

THE RESOURCES AGENCY OF CALIFORNIA  
Department of Fish and Game

File  
REF  
90234

ANNUAL REPORT  
NIMBUS SALMON AND STEELHEAD HATCHERY  
1965-66 FISCAL YEAR<sup>1/</sup>

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SUMMARY

A total of 13,676 king salmon (Oncorhynchus tshawytscha) entered Nimbus Hatchery during the 1965 fall run. Another 3,495, which went upstream through the weir, were counted as they were removed from the racks when they died and drifted downstream.

The portion of the run entering the holding ponds was composed of 5,295 large males, 7,595 large females, 744 grilse, and 42 small females. The latter were not spawned. Thus, 44% were males, including grilse, and 56% were females of which 6,887, or 90%, were spawned. These females produced 41,400,000 eggs for an average of 6,011 eggs each.

The incubating capacity of the hatchery building was reached early in December making it necessary to improvise incubation facilities. In addition, 1,086,000 green eggs were shipped to the Coleman National Fish Hatchery.

Some losses of fingerling salmon were incurred as a result of the Sacramento River Chinook Disease.

During the period of this report, about 41,500 persons visited the installation. Of this number, approximately 2,469 were in conducted tours.

Steelhead (Salmo gairdnerii gairdnerii) migrated to the hatchery from November, 1965 to March, 1966. During this period, 874 fish entered the hatchery. The 339 female steelhead spawned produced 1,716,840 eggs for an average of 5,064 per female.

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<sup>1/</sup> Submitted June, 1967

## INTRODUCTION

This is the 11th annual report of the Nimbus Salmon and Steelhead Hatchery which is operated by the California Department of Fish and Game under contract with the United States Bureau of Reclamation. It summarizes the number of fish trapped and spawned, eggs and fish produced, and water and air temperatures from July 1, 1965 to June 30, 1966.

### KING SALMON MAINTENANCE PROGRAM

#### History of the 1965 Salmon Run

The weir racks were installed by Nimbus Hatchery personnel on October 1, 1965. Usually the weir is installed by the end of August, but reconstruction of the ladder, damaged by high water in December, 1964, delayed placing the weir. To reduce the possibility of salmon escaping upstream through holes in the steel webbing at the base of the fish weir, some 60 tons of 3" x 6" cobbles were placed on the upstream side of the weir.

Water was diverted through the reconstructed ladder on October 11, and the first salmon of the season appeared in the holding pond on October 12. A total of 13,676 king salmon migrated into the hatchery during the 1965 fall run. In addition to these, 3,495 went upstream through the weir and were removed from the racks as they died and drifted downstream. Previous reports showed the numbers of salmon migrating into the hatchery and those escaping through the weir as the total migrating to the hatchery.

The portion of the run entering the holding ponds was composed of 5,295 large males, 7,595 large females, 744 grilse, and 42 small females. The latter were not spawned. Thus, the run was composed of 44% males, including grilse, and 56% females. Of the 7,595 large females entering the holding ponds, 6,887, or 90%, were spawned, 547, or 7.2%, died in the ponds without being spawned, and 161, or 2.1%, were too green when killed to spawn successfully.

The 6,387 females spawned produced 41,400,000 eggs for an average of 6,011 eggs each.

Early in December the incubating capacity of the hatchery was reached. To care for the later eggs, 11 floating frames were placed in each of 8 nursery ponds and 10 standard egg baskets were set into each frame where approximately 19,000,000 eggs were incubated. In addition, 1,086,000 eggs were shipped to the Coleman National Fish Hatchery.

While the eggs were accommodated, the method used was unsatisfactory. It was difficult to care for the eggs because poor drainage made it impossible to control the depth of the water. Inadequate circulation of water caused excessive smothering. Algae was a nuisance, particularly in the later stages of egg development. Only 54% of the fish from eggs incubated in the ponds survived to swimup, whereas, 75% reached swimup from eggs incubated in the hatchery building.

It was mid-February before there was sufficient space in the hatchery to allow the eggs to be moved from the ponds.



### Water Temperature Control

The temperature control shutters were adjusted on October 19, 1965, to start the flow of cooler water in the river below Folsom Dam. On October 19, water temperatures at the hatchery varied from 62-59°. By October 22, water temperatures were down to 57-55°. On March 22, 1966, the shutters were replaced to store cold water for release in the fall of 1966.

### Miscellaneous Marked King Salmon

A few marked king salmon from other waters entered the hatchery, 6 salmon with Columbia River marks, 5 with right ventral fins removed, 1 with the left ventral fin removed, and 1 with its dorsal removed - a Sacramento River mark. Also, a salmon with a sonic tag attached entered the hatchery. This fish was one of a group that had been captured in the San Joaquin River-Delta, and sonic tags were attached in order to follow the movement of these fish in the San Joaquin River.

### Planting 1964 Brood Year King Salmon

From July 1, to December 25, 1965, 618,700 king salmon reared at Nimbus were released into the American River at the hatchery. Of this number, 78,781 were released as yearlings. They were marked by removal of the right maxillary. These fish averaged 8.1 per pound.

Also, 79,650 king salmon, which were reared at the Moccasin Creek and San Joaquin hatcheries, were marked by removing the left maxillary and then were released into the American River at the hatchery. These fish averaged 1.6 per ounce.

### Planting 1965 Brood Year King Salmon

From January 7, through June 30, 1966, 24,153,583 king salmon were released into the American River at the hatchery. Most of these fish were swimup fry. They were released at night to minimize predation by sea gulls.

### Repair of Storm Damaged Structures

Approximately 175 feet of the fish ladder destroyed during the December, 1964 flood was rebuilt, along with the stairway, fencing, and rack storage structures. Many tons of heavy granite riprap were set in place in the fish ladder area as protection from high water.

### Sacramento River Chinook Disease

Juvenile king salmon mortality which could be attributed solely to the Sacramento River Chinook Disease was not as severe as expected. Of the 2,000,000 king salmon held at the hatchery for observation of S.R.C.D. symptoms, approximately 500,000, or 25%, succumbed to this disease.

In 1964 a closed water heating system was constructed and used to determine the effect of various water temperatures on the Sacramento River Chinook Disease. Studies at the Coleman National Fish Hatchery indicate that warm water near the upper limits tolerated by salmon eggs may eliminate or suppress the disease.

Operation was hampered by inadequate control of the heating, making it difficult to hold temperatures required. The thermostats were changed for this year's testing and nearly constant water temperatures could be held.

The results of this year's incubation of salmon eggs and resulting fry in the warmed water were no different from those salmon hatched in the colder water of the hatchery supply. The disease was present in some lots of fish, while other lots, apparently under the same conditions, were healthy. At present, warming water for egg incubation and hatching has had no effect on the occurrence of the disease at Nimbus Hatchery.

We know that some females carry this disease and pass it on to their young, while other females are free of the disease. When diseased salmon are placed in contact with disease free salmon, the disease may be passed on to these fish. To determine the feasibility of incubating eggs from individual females separately to reduce the incidence of the disease, batteries of 2-gallon plastic bottles were installed. The eggs of each female used were placed in a separate container. Then one-half of each female's eggs were placed in a bottle. The remaining one-half of the eggs were placed with eggs taken from females in the same manner into a standard hatchery incubation basket.

The disease did not appear as long as the progeny of each female was kept apart. However, when the young fish in the separated groups were placed together, the disease appeared.

We plan to continue this work next year.

#### Disposal of Salmon Carcasses

About 159,700 pounds of spawned salmon were picked up by various state and county agencies, charitable organizations, and Indians of California. Approximately 53,500 pounds, unfit for human consumption, were taken by a rendering company.

#### STEELHEAD MAINTENANCE PROGRAM

##### History of the 1965-66 Steelhead Run

Steelhead began to arrive with the salmon in early November, 1965. Until December 22, they were returned to the river. After December 28, all steelhead were held for spawning. The number of fish entering the holding ponds each month after December 28 was as follows:

<u>Month</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
December	139	122	261
January	151	179	330
February	<u>84</u>	<u>199</u>	<u>283</u>
Total	374	500	874

The fish ladder was closed February 23, 1966, since enough steelhead eggs had been taken to meet the needs of the Nimbus Hatchery.

A total of 339 females were spawned producing 1,716,840 eggs, an average of 5,064 eggs per female.

### Steelhead Marking Program

Since 1963 approximately 50% of the yearling steelhead have been planted to determine whether or not this plant in the Sacramento River near Clarksburg would produce more returning adult steelhead than the past practice of releasing them in the American River at the hatchery. Each year, excepting 1965, approximately 50% of the yearling steelhead have been marked by removing these right ventral fins and planted in the Sacramento River, and the other 50% have been marked by removing their left ventral fins and released into the American River at the hatchery.

As the same mark has been used each year, the returns are based on the accumulated yearly plants.

In March, 1963, 23,029 steelhead of the 1962 brood year were marked and released in the Sacramento River and 16,390 were marked and planted in the American River at the hatchery.

In January and February of 1964, 92,658 steelhead of the 1963 brood year were marked and planted in the Sacramento River and 91,182 were marked and planted in the American River.

The 1964 brood year steelhead, which would have been planted in 1965, were not marked because of heavy losses during the December, 1964 flood, only a few fish remained to be planted.

During February and March of 1966, 68,993 steelhead of the 1965 brood year were marked and planted in the Sacramento River and 73,215 were released into the American River.

The accumulative returns to the hatchery from these groups of fish are now 886 from the Sacramento River releases and 395 from the American River releases. This is over twice as many fish from the Sacramento River plants than the American River plants.

The results of this marking program is sufficiently conclusive that future planting of steelhead will be made in the Sacramento River near Clarksburg.

### PUBLIC RELATIONS

About 41,500 persons visited the hatchery during this report period. Included in this total were approximately 2,470 people in 50 organized groups.

687

72,187

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APPENDIX

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TABLE A-1  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
July, 1965

Date	Temperature				Weather	American River flow at hatchery C.F.S.
	Air		Water			
	Maximum	Minimum	Maximum	Minimum		
1	90	56	62	58	Clear	2,810
2	98	64	61	58.5	"	2,796
3	96	63	60	57	"	2,799
4	100	62	61.5	57.5	"	2,792
5	100	68	61	57.5	"	2,795
6	89	55	60	58	"	2,844
7	92	53	61	57	"	2,946
8	92	56	60	58	"	2,989
9	88	57	60	57	"	2,988
10	88	53	60	57	"	3,196
11	88	54	60	54	"	3,194
12	93	58	59.5	57.5	"	3,191
13	94	60	59	55.5	"	3,198
14	99	58	60	56.5	"	3,201
15	102	64	59.5	57	"	3,203
16	102	64	59	57	"	3,202
17	94	64	59.5	55.5	"	3,203
18	95	64	60	57.5	"	3,191
19	88	59	59	57.5	"	3,190
20	86	56	59	57.5	"	3,203
21	88	56	59	57.5	"	3,204
22	93	57	60	57.5	"	3,203
23	94	60	59.5	57.5	"	3,204
24	96	58	60	58	"	3,204
25	88	58	59	57.5	Humid, partly cloudy	3,191
26	80	58	59	58	Clear	3,202
27	88	54	61	57.5	"	3,193
28	93	58	61	57.5	"	3,203
29	94	58	60.5	57.5	"	3,200
30	94	60	60	58.5	"	3,200
31	95	67	60	58.5	"	3,207

TABLE A-2  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
August, 1965

Date	Temperature				Weather	American River flow at hatchery C.F.S.
	Air		Water			
	Maximum	Minimum	Maximum	Minimum		
1	100	64	61	59	Clear	3,499
2	94	62	61	60	"	3,495
3	92	61	61.5	59	"	3,499
4	98	58	62	60	"	3,489
5	98	64	61.5	60	"	3,502
6	98	60	62	60	"	3,506
7	96	58	62.5	60	"	3,500
8	94	60	62.5	60	"	3,499
9	100	60	63	60.5	"	3,501
10	95	70	62	60.5	"	3,500
11	89	60	62	60	Rain	3,500
12	90	60	63	60	"	3,501
13	97	60	63.5	60	Clear	3,501
14	96	62	61.5	60	"	3,501
15	95	58	62	59.5	Partly cloudy	3,501
16	94	65	62.5	61	" "	3,502
17	94	58	64	61	Clear	3,503
18	90	60	63	60	"	3,500
19	85	60	63	60	"	3,501
20	86	58	63.5	60.5	"	3,499
21	86	58	63	60.5	"	3,502
22	86	58	63	60.5	"	3,502
23	84	58	63	61	"	3,502
24	86	58	64	61	"	3,504
25	88	60	64.5	61.5	Partly cloudy	3,506
26	89	62	63.5	61.5	" "	3,505
27	94	60	64	61	Clear	3,503
28	95	62	64.5	62	"	3,504
29	95	60	64	61.5	"	3,504
30	90	60	64	62	"	3,504
31	84	56	64	62	"	3,503

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TABLE A-3

Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
September, 1965

Date	Temperature				Weather	American River flow at hatchery C.F.C.
	Air		Water			
	Maximum	Minimum	Maximum	Minimum		
1	82	58	64	62	Clear	3,203
2	86	54	64	61.5	"	3,201
3	84	57	64.5	62	"	3,201
4	80	52	64	62	"	3,200
5	78	51	63.5	61.5	"	3,204
6	76	53	63	61.5	"	3,202
7	78	55	63	61.5	"	3,199
8	82	52	64	61	"	3,189
9	86	53	64	62	"	3,195
10	86	58	65	62.5	"	3,195
11	80	52	64.5	62	"	3,185
12	84	50	64	62	"	3,193
13	85	50	64.5	62.5	"	3,193
14	89	51	64	62.5	"	3,198
15	99	58	64	62	"	3,201
16	89	60	65.5	62	Clear-strong wind	3,196
17	76	60	62.5	60.5	Clear-wind	3,199
18	75	56	62.5	60	Clear	3,188
19	78	54	62.5	60.5	"	3,203
20	79	48	63	61	"	3,200
21	84	50	63.5	61	"	3,198
22	86	52	63	61.5	"	3,199
23	87	52	63	61.5	Partly cloudy	3,199
24	84	52	63.5	61.5	" "	3,199
25	74	52	63	61	Clear	3,189
26	73	52	62	61	Partly cloudy	3,189
27	74	58	62	60	Clear	3,187
28	95	48	62.5	60	"	3,186
29	95	50	62	60	"	3,186
30	90	52	62	60	"	3,185

TABLE A-4  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
October, 1965

Date	Temperature				Weather	American River
	Air		Water			flow
	Maximum	Minimum	Maximum	Minimum		at hatchery
1	86	50	63	61	Clear	C.F.S.
2	84	49	62.5	61	"	3,139
3	80	47	63	61	"	2,988
4	74	50	62	60	"	2,494
5	79	52	63	60.5	Partly cloudy	2,492
6	82	52	63	60.5	Clear	2,495
7	88	53	63	60.5	"	2,497
8	82	58	63	61	"	2,280
9	79	58	62.5	61	Partly cloudy	2,499
10	75	50	62.5	60.5	Clear	2,495
11	99	48	62.5	60	"	2,495
12	80	51	62.5	61	Partly cloudy	1,997
13	80	52	63	60.5	Clear	1,998
14	68	52	61	60	Cloudy-rain	1,992
15	64	48	62	60	Clear-fog a.m.	2,000
16	68	42	61	59	Clear	2,002
17	70	43	60	53.5	"	1,993
18	72	48	60	59.5	"	1,999
19	74	50	61.5	59	"	2,000
20	80	58	60	56.5	Partly cloudy	2,001
21	80	50	57.5	56.5	" "	2,001
22	82	50	57	55	Clear	2,001
23	84	48	57.5	55	"	2,002
24	82	48	57	55	"	2,002
25	82	48	57	55	"	2,003
26	82	48	57	55	"	2,003
27	78	48	57	54.5	Partly cloudy	1,997
28	77	48	56.5	54.5	Clear	1,990
29	78	50	57	55	"	1,990
30	79	44	57	55	"	1,990
31	77	44	57	54.5	Partly cloudy	1,996

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TABLE A-5  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
November, 1965

Date	Temperature				Weather	American River	Salmon
	Air		Water			flow	
	Maximum	Minimum	Maximum	Minimum		at hatchery	
						C.F.S.	
1	65	46	55.5	55	Partly cloudy	1,758	146
2	65	42	56	54.5	" "	1,799	--
3	63	42	56	54.5	" "	1,798	36
4	72	46	56.5	54.5	Clear	1,798	--
5	68	48	56.5	55	Partly cloudy	1,804	71
6	70	44	57	55	Clear	1,805	--
7	70	46	56.5	55.5	Partly cloudy	1,805	182
8	64	54	57	54.5	Cloudy	1,813	236
9	63	42	57	55.5	Partly cloudy	1,814	73
10	64	42	57	55	" "	1,810	151
11	66	40	56.5	54.5	" "	1,809	292
12	54	52	55.5	50	Cloudy-rain	1,806	345
13	54	54	55	54.5	" "	1,805	89
14	62	50	55	54.5	" "	1,797	107
15	66	50	55.5	54.5	Partly cloudy-rain	1,811	1,594
16	58	48	55	54.5	Cloudy-rain	1,994	345
17	68	52	55	54	" "	1,993	295
18	60	50	54.5	54	" "	1,993	200
19	64	48	55	54	Partly cloudy	1,994	732
20	60	44	56	54	" "	1,994	784
21	54	40	55	53.5	" "	1,993	667
22	54	38	54.5	53.5	" "	1,994	138
23	53	47	53.5	53	" "	1,993	143
24	54	44	53	52.5	" " -rain	1,984	383
25	52	40	52	52	" " "	2,496	--
26	52	34	52	51.5	Cloudy	2,637	859
27	54	42	53	52	Clear	3,508	462
28	54	33	54	52	Partly cloudy	3,520	346
29	54	36	53	52	" "	3,496	516
30	58	38	54	52	Fog-partly cloudy	3,505	311

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TABLE A-6  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
December, 1965

Date	Temperature				Weather	American River	Salmon
	Air		Water			flow	
	Maximum	Minimum	Maximum	Minimum		at hatchery	
1	50	38	52	51	Fog	C.F.S. 3,507	214
2	44	40	51	51	"	3,505	122
3	44	40	51	51	"	3,503	196
4	46	40	51	50.5	"	3,503	196
5	44	38	50	50	"	3,503	213
6	44	36	50	50	"	3,498	119
7	38	38	50	50	"	3,497	164
8	38	38	49.5	49	"	3,500	98
9	40	36	49	49	"	3,498	127
10	42	38	49	49	"	3,502	126
11	46	38	49.5	49	Cloudy-rain	3,500	147
12	40	37	49.5	49	Partly cloudy	3,500	116
13	50	42	50	48.5	" "	3,504	155
14	50	38	49.5	48	Clear, a.m. fog	3,493	107
15	50	38	49	47.5	Clear	3,493	79
16	45	28	48.5	47	"	3,498	--
17	48	28	48	47	"	3,499	116
18	46	28	48	47	"	3,499	--
19	47	28	48	47	Partly cloudy	3,500	--
20	42	26	48	47	" "	2,984	268
21	35	28	47	47	Fog	2,248	--
22	50	32	47	46.5	Clear	1,976	254
23	47	28	46	45.5	Partly cloudy	1,781	--
24	49	34	45.5	45.5	Cloudy-rain	1,782	138
25	52	40	46	45.5	Partly cloudy	1,778	--
26	47	30	46	45.5	Cloudy	1,780	--
27	48	34	46	45	Partly cloudy	1,803	215
28	46	42	47	46	Cloudy-rain	1,801	--
29	51	42	47	46	" "	1,797	168
30	46	40	46	44.5	" "	1,798	--
31	50	40	44.5	43	Partly cloudy	1,792	150

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TABLE A-7

Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
January, 1966

Date	Temperature				Weather	American River	Salmon	Steelhead
	Air		Water			flow		
	Maximum	Minimum	Maximum	Minimum		at hatchery C.F.S.		
1	48	29	43.5	43	Partly cloudy	1,799	--	--
2	48	28	43.5	42.5	" "	1,801	--	--
3	50	38	46	46	Cloudy	1,801	87	29
4	48	42	44	44	Rain	1,796	--	--
5	46	44	46	44	Cloudy-rain	1,798	43	--
6	56	44	48	46	Partly cloudy	1,973	--	--
7	52	50	48	48	" "	2,502	65	--
8	59	46	46	46	" "	2,503	--	--
9	52	38	46	46	Cloudy	2,500	--	--
10	56	42	46	46	Partly cloudy-fog	2,500	143	150
11	52	42	46	46	" "	2,504	--	--
12	48	38	46	45	" "	2,486	--	--
13	52	34	46	45	Clear	2,491	--	--
14	48	32	46	45	Partly cloudy-fog	2,490	41	28
15	64	34	47	45	Clear-a.m. fog	2,490	--	--
16	62	36	46	45	Clear	2,480	--	--
17	58	40	48	46	Clear	2,428	--	--
18	52	30	48	46	"	2,496	44	36
19	52	30	47	46	"	2,490	--	--
20	53	28	47	46	Partly cloudy	2,450	--	--
21	49	28	46	45	" "	1,998	48	--
22	43	30	46	45	" " -rain	1,994	--	--
23	52	31	46	45	Clear	1,994	--	--
24	50	30	46	46	Partly cloudy	1,980	--	--
25	52	32	46	45	" "	1,796	50	86
26	57	33	46	45	" "	1,799	--	--
27	58	34	47	45	" "	1,799	--	--
28	58	30	47	45	" "	1,799	--	--
29	50	41	46	46	Cloudy-rain	1,794	--	--
30	50	41	46	46	" "	1,798	--	--
31	52	42	46	46	Partly cloudy	1,798	--	--



Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
February, 1966

Date	Maximum	Minimum	Maximum	Minimum	Weather	American River flow at Hatchery	C.F.S.	Salmon	Steelhead
1	52	43	45	45	Cloudy-rain	1,793		51	87
2	52	34	46	45	Cloudy	1,799		--	--
3	50	36	46	45	Cloudy-rain	1,797		--	--
4	54	44	45	45	" "	1,794		--	--
5	54	44	46	45	" "	1,800		--	--
6	54	42	46	45	Partly cloudy	1,801		--	--
7	48	30	47	45	Clear	1,795		--	--
8	53	30	47	46	"	1,797		25	75
9	52	34	45	45	Partly cloudy	1,796		--	--
10	52	34	46	45	" "	1,796		--	--
11	52	36	46	45	" "	1,796		--	--
12	52	36	47	45	" "	1,796		--	--
13	51	32	48	45	" "	1,797		--	--
14	54	42	48	47	Clear	1,792		--	--
15	58	34	49	48	"	1,793		--	63
16	58	34	48	47	"	1,797		--	--
17	58	30	46	45	Partly cloudy	1,798		--	--
18	58	36	44	44	Cloudy	1,800		--	--
19	59	43	46	45	Cloudy-rain	1,801		--	--
20	60	36	49	45	Partly cloudy	1,797		--	--
21	64	36	48	45	" "	1,797		--	--
22	64	44	47	46	Cloudy-rain	1,798		--	--
23	60	48	47	46	Partly cloudy	1,797		--	58
24	56	44	47	45	Cloudy-rain	1,792		--	--
25	52	34	47	46	Partly cloudy	1,799		--	--
26	56	43	48	46	Clear	1,801		--	--
27	59	42	47	46	"	1,800		--	--
28	58	36	46	46	Cloudy	1,800		--	--

TABLE A-9  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
March, 1966

Date	Temperature				Weather	American River
	Air		Water			flow
	Maximum	Minimum	Maximum	Minimum		at hatchery
						C.F.S.
1	55	42	47	47	Partly cloudy	1,800
2	52	29	47	46	" "	1,795
3	52	27	47	45	" "	1,781
4	55	32	46	45	Cloudy	1,799
5	62	44	47	46	Partly cloudy	1,777
6	64	46	48	46	" "	1,765
7	62	48	48	46	Cloudy	1,802
8	64	46	48	47	"	1,801
9	62	46	48	47	Cloudy-rain	1,802
10	64	50	47	46	Cloudy	1,802
11	68	40	48	46	Partly cloudy	1,802
12	70	46	48	47	" " -rain	1,803
13	77	47	49	48	" "	1,795
14	66	48	48	47	" "	1,884
15	66	48	48	47	" "	2,254
16	58	40	48	47	" "	3,016
17	60	34	49	47	" "	3,497
18	64	40	48	46	Clear	4,002
19	62	46	46	45	Partly cloudy	4,001
20	60	32	50	47	Clear	4,003
21	61	39	49	47	Partly cloudy	4,004
22	68	39	40	48	Clear	4,005
23	70	40	50	47	"	4,004
24	72	46	51	49	"	4,003
25	68	44	51	50	"	3,994
26	71	42	52	50	"	3,990
27	70	45	51	49	" -a.m. fog	3,993
28	72	46	52	49	" " "	2,982
29	76	45	53	50	"	2,498
30	78	44	53	51	"	2,496
31	82	48	53	52	"	2,497

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TABLE A-10  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
April, 1966

Date	Temperature				Weather	American River
	Air		Water			flow
	Maximum	Minimum	Maximum	Minimum		at hatchery
						C.F.S.
1	83	48	55	52	Clear	2,496
2	84	50	55.5	53	"	2,496
3	82	47	55	53	"	2,492
4	72	50	54	53	"	2,496
5	82	48	54	52	"	2,494
6	72	49	53	51	"	2,495
7	68	46	53	51	Partly cloudy	2,455
8	72	49	53	50.5	" "	1,957
9	62	52	52	52	Cloudy-rain	1,497
10	54	46	52	51	" "	1,491
11	67	46	53	51	Cloudy	1,498
12	67	47	53	52	Partly cloudy	1,496
13	70	42	54	52	Clear	1,496
14	78	43	54	53	"	1,500
15	81	64	55	53	Partly cloudy	1,507
16	85	50	55	52	Clear	1,503
17	58	50	52	52	"	1,501
18	61	50	53	52	Partly cloudy	1,498
19	62	42	55	54	Clear	1,497
20	62	38	54	54	"	1,498
21	62	42	55	53	"	1,449
22	80	40	57	55	Partly cloudy	1,375
23	80	58	55	55	Clear	1,297
24	86	50	55	55	"	1,293
25	82	56	55	54	Partly cloudy	1,075
26	72	52	58	54	Clear	1,005
27	78	50	58	57	"	1,003
28	82	50	56	56	"	1,004
29	80	48	56	55	"	1,000
30	84	46	56	56	"	1,005

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TABLE A-11  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
May, 1966

Date	Temperature				Weather	American River flow at hatchery C.F.S.
	Air		Water			
	Maximum	Minimum	Maximum	Minimum		
1	87	47	57	54	Clear	1,000
2	90	49	56	55	"	1,000
3	95	55	56	55	Partly cloudy	1,000
4	78	51	56	53	" "	1,000
5	78	52	57	54	" "	1,000
6	78	50	58	57	Clear	1,006
7	84	58	57	56	Partly cloudy	1,000
8	78	52	55	54	" "	1,000
9	64	57	56	52	Cloudy	1,003
10	70	52	56	55	"	1,003
11	84	50	56	55	Partly cloudy	1,003
12	84	50	57	57	Clear	1,001
13	86	52	56	55	Partly cloudy	1,000
14	78	51	58	55	" "	1,000
15	80	51	56	55	Clear	1,000
16	80	52	58	56	"	1,000
17	88	52	61	56	"	1,001
18	92	58	59	58	"	1,001
19	95	60	59	56	"	1,000
20	92	60	57	56	"	1,000
21	73	51	55	55	"	1,000
22	80	52	60	57	Partly cloudy	1,002
23	82	52	59	58	Clear	1,000
24	92	56	58	57	Partly cloudy	1,000
25	92	58	58	56	Clear	1,000
26	84	52	57	56	Partly cloudy	1,001
27	78	52	57	57	" "	1,000
28	75	52	57	56	" "	1,000
29	72	50	57	56	" "	1,001
30	75	54	58	57	" "	1,001
31	76	50	56	56	" "	1,000

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TABLE A-12  
Nimbus Salmon and Steelhead Hatchery  
Weather and Water Data  
June, 1966

Date	Temperature				Weather	American River
	Air		Water			flow
	Maximum	Minimum	Maximum	Minimum		at hatchery
						C.F.S.
1	72	52	59	57	Partly cloudy	1,000
2	76	48	59	55	Clear	1,000
3	80	50	59	57	Partly cloudy	1,000
4	83	52	58	58	" "	1,000
5	88	58	58	57	" "	1,000
6	68	62	58	55	Cloudy-rain	1,001
7	76	57	57	56	Partly cloudy	1,001
8	84	62	57	56	" "	1,001
9	88	58	59	56	Clear	1,001
10	82	65	59	58	Partly cloudy	1,002
11	86	68	61	59	Clear	1,002
12	92	64	61	61	"	1,001
13	102	76	59	59	"	1,004
14	108	68	59	58	"	1,003
15	105	70	59	59	"	1,124
16	96	66	61	59	"	1,670
17	92	60	61	59	"	2,208
18	98	60	61	59	"	2,994
19	99	62	59	58	"	2,994
20	93	62	58	57	"	2,974
21	76	58	58	56	Partly cloudy	2,490
22	80	58	58	56	Clear	2,005
23	80	54	59	56	"	2,503
24	88	52	61	56	"	2,499
25	96	56	59	57	"	2,499
26	96	60	59	57	"	2,497
27	98	61	59	58	"	2,497
28	98	64	58	58	"	2,497
29	86	60	59	58	"	2,497
30	84	57	60	60	"	2,501

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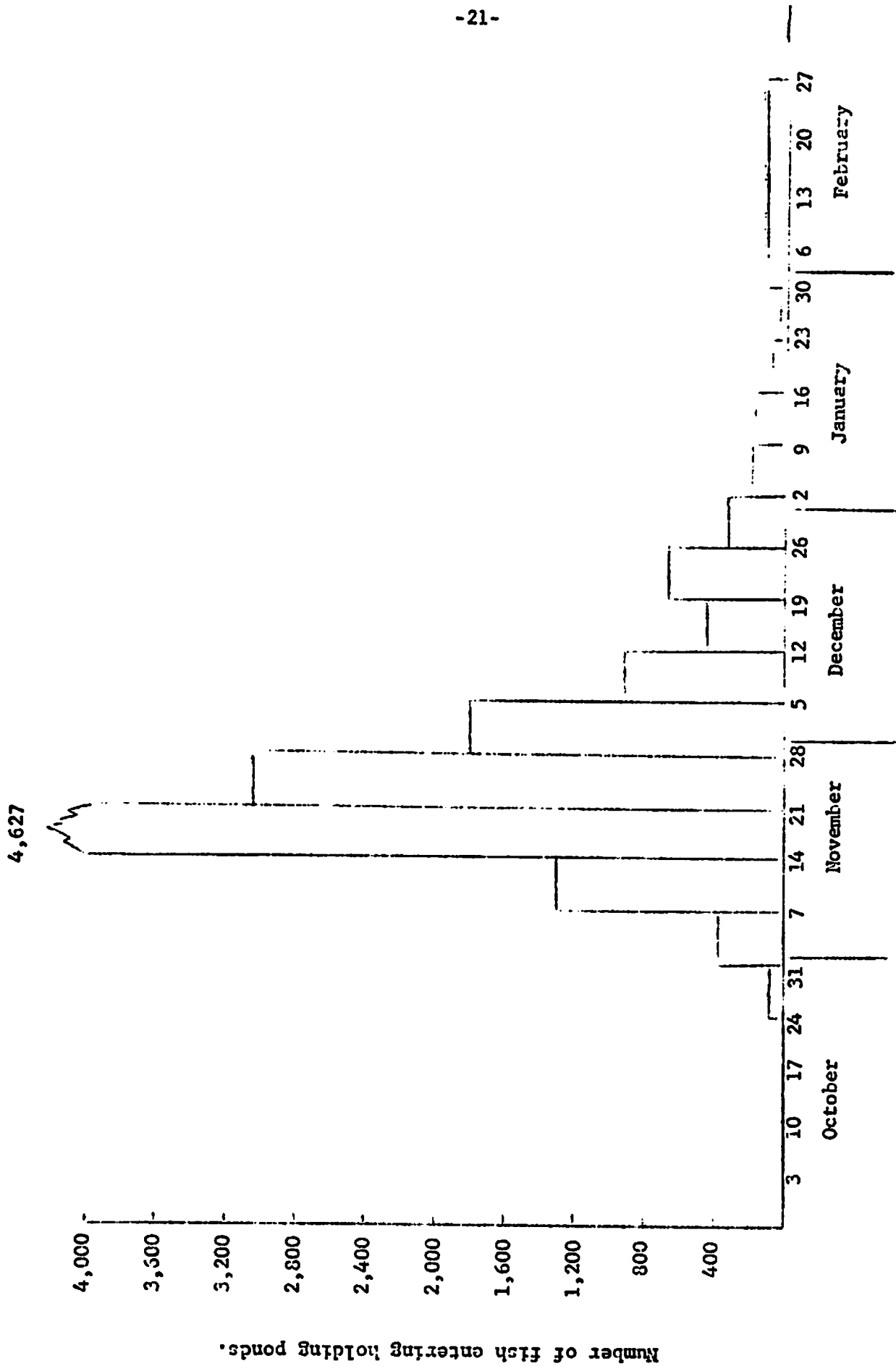


FIGURE A-1. Nimbus Salmon and Steelhead Hatchery fall run of king salmon - 1965-66