Cloudy - Rain	3,019	-
25	53	48	55	54	Cloudy - Rain	3,023	297
26	60	48	55	52	Partly Cloudy	3,029	-
27	60	44	53	52	Cloudy - Rain	3,024	390
28	60	48	52	52	Cloudy - Rain	3,047	-
29	56	52	52	52	Rain	3,076	-
30	54	46	53	52	Cloudy - Rain	4,004	444

Appendix 6
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
December, 1970

Date	TEMPERATURES				Weather	American River Flow at Hatchery		
	AIR		WATER			C.F.S.	Salmon	Steelhead
	Maximum	Minimum	Maximum	Minimum				
1	60	48	52	52	Cloudy - Rain	5,728	157	-
2	54	46	52	51	Cloudy - Rain	6,372	-	-
3	51	43	50	50	Cloudy - Rain	7,598	374	7
4	57	48	51	50	Cloudy - Rain	7,561	205	-
5	64	48	52	50	Partly Cloudy - Fog	7,447	1,076	-
6	62	52	50	50	Partly Cloudy - Fog	7,453	482	1
7	63	50	49	49	Cloudy - Rain	7,548	-	-
8	59	50	49	49	Cloudy - Rain	7,538	-	-
9	56	40	50	49	Partly Cloudy	7,588	522	-
10	60	34	49	48	Partly Cloudy	6,658	-	-
11	56	42	49	48	Partly Cloudy	7,564	-	-
12	54	41	49	48	Cloudy - Fog	7,576	348	-
13	44	42	49	48	Cloudy - Rain	7,537	-	-
14	58	37	48	48	Partly Cloudy	7,560	-	-
15	56	40	48	48	Cloudy - Rain	7,522	418	7
16	53	44	48	48	Cloudy - Rain	7,533	-	-
17	55	38	48	47	Cloudy - Rain	7,529	90	107
18	51	38	48	47	Partly Cloudy	7,569	230	-
19	52	34	48	47	Clear	7,533	-	-
20	50	33	47	47	Partly Cloudy - Rain	7,570	-	-
21	52	40	47	47	Cloudy - Rain	7,563	92	-
22	56	34	47	47	Partly Cloudy - Fog	7,529	-	-
23	58	36	47	47	Partly Cloudy	7,541	-	27
24	51	32	46	46	Partly Cloudy	7,469	-	-
25	46	30	46	46	Partly Cloudy - Fog	7,463	-	-
26	50	36	46	46	Cloudy - Rain	7,513	-	-
27	50	46	45	45	Cloudy - Rain	7,597	55	3
28	58	44	46	45	Cloudy - Rain	7,802	-	-
29	60	46	46	46	Partly Cloudy	7,973	-	-
30	55	38	46	45	Clear	7,991	43	6
31	54	36	46	45	Partly Cloudy	7,982	-	-

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Appendix 7
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
January, 1971

Date	TEMPERATURES				Weather	American River	Salmon	Steelhead
	AIR		WATER			Flow		
	Maximum	Minimum	Maximum	Minimum		at Hatchery C.F.S.		
1	54	40	46	45	Partly Cloudy - Rain	8,026	-	-
2	48	40	46	45	Clear	8,020	-	-
3	50	34	45	44	Clear	7,948	-	-
4	47	26	47	44	Clear	5,635	-	-
5	44	26	47	46	Partly Cloudy	3,932	63	54
6	50	26	46	46	Clear	4,006	-	-
7	51	28	45	44	Clear	4,021	-	-
8	54	30	44	43	Clear	4,026	-	-
9	54	36	44	42	Partly Cloudy	4,049	-	-
10	57	38	43	42	Cloudy	4,033	-	-
11	52	44	43	43	Cloudy	4,051	-	-
12	52	40	43	43	Partly Cloudy - Rain	4,058	-	93
13	54	38	43	43	Cloudy - Rain	4,038	-	-
14	58	44	43	43	Cloudy	4,035	1	-
15	56	46	44	43	Cloudy	5,629	-	-
16	58	48	44	43	Cloudy - Rain	8,055	-	-
17	70	50	45	43	Partly Cloudy	7,988	-	-
18	54	50	43	43	Partly Cloudy - Fog	7,953	-	-
19	59	48	43	43	Partly Cloudy - Fog	7,930	-	-
20	62	50	47	45	Partly Cloudy - Fog	7,670	-	199
21	54	45	46	38	Clear	7,469	-	-
22	58	34	47	45	Clear	7,525	-	-
23	58	35	47	45	Clear	7,542	-	-
24	59	40	47	45	Clear	7,506	-	-
25	58	34	47	45	Clear	7,515	-	-
26	62	36	48	46	Clear	6,471	-	121
27	58	38	47	46	Fog	5,570	-	-
28	52	43	46	46	Fog	5,454	-	-
29	48	42	46	46	Fog	5,471	-	-
30	44	42	46	46	Fog	5,517	-	-
31	48	41	45	45	Fog	5,506	-	-

Appendix 8
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
February, 1971

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.	Steelhead
	Maximum	<u>AIR</u> Minimum	Maximum	<u>WATER</u> Minimum			
1	46	46	45	45	Fog	5,466	-
2	50	42	46	45	Partly Cloudy - Fog	4,568	299
3	52	32	46	45	Partly Cloudy - Fog	4,592	195
4	56	38	48	45	Partly Cloudy	4,435	-
5	53	40	46	45	Partly Cloudy	3,605	-
6	62	39	47	46	Partly Cloudy	3,541	-
7	62	39	47	45	Cloudy - Fog	3,518	-
8	60	36	45	45	Partly Cloudy	3,498	-
9	60	36	48	46	Partly Cloudy - Fog	3,631	-
10	60	44	47	46	Partly Cloudy - Fog	3,537	630
11	58	42	47	45	Partly Cloudy - Fog	3,551	437
12	62	42	47	45	Partly Cloudy - Fog	3,549	-
13	68	40	46	46	Clear - Fog	3,538	175
14	70	46	47	46	Partly Cloudy	3,534	169
15	69	52	49	46	Clear	3,541	-
16	64	40	47	46	Cloudy	3,540	-
17	63	46	47	46	Partly Cloudy	3,513	460
18	62	42	47	46	Partly Cloudy - Rain	3,035	-
19	56	44	48	46	Partly Cloudy	3,007	-
20	63	38	47	46	Clear	3,006	-
21	64	38	47	46	Partly Cloudy	3,001	-
22	62	36	48	46	Clear	2,993	-
23	66	34	49	46	Clear	2,538	-
24	65	38	48	47	Partly Cloudy	2,505	-
25	54	39	48	47	Partly Cloudy	2,488	43
26	56	32	48	47	Partly Cloudy	2,510	-
27	53	32	46	46	Partly Cloudy	2,530	-
28	58	34	46	45	Partly Cloudy - Rain	2,474	-

Appendix 9
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
March, 1971

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.
	AIR		WATER			
	Maximum	Minimum	Maximum	Minimum		
1	58	32	47	46	Clear	2,243
2	63	27	47	46	Partly Cloudy	2,217
3	66	45	47	46	Cloudy	2,026
4	62	42	47	46	Cloudy	2,025
5	62	30	49	46	Clear	2,026
6	60	32	48	47	Clear	2,024
7	70	36	48	46	Clear	2,015
8	52	36	49	46	Partly Cloudy	1,998
9	68	39	43	47	Partly Cloudy	1,708
10	70	40	49	47	Partly Cloudy	1,416
11	70	51	49	47	Cloudy	1,407
12	60	41	49	47	Rain	1,444
13	66	40	49	47	Partly Cloudy	1,473
14	54	44	49	47	Cloudy - Rain	1,464
15	66	46	49	47	Partly Cloudy	1,402
16	68	40	54	49	Partly Cloudy	1,401
17	66	42	50	47	Clear	1,402
18	70	38	50	47	Clear	1,404
19	74	40	50	48	Clear	1,473
20	76	41	50	48	Clear	1,497
21	78	42	50	48	Partly Cloudy	1,484
22	74	44	50	49	Partly Cloudy	1,399
23	70	54	49	48	Cloudy - Rain	1,399
24	74	52	50	48	Clear	1,414
25	60	50	50	48	Cloudy - Rain	1,407
26	66	54	50	48	Partly Cloudy	1,449
27	65	46	52	48	Partly Cloudy	1,490
28	72	42	52	49	Clear	1,484
29	78	42	52	50	Clear	1,399
30	73	50	51	49	Clear	1,720
31	66	37	52	50	Clear	4,825

Appendix 10
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
April, 1971

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.
	AIR		WATER			
	Maximum	Minimum	Maximum	Minimum		
1	75	39	51	43	Clear	5,010
2	75	42	53	49	Clear	5,001
3	80	45	53	49	Clear	5,053
4	82	45	51	49	Clear	4,987
5	84	49	51	49	Clear	5,003
6	59	51	50	49	Cloudy	4,970
7	66	49	49	48	Cloudy	4,945
8	72	49	51	48	Clear	5,048
9	72	47	51	49	Cloudy	5,049
10	72	51	51	49	Partly Cloudy	5,059
11	72	52	52	49	Clear	5,067
12	80	42	52	50	Clear	5,071
13	76	49	52	51	Cloudy	5,026
14	80	53	52	50	Clear	5,016
15	80	48	53	51	Clear	4,991
16	73	47	52	50	Partly Cloudy	4,027
17	68	44	52	50	Cloudy	3,954
18	70	39	53	49	Partly Cloudy	3,941
19	76	40	54	51	Partly Cloudy	3,951
20	76	38	51	51	Partly Cloudy - Rain	3,979
21	65	36	53	49	Partly Cloudy	4,021
22	76	40	52	51	Partly Cloudy	4,041
23	74	50	52	51	Partly Cloudy	3,986
24	68	41	54	51	Partly Cloudy	4,009
25	74	40	53	50	Partly Cloudy	4,013
26	74	50	53	50	Partly Cloudy	3,919
27	73	46	53	51	Clear	3,950
28	74	46	52	51	Clear	3,971
29	72	46	52	51	Clear	4,044
30	82	42	54	51	Clear	3,987

Appendix 11
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
May, 1971

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.
	AIR		WATER			
	Maximum	Minimum	Maximum	Minimum		
1	74	48	53	51	Cloudy	3983
2	70	54	52	51	Cloudy - Rain	3991
3	74	46	52	51	Cloudy	4004
4	73	44	52	52	Cloudy	4025
5	78	44	53	53	Cloudy	4029
6	79	44	54	54	Cloudy	3993
7	78	46	53	54	Cloudy	3999
8	66	52	52	53	Cloudy - Rain	4001
9	78	47	54	52	Partly Cloudy	3995
10	87	52	55	53	Clear	3989
11	84	52	54	53	Partly Cloudy	3992
12	84	52	55	53	Partly Cloudy	3917
13	85	57	55	53	Partly Cloudy	3917
14	88	52	56	54	Clear	4000
15	88	52	55	54	Partly Cloudy	4037
16	85	48	56	54	Clear	4010
17	76	47	56	52	Partly Cloudy	3876
18	85	46	56	53	Partly Cloudy	4050
19	86	52	55	54	Clear	4003
20	85	50	55	54	Clear	4035
21	72	52	56	54	Partly Cloudy	3926
22	87	51	57	54	Partly Cloudy	3556
23	88	56	56	54	Clear	3561
24	92	52	54	54	Clear	3543
25	85	52	56	54	Partly Cloudy	3562
26	80	48	56	54	Partly Cloudy	3567
27	66	52	54	54	Cloudy - Rain	3561
28	72	54	55	53	Cloudy - Rain	3514
29	69	48	54	53	Cloudy	3522
30	70	48	55	53	Partly Cloudy	3510
31	71	48	54	53	Partly Cloudy	3521

Appendix 12
Nimbus Salmon and Steelhead Hatchery
Weather and Water Data for
June, 1971

Date	TEMPERATURES				Weather	American River Flow at Hatchery C.F.S.
	AIR		WATER			
	Maximum	Minimum	Maximum	Minimum		
1	80	46	56	53	Partly Cloudy	3511
2	80	46	56	53	Partly Cloudy	3515
3	82	43	56	53	Partly Cloudy	3502
4	86	50	57	55	Partly Cloudy	3516
5	92	54	57	54	Clear	3566
6	95	55	58	55	Clear	3484
7	90	56	57	54	Partly Cloudy	3491
8	90	54	56	55	Partly Cloudy	3492
9	84	54	56	55	Partly Cloudy	3496
10	90	57	57	55	Clear	3436
11	94	55	59	54	Clear	3467
12	93	54	57	55	Cloudy	3471
13	91	50	57	54	Clear	3456
14	92	56	57	55	Clear	3477
15	100	56	58	58	Clear	3511
16	98	62	57	56	Clear	3533
17	101	60	57	56	Clear	3517
18	94	60	57	56	Clear	3531
19	90	60	57	56	Clear	4646
20	98	63	57	56	Clear	4963
21	102	62	58	56	Clear	4935
22	94	62	57	56	Clear	5006
23	94	58	58	56	Clear	5050
24	94	56	57	56	Clear	5022
25	96	56	58	56	Partly Cloudy	4974
26	84	63	56	56	Rain	4481
27	84	54	57	54	Clear	4473
28	87	52	57	56	Clear	4499
29	93	57	60	57	Clear	4487
30	92	60	60	50	Clear	4479