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KING (CHINOOK) SALMON SPAWNING STOCKS IN CALIFORNIA'S CENTRAL VALLEY, 1965 <sup>1/</sup>

by

MARINE RESOURCES BRANCH and REGIONS 1, 2, and 4

Edited by  
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SUMMARY

During 1965, the California Department of Fish and Game conducted its thirteenth annual king (chinook) salmon, O. tshawytscha, spawning stock inventory of the Sacramento-San Joaquin River System.

Counts of salmon carcasses, live fish, and redds were used as bases for spawning estimates. Counts and estimates were of fall-run salmon, although a few spring-run fish were included, some in separate counts and some unavoidably mixed with fall fish. No estimates of winter-run salmon were made.

During 1965, an estimated 199,000 (199,378) king salmon spawned in the Sacramento-San Joaquin River System as compared with an estimated 323,000 fish in 1964. Of these, 192,000 (96 percent) spawned in the Sacramento River and its tributaries from the American River north.

King salmon counts and population estimates for the Sacramento-San Joaquin River System were as follows:

Sacramento, Main Stem	103,376
Northern Sacramento River Tributaries (North of Chico Creek)	14,389
Southern Sacramento River Tributaries (Chico Creek and South)	73,992
San Joaquin River Tributaries (Including the Mokelumne and Cosumnes Rivers)	<u>7,621</u>
Total	199,378

(Complete report available upon request.)

# KING (CHINOOK) SALMON SPAWNING STOCKS IN CALIFORNIA'S CENTRAL VALLEY, 1965

Marine Resources Administrative Report No. 66-6

Edited by  
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## INTRODUCTION

This report covers the thirteenth annual Central Valley king (chinook) salmon (Oncorhynchus tshawytscha) spawning stock inventory. Estimates and counts were principally of fall-run stocks. For a few streams, separate spring-run salmon stock estimates were included. Spring-run salmon were included in fall-run estimates for the Upper Sacramento River and areas of the Feather River where an overlap in spawning period made it impractical to separate fall- and spring-run stocks. Winter-run salmon start entering the Upper Sacramento River just as the survey ends. These fish are confined to the main stem of the Sacramento River. The winter-run spawning period extends from April into July, so no estimate was made of their number, and few if any were included in the counts. In 1965, the total spawning stock estimate of fall-run king salmon in the Central Valley was 199,000 (199,378) which was considerably below last year's estimate of 323,000 fish.

## ACKNOWLEDGMENTS

We wish to take this opportunity to acknowledge the excellent work done by Messrs. Charles Young, Fisheries Manager I in Region 2, and William Hodges, Fish and Game Seasonal Aid, Region 1. They have been conducting the Salmon Spawning Stock Surveys over the past several years in their regions. Their knowledge of the river, interest in the surveys, and willingness to work long hours under unfavorable conditions have contributed immensely to the continuity and over-all success of these surveys.

## METHODS

Most population figures were obtained by counting dead salmon and estimating what percentage of the run was counted -- same method used in past inventories. Factors such as flow, turbidity, and number of counting trips, which would affect each estimate, were applied as dictated by past controlled tests.

Carcasses were examined for fin marks, tags, sex and completeness of spawning, and were then cut in half to prevent recounting them on subsequent trips. Aerial counts of redds were a basis for population estimates in some stream sections. Additional counts were made at fishways, hatcheries, and egg collecting stations.

Regions 1, 2, and 4 conducted all surveys. Marine Resources Branch served as liaison between Regions to assure uniformity of methods. The Branch also compiled all pertinent results into this annual report. Spawning stock surveys were conducted by 12 Department of Fish and Game personnel as follows: Region 1, four; Region 2, six; and Region 4, two. This does not include personnel at counting stations.

MAIN STEM OF SACRAMENTO RIVER  
(Figure 1 and Table 1)

by

KENNETH GALLAGHER and MILLARD COOTS - Region 1

This survey began October 4, 1965 and ended January 13, 1966.

Fall Run

During the survey period, water releases from Keswick Dam were higher than normal. Flows were 8,000 cfs at the beginning of the survey and were gradually increased to 15,000 cfs by the end of the survey period. Carcass recovery conditions were comparatively poor due to high water releases and turbid stream conditions. Many of the recoveries were floating carcasses. The peak of the spawning occurred in the first two weeks of November. Only a few spawners were noted by the end of December.

The flashboards at the Anderson and Cottonwood Irrigation Diversion Dam were removed on November 29, 1965; the fishway over the dam was also opened at this time. We believe the fall-run spawning escapement in the main stem of the Upper Sacramento River was somewhat less than the 1964 escapement. This was especially true on the "Redding Riffle" which appeared to have about 50 percent normal utilization.

There were 2,622 salmon carcasses examined on the main stem Sacramento River between Keswick Dam and Squaw Hill Bridge. The estimated number of spawners was 103,000 (103,376); this includes 2,976 fish trapped at Keswick Dam and spawned at Coleman Hatchery.

Spring Run

No separate estimate of the spring run was made. An unknown but small number of spring-run fish may have been included in the fall-run count.

SACRAMENTO RIVER TRIBUTARIES NORTH OF CHICO CREEK  
(Figure 1 and Table 2)

by

TERRY HEALEY and KEN GALLAGHER - Region 1

The survey period was from October 11, 1965 to January 13, 1966.

Clear Creek

Fall Run

Salmon spawning activity was first observed in Clear Creek on November 3, 1965. However, it looked as though spawning probably started during the last week of October. The peak of spawning was believed to have occurred near the end of November.

Illegal fishing activity has become an extremely serious problem in Clear Creek. Increased law enforcement efforts are needed to correct this problem. Gravel removal is another problem which, over a period of several years, has been responsible for serious losses of spawning habitat in the lower three miles of stream.

During the last two years, we have received cooperation from the Oaks Gravel Company to prevent losses of eggs and fry from untimely operations of heavy equipment in the stream. They have complied with our recommendations to refrain from operating in certain areas from time of spawning until the fry are out of the gravel. Problems resulting from their work include fording the stream with heavy equipment in riffle areas, temporary relocation of the stream channel, and the direct loss of spawning habitat due to the actual removal of gravel from the streambed.

This was the second year in which there has been a controlled flow release below Whiskeytown Dam. The natural flow from tributary streams below Whiskeytown Dam such as Paige Boulder Creek and South Fork begin to contribute significant amounts of water to the stream after the first fall rains. This combination of controlled flow and natural flow increment below the dam appears to be adequate for maintaining the salmon run at the preproject level. The peak of spawning activity has been taking place when the flow is from 200 to 300 cfs, and the minimum flow during the spawning period has been about 150 to 175 cfs.

Regional personnel made several inspections of the tunnel-type fishway at McCormick-Saeltzer Dam but there was no indication that fall-run salmon had used it this season. The salmon did not concentrate at the fish entrance to the ladder. However, a large number of salmon spawned in the first riffle downstream from this entrance which is about 300 yards distance.

On January 27, 1966, one adult salmon was observed in the fish exit of the ladder. On January 28, 1966, a ground survey was made of the eleven-mile stretch of Clear Creek between Whiskeytown and McCormick-Saeltzer dams. No salmon were seen although visibility was good.

It appears that most of the sections of Clear Creek substrate has deteriorated since the 1956 stream survey was made. Much of this deterioration is due to gravel removal and build-up of decomposed granite sand which is presently not being removed by flushing flows.

Two survey trips were made and 843 carcasses examined. An estimated 2,500 fall-run salmon spawned in the lower seven miles of Clear Creek below the McCormick-Saeltzer Dam.

#### Spring Run

None.

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## Cow Creek

### Fall Run

Salmon spawned in many sections of the Cow Creek drainage including Main Cow, South Cow, Old Cow, Clover, Oak Run, North Cow, and Salt Creeks.

Prolonged rains allowed salmon to enter Cow Creek in early November, but turbid water conditions prevented surveys and observations being made until the end of November. An aerial observation of Cow Creek and South Cow Creek to the powerhouse was made on November 29. On this trip, spawners were noted on the first riffle above the confluence of Cow Creek with the Sacramento River. Only 55 carcasses were seen from the air and spawning activity appeared to be almost completed.

Ground surveys were made in the first half of December. During these surveys, 76 live fish were noted. Approximately 19 stream miles of the drainage were surveyed which included 8 miles of South Cow Creek and 2 miles of Cow Creek.

Two survey trips were made and 168 carcasses were counted. The total run was estimated at 1,000 fish.

### Spring Run

None.

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## Bear Creek

### Fall Run

Adequate flows during November enabled the spawners to migrate farther upstream than usual.

On November 29, an aerial survey was made covering the stream section from Highway 44 Bridge to the Sacramento River. During this flight, eight live salmon, six carcasses, and twenty redds were counted.

The first ground survey in Bear Creek was made on November 22 from Dersch Bridge to the Sacramento River, a distance of about four stream miles. Nine live salmon were counted. Another ground survey was made during the period December 6 to 16 for a distance of about nine stream miles. This was from approximately 1.5 stream miles above Highway 44 Bridge downstream to Parkville Road Bridge. Spawning activity was well-distributed in the area, and 13 live salmon and 72 redds were counted.

During the two survey trips on Bear Creek 59 carcasses were examined. The total run was estimated at 350 fish.

### Spring Run

None.

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## Cottonwood Creek

### Fall Run

High and turbid water prevented ground observations from being made until December. During the first half of December, about seven miles of the creek were surveyed, but by this time spawning activity had been completed. Reliable reports indicated that a few fall-run salmon entered Cottonwood Creek prior to the first heavy rains in early November.

Based on an aerial observation on November 29, spawning took place in most sections of the accessible portions of Cottonwood Creek with the South Fork containing the largest run. However, trapping of downstream migrants indicated that the best hatch occurred in the North Fork. Out-migration continued into June.

One survey trip was made on Cottonwood Creek and 23 carcasses were recovered. An estimated spawning population of 900 fish was based on aerial observation and a ground survey.

### Spring Run

No estimate.

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## Battle Creek

### Fall Run

Carcass recovery conditions were excellent in Battle Creek this season with generally constant flows and clear water. Flood control work was conducted by the Corps of Engineers in the spring of 1965. The work consisted of straightening the channel and clearing vegetation. This work has made about three miles of the stream into an almost continuous riffle. As far as we could determine, this project did not harm king salmon production potential. Salmon have been observed spawning in this area without apparent preference to individual areas.

During November and December, only 56 steelhead anglers were counted on seven weekday survey trips. This is below normal use for this time of year and we believe that the removal of pools and vegetation may have affected steelhead fishing effort.

One marked fish, D-1M, was recovered. This 40-inch ripe female was planted as a fingerling in Mill Creek in the spring of 1963.

Twelve survey trips were made on Battle Creek, and 2,376 carcasses recovered. The run was estimated to be 9,000 (9,194) salmon including 3,194 fish taken at Coleman Hatchery.

### Spring Run

No estimate.

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## Paynes Creek

### Fall Run

On November 19, a ground survey was made from about 3 miles above to about 4 miles below Dales Station. No carcasses were recovered, but three live salmon were observed. The run was estimated to be 35 fish.

### Spring Run

No estimate.

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## Antelope Creek

### Fall Run

Antelope Creek was observed from the air on November 29. Eight live salmon and one carcass were counted upstream from the Cone Grove Dam and three live salmon below the dam during this survey.

On December 10, a ground survey was made from the Cone Grove Dam downstream for about 2.5 miles. Recovery conditions were good.

During the one survey trip on Antelope Creek 13 carcasses were recovered. The run was estimated to be 60 fish.

### Spring Run

No estimate.

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## Mill Creek

### Fall Run

Recovery conditions were good. Precipitation which began on the 12th of November provided good flows for spawning throughout the remainder of the season.

One aerial observation was made on the 29th of November. Five carcasses and three live fish were observed on this flight, all below Clough Dam. The spawning escapement was low again this season.

Three survey trips were made on Mill Creek and nine carcasses recovered from Clough Dam to the mouth which is approximately 4.5 miles. The Mill Creek run was estimated to be 150 fish.

### Spring Run

No estimate.

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## Deer Creek

### Fall Run

Recovery conditions were good most of the season. Ground surveys were made from the old fish weir downstream to the mouth, a distance of about 5.5 miles.

An aerial observation was made on November 29 from the upper diversion dam downstream to the mouth, and five live salmon and five carcasses were counted.

Two survey trips were made on Deer Creek and 30 carcasses recovered. The run was estimated to be 200 fish.

### Spring Run

No estimate.

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## SACRAMENTO RIVER TRIBUTARIES, CHICO CREEK AND SOUTHWARD (Figure 2, Table 3)

by  
WILLIAM WHITE - Region 2

The spawning stock survey was carried out on the Sacramento River tributary streams from Chico Creek, south, from September 19, 1965 to January 26, 1966.

### Chico Creek

#### Fall Run

No estimate was made.

#### Spring Run

One survey trip was made, conditions were very good. The water was clear and low. As usual, most of the fish were seen in the upper spawning area of Higgins Hole (near Ponderosa Way). The population of spring-run salmon in Chico Creek was estimated to be 50 fish. This estimate was based on counts of live fish.

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### Butte Creek

#### Fall Run

None.

#### Spring Run

The peak of spawning occurred about the beginning of the fourth week in September. One aerial and one ground survey was made. Based on these surveys, the population was estimated to be 1,000 fish.

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## Feather River

### Fall Run

There were 3,635 fall-run salmon transported above Oroville Dam from the Feather River Hatchery Interim Facility. Nine survey trips were made in the area below the fish barrier dam and 979 carcasses recovered. An estimated 19,600 salmon used the spawning area from the fish barrier dam downstream to Honcut Creek. The fall-run was estimated to be 23,200.(23,235) fish.

### Spring Run

The spring-run consisted of 738 fish trapped at the Feather River Hatchery Interim Facility and transported above Oroville Dam.

The total of the Feather River spring- and fall-runs was estimated to be 24,000 (23,973) fish.

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## Yuba River

### Fall Run

Eight survey trips were made on the Yuba River and 887 carcasses recovered from an estimated spawning population of 10,200 fish.

### Spring Run

No estimate was made.

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## American River

### Fall Run

The number of carcasses recovered from Nimbus Racks to Watt Avenue Bridge was 4,941, and the estimated spawning population was 20,600 fish. Above Nimbus Racks, 3,495 carcasses were recovered. The run in this section was estimated to be 4,400 fish. Adding the 13,569 fish that entered Nimbus Hatchery to the above estimates, the total American River run was estimated to be 38,600 (38,569).

### Spring Run

No estimate made.

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## Other Tributaries - Chico Creek, South

### Tributaries to Natomas East Drain and Natomas Cross Canal

The salmon inventory crew surveyed Secret Ravine, Miners Ravine, Antelope Creek, Auburn Ravine, Doty Ravine, and Coon Creek. The run in Secret Ravine and Auburn Ravine was smaller than in 1964; the other showed a proportional drop.

Four survey trips were made, no carcasses and only a few redds were observed. Based on these surveys, the estimated population in these streams was 200 fish.

Spring Run

None.

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LOWER SAN JOAQUIN RIVER TRIBUTARIES  
(Figure 3 and Table 4)

by

WILLIAM WHITE - Region 2

The survey period was from December 2 to 24, 1965.

Cosumnes River

Fall Run

Four survey trips were made from Michigan Bar Bridge downstream to Meiss Road Bridge, and 119 carcasses recovered from an estimated spawning population of 800 fish.

Spring Run

None.

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Mokelumne River

Fall Run

The main fishway over Woodbridge Dam was inoperable during the 1965 season. Luckily, the water was high throughout the upstream migration period which made it possible to operate the old fishway on the right bank of the dam.

Counting was carried out on a part-time basis from October 4 to November 12. During this period, 265 fish were tallied through the old fishway. After November 12, when the flashboards were removed, fish were able to negotiate the dam without going through the fishway.

Based on the partial count at the Woodbridge Dam, the run was estimated to be 1300 fish.

Spring Run

None.

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## UPPER SAN JOAQUIN RIVER TRIBUTARIES

(Figure 3 and Table 4)

by

JERRY GOERTZEN - Region 4

The survey period was from November 1, 1965 to January 14, 1966.

An attempt to rebuild the salmon run in the Upper San Joaquin River tributaries was begun in 1964. Various methods of capturing adult salmon were tried in the Tuolumne and Stanislaus Rivers. The plan was to capture salmon for spawning and raise their progeny to yearling size in a hatchery for restocking in the Stanislaus, Tuolumne, and Merced Rivers. The methods were not very successful as only 15 males in the Tuolumne River and 1 female and 8 males in the Stanislaus River were captured. From this one female, 4,556 eggs were taken which resulted in 2,788 fish being raised to sub-yearling size. On November 24, 1965, these fish, which weighed 4.2 per ounce, were planted in the Merced River at Shaffer Bridge.

In 1965 a weir was built across the Stanislaus River just below Orange Blossom Bridge for trapping adult salmon. Trapping began on October 12 and ended on November 10, 1965. During this period, 72 males and 59 females were trapped. Forty-two females survived to be spawned. The 42 females produced 213,480 eggs for an average of 5,083 eggs per female.

Other attempts to rebuild the run include planting of 1,267,110 eyed eggs in the Merced River near Shaffer Bridge in December of 1964. These eggs were received from Nimbus Hatchery on the American River. In December, 1964, 6,670,400 green eggs from Nimbus Hatchery were sent to San Joaquin State Fish Hatchery for hatching. These eggs and resulting fish were distributed as follows: In January, 1965, 2,016,000 were transferred from San Joaquin to Moccasin Creek Hatchery, and 960,000 eyed eggs returned to Nimbus. Between March 23 and April 12, 1965, 1,032,370 fingerlings from Moccasin Creek were planted in the Tuolumne River near Waterford. The size ranged from 71.0/oz. to 85.0/oz. Between March 25 and May 17, 1965, 945,665 fingerlings from San Joaquin Hatchery were planted in the Stanislaus River at Riverbank. The size ranged from 35.0/oz. to 88.0/oz. Also, on April 7, 1965, 77,000 fingerlings weighing 77.0/oz. from Moccasin Creek Hatchery were planted in the Stanislaus River at Knights Ferry. Altogether, the Stanislaus River received 1,022,665 fingerling salmon in 1965. Also, between April 27 and May 11, 1965, 922,960 fingerlings from San Joaquin Hatchery were planted in the Merced River at Shaffer Bridge. The size ranged from 48.0/oz. to 75.0/oz.

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### Stanislaus River

#### Fall Run

The Stanislaus River was surveyed before the Tuolumne River because the salmon entered the Stanislaus River earlier this year. On the last week of October, we observed salmon spawning as far upstream as Knights Ferry. On the first survey period, (November 1 - 4, 1965), most of the salmon were still on their way upstream. While the trap was in operation, (October 13 to November 10), we saw many

more fish in the area below the trap than there normally would be, but we failed to find any concentrations of salmon. Once the high murky flows started, we could not make accurate live fish or redd counts, but we did see active spawning as late as the middle of December.

The flow was 75 cfs at Orange Blossom Bridge prior to October 18, 1965. After this it was increased to 430 cfs, which continued until about the middle of November. For most of the remainder of the season the flow was between 800 - 900 cfs. By the last survey it had been increased to 1,723 cfs. The visibility was good on the first run, but heavy rain made the river murky for the remainder of the season. The visibility was poor all season below Standard Materials at Oakdale because of their gravel operation in the river.

There was some poaching in the Stanislaus River this season, but by the middle of November, the high water discouraged most of the illegal fishermen. The loss to poachers was minor during this season.

The flood waters of last winter, (December, 1964), which reached a peak of 40,000 cfs, changed some of the river channel and washed out much of the algae and other water plants in the upper spawning area of the stream. This plant growth is still a problem in the lower spawning area. High water washed out some of the large trees, but did not disturb the small willows and alders. We had to chop out quite a few fallen trees to get the boat down the river on the first run. After that, the county employees removed the trees from the river channel and many along the riverbank. The flood washed away much of the gravel from the riffles in the upper half of the spawning area, leaving only big boulders on bedrock.

Five survey trips were made on the Stanislaus River and 102 carcasses recovered from an estimated run of 2,231 fish, which includes 131 fish trapped at the weir near Orange Blossom Bridge.

#### Spring Run

None.

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### Tuolumne River

#### Fall Run

The salmon run started by October 19. We noted good spawning activity on our first survey of the river, but many of the fish were still moving upstream. The heaviest spawning at that time was in the lower two sections, but later in the season the heaviest spawning seemed to be upstream from Rairden's Farm. We could not make a good count of live salmon or redds after the high murky flows started. High flows probably flushed some carcasses downstream. The carcass recovery was more successful on the last two trips when the river dropped to 1,500 cfs.

The flow was 2,000 cfs at La Grange on October 19, 1965. The next week it dropped to 650 cfs, but by the time we started the survey on November 8, it was back up to 1,500 cfs. By the end of December, the flow was gradually increased to 3,000 cfs. The flow fluctuated daily. Visibility was fair on the first run, but heavy rain made the river very murky for the remainder of the season. Heavy silting of the river was caused by the new Ruddy Rock plant at the Roen Ranch (two miles upstream from the Reed Rock plant) (Figure 3).

Willows and alders growing in the spawning riffles still present a major problem in the Tuolumne River. The high water during last December's flood had no effect on these trees. Some algae and water plants were washed away, but there is still an abundance of both. There was no evidence of water hyacinths in the spawning area.

We saw no signs of poaching probably because of the high murky water.

Six survey trips were made on the Tuolumne River, and 120 carcasses examined from an estimated run of 3,200 fish.

#### Spring Run

None.

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### Merced River

#### Fall Run

The salmon run apparently started the last week of October or the first week of November, 1965. On our first complete survey of the river, (November 11 - 12, 1965), spawning was just starting. Spawning was completed by the first of December; we saw no further spawning activity after this date. The redds were not identifiable after the high flows, and carcasses were difficult to locate after the water receded. Most of the spawning took place upstream from the Shaffer Bridge, but there was no evidence of fish above Cowell Island (about three miles upstream from Shaffer Bridge). There may have been spawning activity in the north channel around Cowell Island after the high water, but none in the south channel.

At the start of the season the water was very low (15 cfs) at Shaffer Bridge. Heavy rain in November started filling Exchequer Reservoir rapidly. This endangered the construction work on the dam making it necessary to release up to 5,000 cfs for a week or so at a time. The first high release was made about the first week of December, 1965, and a second release about the first of January, 1966. Between releases the flow was from 100 to 200 cfs. The water was fairly clear during the low flow period but murky during and shortly after the high flow periods ended. The water was murky throughout the spawning period below the Turlock Rock Company (two miles downstream from Shaffer Bridge), because of their gravel operation in the river.

Algae and water plants are still a problem in most of the spawning area, especially below Shaffer Bridge. The January 1965 flood, and high flows this season, did not wash out water weeds, alders or willows, and did not affect the silt in the gravel.

There was no evidence of poaching in the Merced River this season.

Three survey trips were made on the Merced River and four carcasses examined. Based on live fish, carcass and redd counts, the run was estimated to be 90 fish.

Spring Run

None.

TABLE 1

## FALL-RUN KING SALMON COUNTS AND POPULATION\*

ESTIMATES FOR THE MAIN STEM OF THE SACRAMENTO RIVER, 1965

<u>River Section</u>	<u>Stream Miles</u>	<u>Number of Counting Trips</u>	<u>Number of Carcasses &amp; Skeletons Counted</u>	<u>Estimated Spawning Population</u>
Keswick Dam Fish Trap	-	-	-	2,976**
Keswick Dam to A.C.I.D. Dam	4.5	0	0	400
A.C.I.D. Dam to Hwy. 44 Bridge	4.0	11	674	25,000
Hwy. 44 Bridge to Upper Anderson Bridge	10.5	11	816	40,000
Upper Anderson Bridge to Ball's Ferry***	8.0	10	930	13,000
Ball's Ferry to Jelly's Ferry	9.5	10	133	15,000
Jelly's Ferry to Bend Bridge	8.5	4	6	4,000
Bend Bridge to Red Bluff	12.0	4	42	1,500
Red Bluff to Tehama Bridge	15.0	3	21	1,000
Tehama Bridge to Squaw Hill Bridge	<u>14.5</u>	3	<u>0</u>	<u>500</u>
TOTAL, SACRAMENTO MAIN STEM	86.5		2,622	103,376

\* A few spring-run fish probably were included in the estimates.

\*\* Trap Counts. This count includes fish taken from November 15, 1965, to February 23, 1966.

\*\*\* Many of these carcasses were recovered after they drifted down into an eddy area in the river.

TABLE 2

KING SALMON COUNTS AND POPULATION ESTIMATES  
NORTHERN SACRAMENTO RIVER TRIBUTARIES (NORTH OF CHICO CREEK)

1965

<u>Stream or Stream Section</u>	<u>Number of Counting Trips</u>	<u>Carcasses and Skeletons Counted</u>	<u>ESTIMATED SPAWNING POPULATION</u>		
			<u>Spring Run</u>	<u>Fall Run</u>	<u>Total Run</u>
CLEAR CREEK	2	843	None	2,500	2,500
COW CREEK	2	168	None	1,000	1,000
BEAR CREEK	2	59	None	350	350
COTTONWOOD CREEK (TOTAL)	3	23	No Est.	900	900
Main Stem	(1)	(3)	No Est.	(100)	
North Fork	(1)	(8)	No Est.	(150)	
Middle Fork	(1)	(12)	No Est.	(250)	
South Fork	(0)	(0)	No Est.	(400)	
PAYNES CREEK	1	0	No Est.	35	35
BATTLE CREEK (TOTAL)		2,376	No Est.	9,194	9,194
Coleman Hatchery	-	-	None	(3,194)*	
BeLow Hatchery	(12)	(2,376)	No Est.	(6,000)	
ANTELOPE CREEK	1	13	No Est.	60	60
MILL CREEK	3	9	No Est.	150	150
DEER CREEK	2	<u>30</u>	<u>No Est.</u>	<u>200</u>	<u>200</u>
TOTAL, NORTHERN SACRAMENTO RIVER TRIBUTARIES		3,521	No Est.	14,389	14,389

\* Trap counts from October 12, 1965, to January 7, 1966.



TABLE 3

## KING SALMON COUNTS AND POPULATION ESTIMATES

## SOUTHERN SACRAMENTO RIVER TRIBUTARIES (CHICO CREEK AND SOUTH)

1965

Stream or Stream Section	Number of Counting Trips	Carcasses and Skeletons Counted	ESTIMATED SPAWNING POPULATION		
			Spring Run	Fall Run	Total Run
CHICO CREEK	1	0	50	No. Est.	50
BUTTE CREEK	2	0	1,000	None	1,000
FEATHER RIVER (TOTAL)		979	738	23,235	23,973
Oroville Fish Trap	-	-	(738)	(3,635)	
Oroville Bridge to Sutter Butte Dam	(9)	(494)	No Est.	(9,900)	
Sutter Butte Dam to Gridley Bridge	(9)	(375)	No Est.	(7,500)	
Gridley Bridge to Honcut Creek	(8)	(110)	No Est.	(2,200)	
YUBA RIVER (TOTAL)		887	No Est.	10,200	10,200
Blue Pt. Mine to Hwy. 20 Bridge	(7)	(127)	No Est.	(2,500)	
Hwy. 20 Br. to Daguerre Pt. Dam	(8)	(329)	No Est.	(4,100)	
Daguerre Pt. Dam to Baldwin Gr. Pl.	(7)	(431)	No Est.	(3,600)	
AMERICAN RIVER (TOTAL)		8,436	No Est.	38,569	38,569
Nimbus Racks to Carmichael Pump	(15)	(4,116)	No Est.	(16,500)	
Carmichael Pumps to Watt Ave. Br.	(14)	(825)	No Est.	(4,100)	
Above Nimbus Racks		(3,495)	No Est.	(4,400)	
Nimbus Hatchery		-	No Est.	(13,569)	
NATOMAS DRAINAGE	4	None	No Est.	200	200
TOTAL, SOUTHERN SACRAMENTO RIVER TRIBUTARIES		10,302	1,788	72,204	73,992

TABLE 4

## FALL-RUN KING SALMON COUNTS AND POPULATION ESTIMATES\*

## SAN JOAQUIN RIVER TRIBUTARIES, 1965

<u>Stream or Stream Section</u>	<u>Number of Counting Trips</u>	<u>Carcasses and Skeletons Counted</u>	<u>Estimated Spawning Population</u>
COSUMNES RIVER Michigan Bar to Meiss Road Bridge	4	119	800
MOKELUMNE RIVER Woodbridge Dam Counting Station	-	-	1,300**
STANISLAUS RIVER Goodwin Dam to Riverbank	5	102	2,231***
TUOLUMNE RIVER La Grange to Reed Rock Plant	6	120	3,200
MERCED RIVER Snelling Bridge to McSwain Bridge	3	<u>4</u>	<u>90</u>
TOTAL, SAN JOAQUIN TRIBUTARIES		345	7,621

\* No spring-run fish entered any of these streams this year.

\*\* Only a partial count was made at Woodbridge Dam prior to November 12, 1965.

\*\*\* This includes 131 fish trapped at the weir near Orange Blossom Bridge and spawned at Moccasin Creek Hatchery.

**TABLE 5**  
**SACRAMENTO-SAN JOAQUIN KING SALMON SPAWNING STOCKS**  
**1953 - 1965**  
(In Thousands of Fish)

<u>Year</u>	<u>Sacramento Valley</u>	<u>San Joaquin Valley</u>	<u>GRAND TOTAL Central Valley</u>	<u>STATUS* (% of Base No.)</u>
1953	513	84	597	119
1954	412	75	487	97
1955	369	31	400	80
1956	153	12	165	33
1957	102	15	117	23
1958	237	46	283	57
1959	421	52	473	95
1960	415	56	471	94
1961	247	2	249	50
1962	252	2	254	51
1963	301	2	303	61
1964	313	10	323	65
1965	192	7	199	40
13-year average	302	30	332	66

Sources: Marine Resources Branch, Salmon/Steelhead Program, Sacramento.

\* Base number is 500,000 fall-run salmon. This quantity will fully utilize available spawning areas. Other runs spawn at different times.

TABLE 6  
 SACRAMENTO-SAN JOAQUIN VALLEY KING SALMON  
 SPAWNING STOCK ESTIMATES, MAJOR STREAMS 1953 - 1965  
 (In Thousands of Fish)

Year	Main Stem Sacramento River (a)	Battle Creek (b)	Butte Creek (c)	Feather River (a)	Yuba River (b)	American River (b)	Cosumnes River (b)	Mokelumne River (b)	Stanislaus River (b)	Tuolumne River (b)
1953	408	16	-	28	6	28	2	2	35	45
1954	276	12	-	71	5	29	5	4	22	40
1955	231	26	1	87	2	17	2	2	7	20
1956	94	21	3	20	5	6	1	0.5	5	6
1957	68	5	2	11	1	8	1	2	4	8
1958	128	29	1	35	8	27	1	7	6	32
1959	267	30	0.5	80	10	31	0	2	4	46
1960	233	24	7	83	20	54	1	2	8	45
1961	149	20	3	41	9	25	-	0.1	2	0.5
1962	139	13	2	19	34	27	1	0.2	0.3	0.2
1963	146	17	5	35	37	41	1	0.5	0.2	0.1
1964	148	16	0.6	41	35	59	2	2	4	2
1965	103	9	1	24	10	39	0.8	1.3	2.2	3.2
AVERAGE	184	18	2	44	14	30	2	2	8	19

- (a) Mostly fall-run.
- (b) Fall-run only.
- (c) Spring-run only.

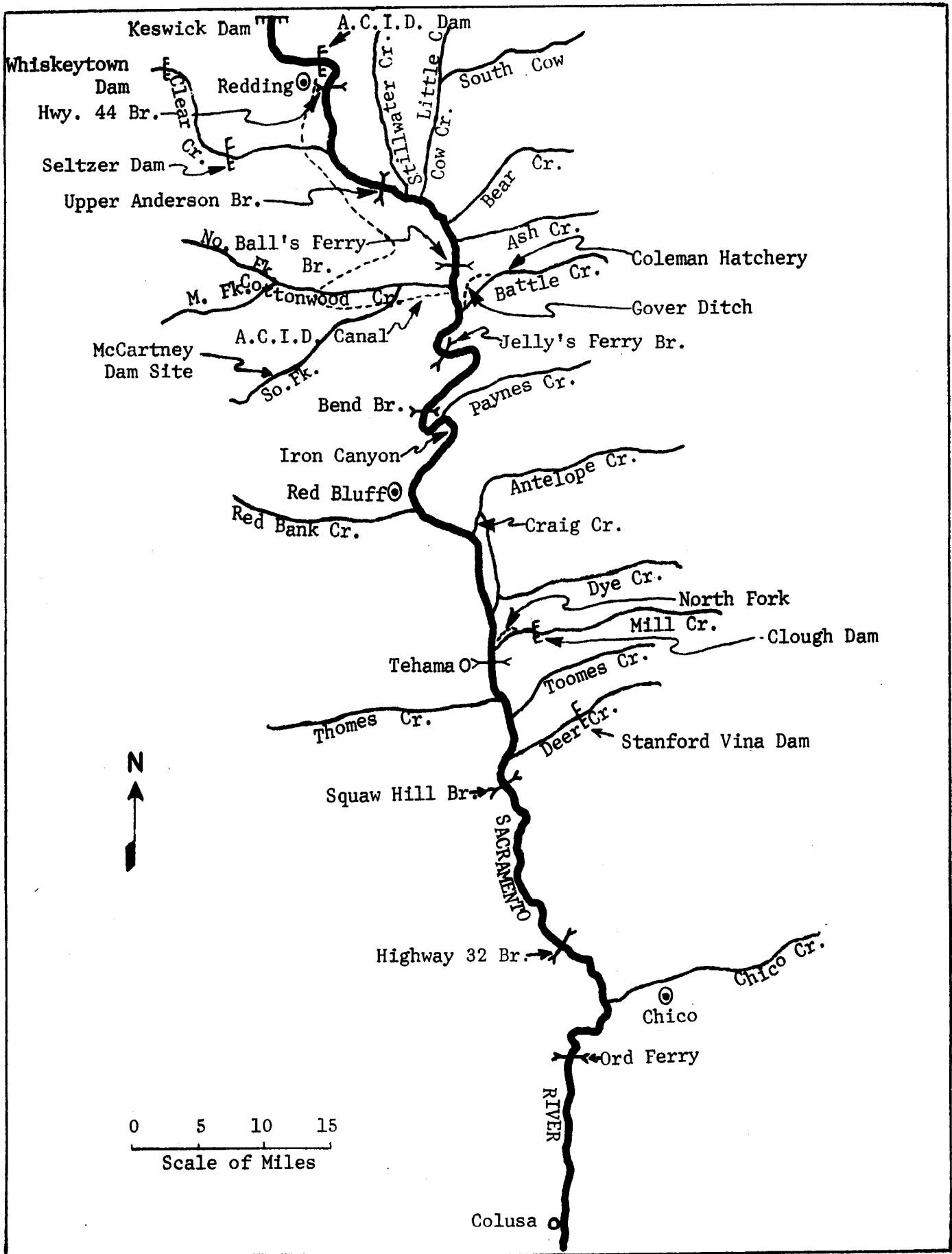


Figure 1. Upper Sacramento River and Tributaries above Chico Creek covered during the 1965 King Salmon Spawning Survey.

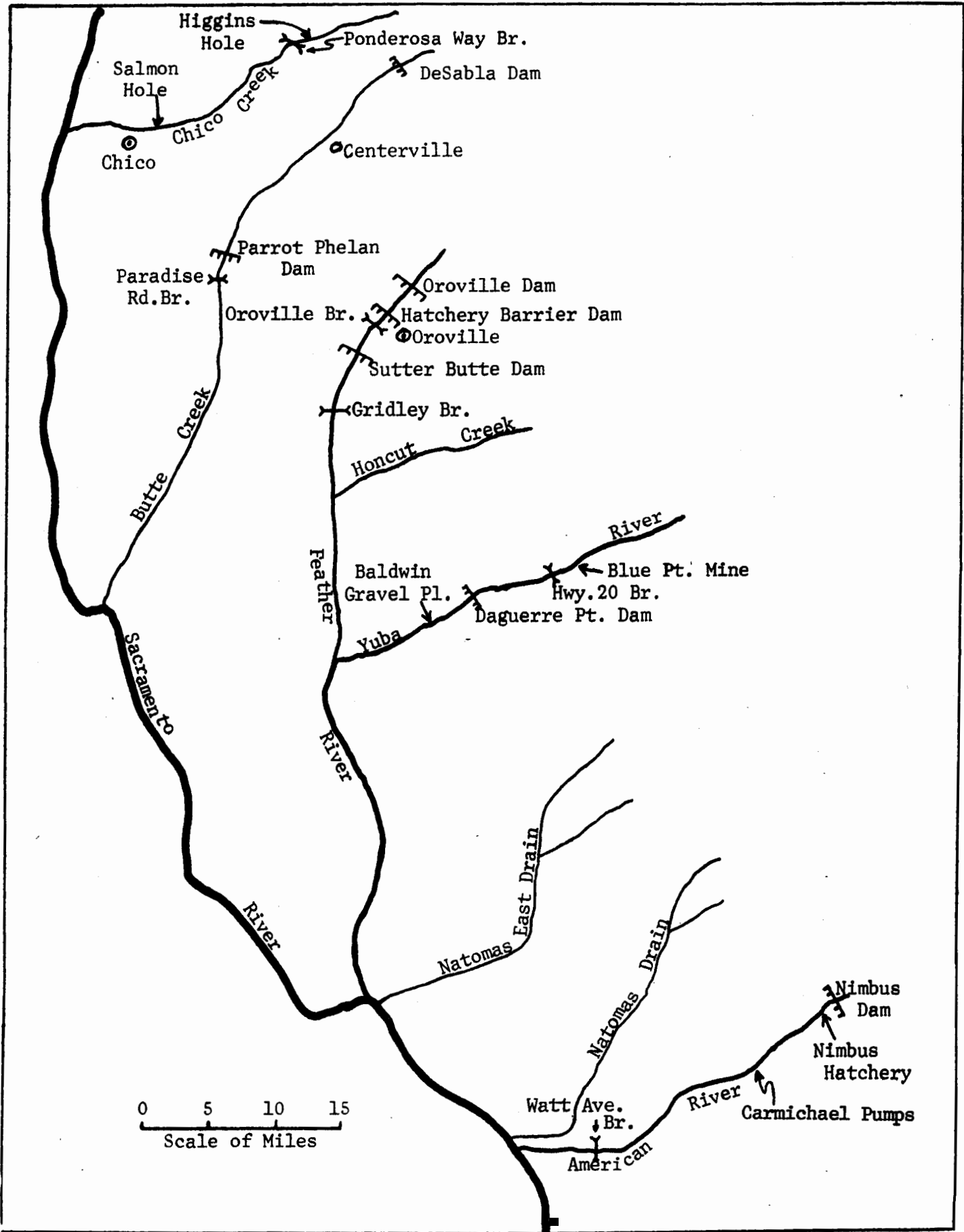


Figure 2. Sacramento River Tributaries from Chico Creek, south, covered during the 1965 Spawning Area Survey.

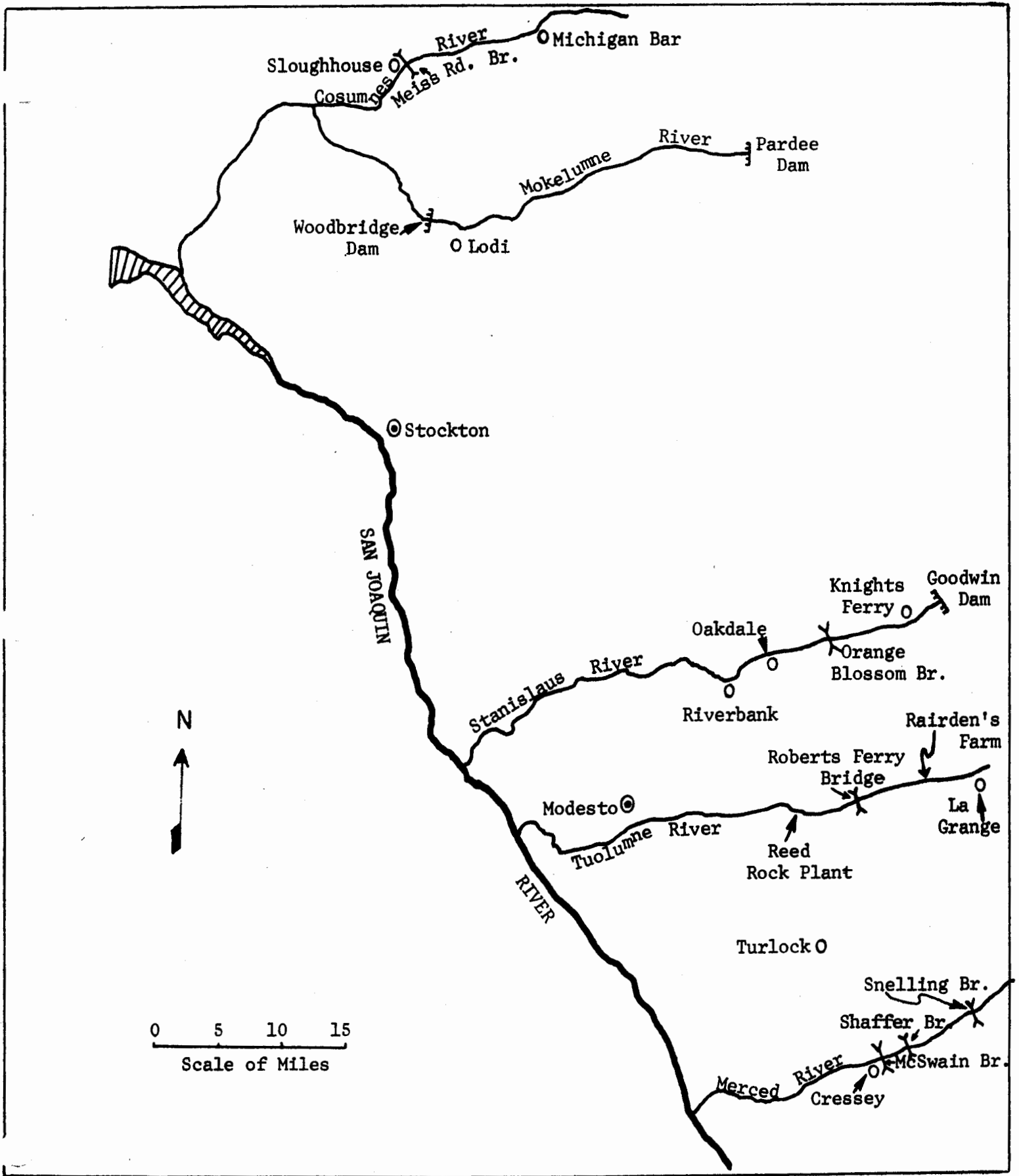


Figure 3. San Joaquin River Tributaries covered during 1965 Spawning Area Survey.