

THE 1956 KING SALMON POPULATION ESTIMATES
FOR THE RIVERS OF THE
SACRAMENTO-SAN JOAQUIN RIVER SYSTEM FROM BUTTE CREEK SOUTH

Introduction

The California Department of Fish and Game continued its annual survey during the fall and winter of 1956 to estimate the numbers of king salmon spawning in the Central Valley rivers. Salmon population figures were obtained by counting the dead salmon carcasses on each river (with the exception of the Mokelumne) and then estimating what percentage of the total run was observed. Factors such as physical characteristics of the stream, turbidity, volume of flow and number of survey trips were considered in making the estimates.

The size of the salmon run on the Mokelumne River was determined by counting the fish as they passed through the fish ladder at Woodbridge Dam. In addition, the spawning area on the Mokelumne was surveyed in an attempt to obtain information on the distribution of the spawning salmon in relation to the Comanche Dam site.

A three-man crew was assigned to cover the Feather and Yuba Rivers. The American, Cosumnes and Mokelumne were surveyed by a two-man crew. On the Stanislaus, Tuolumne and Merced Rivers the salmon population survey was conducted by a two-man crew with the assistance of a third man during the month of December. Representatives of all three crews participated in carcass recovery work on Butte Creek in late September and early October. The project supervisor worked with each of the crews from time to time.

The census work followed the same pattern as in past years. As each salmon carcass was located it was picked up with a gaff hook, examined for tags and marks, and then cut in two with a machete. Such a procedure prevented recounting the same fish on subsequent trips over the same area and enabled the observer to determine if the fish was spent, part spent, or ripe. The sex of the fish could likewise be established in case of doubt.

Butte Creek

Butte Creek supports mainly a spring salmon run. Flows are usually too low to provide access for fall run salmon. The 1956 spring salmon run started to spawn in late September, utilizing mainly the section of stream between Parrott-Phelan Dam and the Centerville powerhouse. A few fish spawned on gravel beds in the rugged canyon from the powerhouse upstream to the intake dam below De Sabla. Flows in the latter section were very low and suitable gravel areas were quite limited.

In a matter of about two weeks from the time spawning commenced the entire run had spawned and died. This simplified carcass recovery since it was not necessary to cover the stream over a period of several months as would be the case with a fall salmon run.

A total of 608 carcasses were counted in Butte Creek between September 26 and October 8, 1956. On October 25 the stream was checked again, but only two skeletons were located. It is estimated that 20 percent of the spring salmon population was examined by the survey crew. Thus the 1956 spring salmon run in Butte Creek is calculated to number 3,000 fish. It was reported that a few fall run salmon were spawning near the downstream limits of the gravel riffle areas late in the season. There was no opportunity to check this report.

Feather River

The fall salmon run in the Feather River was smaller than the runs of recent years. The bulk of the run spawned on the riffles from Gridley upstream to Sutter Butte Dam. The spawning areas between the mouth of Honcut Creek and Gridley were lightly utilized, as were the riffles between Sutter Butte Dam and Oroville.

Exceptionally favorable conditions for carcass recovery persisted throughout the 1956 salmon spawning season. With one of the driest winters on record, river flows remained low and stable and the water was exceptionally clear.

In spite of ideal weather and an intensive patrol of the river, only 1,983 carcasses were recovered. This is only one-fourth the number counted in 1955. From the dead salmon recovery data it is calculated that 18,000 salmon spawned in the Feather River below Oroville. The following table shows the distribution of the salmon population by river section.

<u>River Section</u>	<u>No. Dead Salmon</u>	<u>Estimated Population</u>
Oroville to Sutter Butte Dam	315	3,000
Sutter Butte Dam to Gridley	1,263	12,000
Gridley to Live Oak	322	<u>3,000</u>
	Total	18,000

In the West Branch of the Feather a total of 33 dead salmon was counted. It is estimated that a population of 200 salmon spawned in this tributary. Flows were very low throughout the season and most of the fish spawned only a short distance from the mouth of the stream.

As in the past it was impossible to gain much information from dead salmon recovery on the numbers of salmon frequenting the Middle and North Forks of the Feather. From redd counts and counts of live fish it is estimated that between 1,000 and 2,000 spring run salmon spawned in the Middle Fork. However, there was evidence that many anglers had fished for spring salmon in this rugged canyon during the summer of 1956 and reports from local sources indicated that these fishermen enjoyed considerable success. Thus the spawning population represented an unknown portion of the actual run which ascended the Middle Fork in the spring.

Only a few fall run fish were seen in the Middle Fork and these were in the lower reaches of the stream.

The North Fork supported a small spring run in the Big Bend section between the Intake Dam and the Los Plumas power house. Seven dead fish were recovered and 46 live salmon were counted in this section.

No spring run or fall run salmon were found in the South Fork. Flows here were extremely low.

Yuba River

The Yuba River had sufficient flow to enable the 1956 fall salmon run to ascend the stream without difficulty. Most of the run spawned upstream from Daguerre Point Dam; however, even in this section the extensive riffle areas were very lightly populated.

Favorable weather and water conditions enabled the survey crew to cover the river effectively. A total of 455 carcasses was counted. The run is estimated to number 5,000 salmon.

American River

The 1956 fall salmon run in the American River was one of the smallest on record. Only 1,537 salmon entered Nimbus Hatchery during the season. A small number of salmon either migrated past the hatchery before the racks were in place or managed to squeeze between the pickets once the racks were installed. The hatchery crew removed 337 dead salmon from the upstream face of the racks. It is estimated that the total salmon population between the racks and Nimbus Dam numbered 400 fish.

Carcass recovery work in the American River between Nimbus Dam and Sacramento was carried on during a period of ideal weather and water conditions. The spawning area was covered ten times by the survey crew from mid-October to mid-December--the most intensive survey in the past ten years.

The dead salmon count totaled 1,580. The entire run which spawned naturally in the river downstream from the Nimbus racks is estimated at 4,500 salmon. The following table shows the distribution of salmon in the American River in 1956.

<u>Place</u>	<u>No. Salmon</u>
Nimbus Hatchery	1,537
River between racks and Nimbus Dam	400
River between racks and Sacramento	<u>4,500</u>
Total 1956 run	6,437

Cosumnes River

The flows in the Cosumnes River during the fall of 1956 were barely sufficient to support a salmon run. Light run-off following rain storms in late October did give the salmon run temporary access to the spawning gravels upstream from Sloughouse. By November 7, spawning was underway.

The spawning areas in the Cosumnes were patrolled six times between November 14 and December 17. In the section of stream from Michigan Bar to Bridgehouse 194 carcasses were recovered. From Bridgehouse to Sloughhouse the carcass count was 61. It is estimated that approximately 20 percent of the run was examined by the survey crew. Thus the total population is calculated to be 1,200 salmon.

Mokelumne River

The size of the salmon run in the Mokelumne River was determined by counting the fish as they passed through the fishway at Woodbridge Dam. An experienced fish counter was assigned to this station on September 26 to prepare the counting house and trapping facilities for the season and to conduct the counting operation. The first salmon entered the ladder on October 7.

Salmon utilized the newly constructed high ladder until November 8, when the Woodbridge Irrigation District removed the boards from the Dam. After that date the fish used the low level ladder to get past the barrier.

The salmon run experienced no difficulty in ascending the Mokelumne River during the 1956 season. Flows were ample, there was no evidence of pollution and the fishways at Woodbridge Dam functioned perfectly. Yet in spite of favorable conditions the salmon run was pitifully small. Only 474 salmon and 13 steelhead were counted between October 7 and December 18 (Table 1). The run dribbled into the ladder throughout the entire counting season. The highest daily count was 18 salmon and 1 steelhead.

During the 1956 season the survey crew attempted to determine the distribution of the spawning salmon in the Mokelumne River with reference to the Comanche Dam site. This proved to be a futile undertaking since there were too few salmon in the run to provide adequate distribution data.

On November 19, the fish counter discovered that large numbers of young steelhead were migrating downstream through the ladder. He was able to capture some of these fish in the trap in the ladder even though the device was designed solely for stopping adult fish moving upstream. From November 19 until December 18, when the counting station was closed, the trap was raised at frequent intervals. On every occasion from 6 to 15 steelhead would be stranded on the trap floor. The number of steelhead that escaped through the pickets in the gates during the trapping operation far exceeded the number captured. The young steelhead ranged in size from 4-1/2 to 6-3/4 inches fork length.

Stanislaus River

The major part of the small salmon run which ascended the Stanislaus River in 1956 spawned on the riffles between Lover's Leap and Knights Ferry. A small segment of the run migrated further upstream to spawn at Two-Mile Bar. Only a few fish utilized the riffles between Lover's Leap and Riverbank.

The concentration of the run in the upper section of the spawning area could well have been the result of the heavy silt load in the lower river. This unfavorable condition was caused by a large scale gravel extraction

TABLE I

MOKELUMNE RIVER
WOODBRIDGE FISH COUNTING STATION RECORD
1956

	No. King Salmon	No. Steel- head		No. King Salmon	No. Steel- head		No. King Salmon	No. Steel- head
October 1			November 1	12		December 1	3	
2			2	5		2	4	
3			3	9		3	3	
4			4	9	2	4	6	
5			5	4		5	16	
6			6	11		6	6	
7	1		7	15		7	11	
8	3		8	7		8	7	
9	2		9	18	1	9	4	
10	5		10	17		10	1	
11	1		11	3		11	3	
12	1		12	5		12	2	
13	3		13	18		13	1	
14	1		14	11		14	5	
15	0		15	10		15	3	
16	1		16	12		16	1	
17	10		17	7	1	17	1	
18	12	1	18	9	1	18	2	
19	6		19	3				
20	11	2	20	3				
21	8		21	4				
22	7		22	2				
23	15	1	23	2				
24	17		24	2				
25	10		25	4				
26	4	1	26	2				
27	7		27	6				
28	6	3	28	6				
29	10		29	7				
30	14		30	4				
31	13							
Totals	168	8		227	5		79	0

Total King Salmon - 474

Total Steelhead - 13

operation near Lover's Leap. Here heavy equipment was busy throughout the spawning season removing gravel from the stream bed and from the adjoining flood plain. In addition to the silting of the stream this activity completely destroyed a number of important spawning riffles. At Orange Blossom Bridge, several miles below the source of pollution, an improvised secchi disc disappeared from view two inches under the water surface. This condition was brought to the attention of Region IV and headquarters of the Department of Fish and Game in the hope that action could be taken to alleviate the pollution.

Intensive coverage of the Stanislaus River during the spawning season resulted in the recovery of 955 carcasses. The entire run is estimated to number 5,000 salmon.

Tuolumne River

Flows in the Tuolumne River during the salmon spawning season were adequate, although daily fluctuations in releases from the powerhouse at La Grange Dam were not conducive to efficient spawning. Weather conditions were ideal for the salmon survey, making it possible to cover the spawning area thoroughly. Seven trips were made on each of the three river sections (La Grange to Frog Ponds, Frog Ponds to Roberts Ferry and Roberts Ferry to Waterford) during which 769 carcasses were picked up. It is estimated that the total salmon population in the Tuolumne River numbered 5,500 salmon.

Merced River

The 1956 Merced River salmon run was a complete failure. Although the flow during the normal spawning season was little more than a trickle, it probably would have been possible for salmon to thrash their way over the shallower riffles and ascend the river at least as far as the beaver dams above Shaffer Bridge. Only two dead salmon (both males) were found in this stream and these were recovered a short distance above Cressey. No redds were seen anywhere in the river. The algae on the gravel riffles was disturbed only by the survey crew dragging the skiff from one pool to the next.

Until additional water storage facilities are developed on the Merced River to provide more flow during the fall and winter months, little can be done to rehabilitate the salmon runs in this stream.