The Shasta River, a tributary of the Klamath drainage system, was chosen as a site suitable to carry on these investigations regarding the king salmon for the following reasons:

1. It is a river of suitable size for investigation and control.
2. It is a representative river of the Klamath system in that usual obstacles, such as irrigation dams, ditches, etc., are found along its course.
3. It is a natural spawning stream of the king salmon, and now the salmon spawn there in considerable numbers.

This report is a preliminary account of the general salmon investigation being conducted on the Shasta River by the California Division of Fish and Game and under the direct supervision of the Bureau of Fish Conservation.

As part of the general investigation the Division has conducted an annual census of the spawning migration of king salmon, Oncorhynchus tschawytscha, in the Shasta River, and this paper is a summary of the data collected during the fall months of 1930 to 1934, inclusive.

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4. No artificial propagation of salmon has been conducted in the Shasta River.

5. The stream is accessible along its entire course.

The Shasta River (fig. 17) originates from Lake Shasta Reservoir and from several large springs located in the upper Shasta Valley, just north of Mt. Shasta. Thence it meanders in a generally northwesterly direction the length of the Shasta Valley until it drops suddenly into the Shasta Canyon, five miles north of the town of Yreka. In the valley the stream, for the most part, is sluggish and for long stretches the bottom is covered with silt and mud. Suitable areas for spawning are found only in the vicinity of Big Springs and in the tributaries known as the Little Shasta River and Parks Creek. In the canyon, however, a considerably different situation is found. Here, the stream is a typical and ideal spawning area in that it possesses gravelly riffles and bars with intermittent waterfalls and deep pools.

As mentioned before, one feature of the salmon investigation is an accurate census of the salmon entering the Shasta River from the Klamath on their spawning migration. For this reason, all fish were allowed to proceed upstream as they entered the mouth of the Shasta.

In order to secure this accurate census of the spawning migrants a counting rack (fig. 20), similar to those used by the United States Bureau of Fisheries, was constructed across the Shasta, just above its confluence with the Klamath.

The construction of this counting rack, as now in use on the Shasta, is as follows: A strongly constructed weir is built across the stream. Built into this weir are two sliding gates which can be raised or lowered to any desired position. Before each gate is placed a broad strip of white canvas or white painted galvanized sheeting. These white aprons are so placed that migrating fish must swim over them, and as they do this the observer can easily distinguish and count the different species as they pass upstream.

By the use of this counting rack an accurate enumeration of migrating fish is made possible. The relative number of grilse or small males, the time and other particulars of the migration are also determined.

During the seasons under discussion (1930-1934), the salmon commenced their migration from the Klamath and up the Shasta, as a rule, during the first two weeks of September. Frequently they appeared considerably in advance of the arrival of fish at the Klamath Big Rock Taking Station, located but a few miles up the Klamath from the junction of the Shasta River. As the season advances, the run increases in a series of higher mounting successive waves until the peak is reached generally between the second and third weeks of October, after which the run decreases rapidly until the end is reached during the latter part of November.

It was interesting to note that most of the fish migrated during the afternoon. But few fish were counted through the gates in the morning, and at night the migration was always at a standstill.

However, it was noticeable that a rise in the stream level, with resultant muddy water, invariably resulted in a sudden rush of salmon into the Shasta from the Klamath, where the fish had been loafing in a large pool just below the confluence of the two rivers.

The magnitude of the spawning migrations or escapements for the years 1930 through 1934 are shown, by weekly totals, in table 1. Upon examination of this table and also of figure 21, it can be seen that the run of 1930 was small, totaling 19,362 fish of which 12,082 or 63.5 per cent were grilse. In contrast to 1930, the migration of 1931 was large, totaling 81,848 kings, 20,037 or 24.45 per cent being young males. Th
It is possible to draw general conclusions from the results of the salmon counts of the salmon movement data. Additional data now on hand have been certified and

TABLE 1
Weekly Movement of King Salmon on the Russian River, 1933-1934