

1894

THE SALMON INDUSTRY.

CALIFORNIA.

*General importance.*—Salmon are the most important fish of California, and their capture and utilization constitute one of the most prominent industries of the State. Among all the fishery products of the State, salmon are surpassed in value only by oysters, whales, and shrimps. All the species of salmon found on the west coast occur in the waters of the State in the proper seasons, but the most abundant, generally distributed, and important is the chinook or quinnat salmon (*Oncorhynchus tshawytscha*). While considerable quantities of salmon are taken each year in Eel River in Humboldt County, and in Smith and Klamath rivers in Del Norte County, the fishing-grounds which give to the salmon fishery the prominence it has attained are the Sacramento River, and Suisun, San Pablo, and San Francisco bays; of these the principal ground is the Sacramento River in Contra Costa and Solano counties.

*Salmon in the Sacramento River.*—The salmon taken in the important fisheries of the lower Sacramento River are either shipped fresh to market or are sold to the canneries located at Benicia, Black Diamond, and Chipps Island. In the quantity and value of the salmon output, the Sacramento ranks next to the Columbia among the rivers of this coast.

The spring run of chinook salmon in this stream usually begins about the middle of April and continues until the middle of May. In 1894, however, the run began earlier and kept up longer than usual; fish were landed at the canneries on April 4, and the supply lasted into June. As late as May 28 the run was very large, over 1,050 salmon being received at one cannery on that date as a result of only half a day's fishing. At the beginning of the season the run was light, and it was predicted that the catch would be smaller than last year, but afterwards the supply increased, and the close of the season witnessed a larger production than for five years.

The weekly close season from Saturday noon to Sunday midnight is generally observed and vigorously enforced, and is, without doubt, one of the most beneficial regulations affecting the fisheries of the State. The concentration of the fisheries in the proximity of the canneries permits a very large proportion of the fish that ascend the river on Saturday and Sunday to escape capture and molestation and to reach the headwaters of the Sacramento or its tributaries.

There seems no evidence of any improvement in the salmon fishery of the San Joaquin River. The physical conditions appear very unfavorable and distasteful to the migrating salmon. According to the reports of fishermen and members of the California Fish Commission, nearly all the fish which begin the ascent of the San Joaquin are diverted when they reach the Georgiana Slough, the uppermost path of communication between the waters of the Sacramento and San Joaquin rivers. They enter the slough and pass into the Sacramento, and seem to be attracted by the much cooler and muddier waters of that stream. This is in marked contrast with the behavior of the striped bass in the same waters.

In a subsequent chapter the quantities of salmon shipped to San Francisco dealers from the Sacramento River in 1893 and 1894 are shown. The following table gives the number of pounds of fish utilized at the canneries. It appears that the 2 canneries in operation in 1894 received 543,082 more pounds of salmon than the 3 canneries did in 1893, and that the increase over the receipts of the same 2 canneries was 1,255,582 pounds.

Statement

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Statement of the number of pounds of salmon utilized for canning on the Sacramento River in 1893 and 1894.

Location of canneries.	Spring.		Fall.		Total.	
	1893.	1894.	1893.	1894.	1893.	1894.
Benicia .....	147,442	297,889	63,200	355,300	210,642	653,189
Black Diamond .....	292,500	.....	520,000	.....	812,500	.....
Chippis Island .....	138,125	573,300	335,060	713,520	473,785	1,286,820
Total .....	578,067	871,189	918,860	1,068,820	1,496,027	1,940,009

The salmon pack of the Sacramento River, as shown in the following table, was 23,336 cases in 1893 and 28,463 cases in 1894. The increase in the output of the two canneries that were in operation both years was 17,627 cases.

Statement of the number of cases of salmon packed on the Sacramento River in 1893 and 1894.

Location of canneries.	Spring.		Fall.		Total.	
	1893.	1894.	1893.	1894.	1893.	1894.
Benicia .....	2,294	4,068	1,253	5,175	3,547	9,843
Black Diamond .....	4,500	.....	8,000	.....	12,500	.....
Chippis Island .....	2,125	8,820	5,164	9,800	7,289	18,620
Total .....	8,919	13,488	14,417	14,975	23,336	28,463

*Salmon trolling in Monterey Bay.*—For many years the hand-line fishermen of Monterey Bay, who seek cultus-cod, bonito, rock-cod, etc., have from time to time had their hooks carried away by fish, sometimes supposed to be large bonito, which their lines were not strong enough to retain. Some years ago, when a large body of small mackerel suddenly appeared in the bay and were taken with hand lines, the fishermen, when hauling in the fish, would often have them seized by other fish and taken off, with parts of the line. Occasionally a salmon was caught, but it was not known that salmon would regularly take the hook or that they occurred there in sufficient numbers to warrant a special attempt to obtain them. In 1893, however, a troll-line fishery was established there by anglers which reached large proportions and resulted in the capture of a great many salmon. It was the first year that any formal attempt was made to take the fish in that way or place. The fishing was done principally from Santa Cruz and Capitola. It was carried on from sail and row boats, with stout lines and hooks, attached to fly rods or simply fished by hand. Sardines were used for bait.

The salmon were found in the bay from early in June to about September 1. Some very large catches were made. Mr. G. M. Ord, of Soquel, Cal., took 1,900 pounds in four days, using a nine-ounce fly rod, with sardines as bait. Another man took over 3,500 pounds during a brief visit to the bay.

The following interesting account of this fishery is extracted from an article contributed by Mr. J. Parker Whitney to the issue of "Forest and Stream" for July 29, 1893:

#### SALMON FISHING WITH FISH BAIT.

This is a comparatively new method of fishing, and one which salmon fishermen are almost entirely ignorant of. To those interested in the king of fishes, the salmon, the harbor of Monterey presents an opportunity of peculiar interest. Here the salmon is found in pursuit of its natural food, and exhibiting many features which give an insight into the ways which have been so mysterious before. Almost yearly the salmon come into the bay of Monterey, as well as that of Santa Cruz and

a few other places on the coast, where they sometimes remain for months, and pursue their feeding as other fish do, and where they are readily caught with fresh-fish bait. I have lately had the great pleasure of taking a few score, and for the benefit of those who, like myself, have been in the habit of taking these noble fish with the fly, I will give the result of my experience.

When the salmon strike in about the bay, and generally near the shore, which occurs here about the 10th of June, they do so in the pursuit of squid, sardines, anchovies, smelts, and other small fish, and their presence is first indicated to the fishermen by the occasional disturbance of the surface water by the small fish in their efforts to escape. This is a signal for the Italians, Portuguese, and other market fishermen to go out for them, which they do in both sail and row boats. These men all fish for the market and waste no time in sentiment. They are equipped with stout cotton lines sufficiently strong to pull in salmon hand over hand. A stout sea hook is used, with a sinker weighing half a pound. The line is about 200 feet in length, the sinker is attached a short distance above the hook, and the line is paid out about 100 feet from the boat, and in the slow sailing or rowing, which is about the same speed as followed in trolling for trout, the bait sinks down 20-odd feet. The sardine or small fish, if not too large, or over 6 inches in length, is put on whole, otherwise it is cut diagonally, making two baits.

The salmon seizes the bait and hook and is pulled in alongside the boat without ceremony, where it is either yanked in or gaffed. Fully half of the salmon hooked are lost by the careless manner of handling, and about two baits are stripped to a salmon hooked. About once in twenty or thirty times two salmon are brought in at one time. I have reason to believe that at times when salmon first come in, and in schools, that the fishermen catch doublets often in succession.

My first experience was in going out with two fishermen in their boat and in witnessing their method. The boat I was in secured three salmon by the hand lines; the other boats did better, some taking as high as eight or ten; about a hundred salmon were taken by the fifteen boats out that morning.

I could find no record of taking the salmon with rod excepting that of my friend Mr. A. L. Tubbs, of San Francisco, from whose information I was induced to look up the fishing. His rod fishing is the only one I have heard of as applied to the salmon in salt water, and I have seen no other during my fishing except that of Mr. Simpkins, of Boston, who accompanied me on one of my fishings and who succeeded in catching one of the largest salmon I have ever seen caught here, weighing 32 pounds. I equipped myself in San Francisco with the best I could get—two cheap bamboo trolling sea-bass rods of 14 ounces and 9 feet in length. My additions were light sea-bass linen lines No. 18, 600 feet long, and No. 4-0 Kirby hooks. The hooks I had soldered to a short link of strong brass wire, to which were attached three more additional brass-wire links, with swivels between, adding to the wire above the shank of the hook a small brass-wire projection without barb, to hold the bait-fish head in position, long half-pound lead sinkers with holes in each end. These, with a multiplying reel, completed my outfit.

The game commences when the salmon is brought toward the surface. Then the salmon will frequently strike off on the surface in a straight line several hundred feet. In two instances I have trembled for my line, being compelled, with all the strain I dared to put on, to allow the fish to take out within 50 or 100 feet of all I had, although the boat was being propelled as rapidly as two men could row toward the fish. But it has been rarely that I have paid out over 400 feet.

Not so often as in fresh water does the salmon leap out of water, and seldom more than two or three times.

My daily catch has averaged nearly eight fish and given most exciting sport. The careful weight of 69 salmon caught I find to be 1,133 pounds, or about 16 pounds each. The smallest was a grilse of 5 pounds and the largest of 30 pounds.

All my catches have been in the early morning, starting out at 4 o'clock and getting back to the Hotel Del Monte in each instance but one for lunch. The exception was an all-day fishing, when I secured 18 salmon, weighing 286 pounds.

As with trout, I have found the morning best, and after 10 o'clock the fishing falls off. Two or 3 miles of rowing has been required to reach the fishing-ground from Monterey pier, and the fishing-ground I have found so far to extend over an area of about 2 miles long by 1 mile wide, although I have no doubt that the salmon could have been found out 2 or 3 miles beyond that limit. I have caught, in addition to the salmon brought in, half a dozen rockfish, called bluefish by the fishermen, but not bluefish as known East, weighing about 5 pounds each; also two codfish of 5 or 6 pounds, and two flounders of 5 and 8 pounds. In a dead calm the fishing about ceases, as with trout in trolling; but

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with a return of the breeze the fishing takes on again. The method of taking forcibly reminds me of the trout. Shyly at times, and again boldly, sometimes striking several times at the bait, and with following up and striking at intervals of a few seconds; at times biting off half the bait and in following up for the balance, and in one instance following up the bait with frequent half-decided action until the bait was within 10 feet of the boat and then fiercely seizing it while I had the line in my hand. It proved a close call in a double sense, as the fish was a heavy one of 25 pounds, and carried the line out of my hand and the sinker attached, which rested in the boat, and very nearly got away with my whole outfit. I fortunately still held my rod in hand, and although I paid out nearly the whole of my 600 feet of line, the fish was well hooked and in fifteen minutes was brought to gaff. In boldness and general action the salmon have reminded me constantly of trout, paying but little attention to the boat, occasionally passing in sight within a few feet and striking on the surface at an occasional small fish, and at times going entirely out of the water in pursuit.

For experiment I tried the spoon, but fancied I did not do as well as with bait, although I caught two salmon with it. I also tried the spoon with fish bait, catching one that way, but believe the fish bait alone to be the best. The salmon upon being opened seem to have more squid inside than other fish, although at times full of sardines, and oftener with anchovies. Sardines are, however, the best bait, and squid but indifferent, while I have had some success with smelts and young shad. At one time, out of bait, I used a strip of salmon belly, which did well enough to catch two salmon.

As I have my salmon rods for fly fishing I shall later on try a little surface work with the fly, but I do not anticipate much success; still I believe they will take under favorable circumstances, when they are as plentiful as I am informed by the fishermen they are outside the harbor at times in deeper water, when the fishermen have sometimes observed several salmon at a time, even up to a dozen in number, following the bait up almost to the boat's side.

The fishing in the harbor is in more or less turbid water, with a depth of from 6 to 10 fathoms; while outside of the bay, in deeper water, it is clearer and the salmon can be more distinctly observed. I am informed by the fishermen that at times the salmon are so plentiful a few miles beyond the harbor that they are enabled to fill their boats in a few hours. These occasions, however, are rare, and where the salmon are found plentiful one day they may not be found the next. It has been usual, however, for the salmon to remain about and in the harbor for several weeks each year, although they skip their annual visits occasionally. The small fish which the salmon follow into the harbor come in countless numbers, often in large, moving masses, and their presence is indicated to the fishermen by the hovering sea gulls, pelicans, and other predatory birds. These are seen busily at work on the salmon-grounds, and often indicate the most favorable places for fishing. While the salmon evidently come in schools at first, it would appear that they scatter more or less about, instead of remaining together, although they mass more or less when in the vicinity of large schools of small fish. The fishermen are more or less guides for each other, and they may be scattered over a square mile without doing much in catch. Presently one or two commence hauling in, which congregate all the others in the vicinity, and the fishing goes on merrily for awhile. Then a scattering takes place again, and a regathering afterwards. Still, I have found about as good success in passing up and down in certain localities as in following the fishing boats.

The market fishermen, as I have previously observed, lose fully half of the salmon they hook; it is a straight overhand pull, and no give except that which is compelled by want of strength. The line and hooks are strong, and the fishermen have no time to wait. If the salmon are plentiful they do not much mind the losses, which often occur from neglect in using the gaff. With the light rod, the fish, if hooked, is seldom lost. I brought in several with skin holds, which would not have been held for a moment in hand fishing. One salmon which I caught had been on one of the market fishermen's line and had a torn hook-mark in his mouth and a cruel gaff cut between his ventral and anal fins. The gaff cut was nearly 3 inches long, and had penetrated nearly to his other side, and was too serious to have ever healed up again. The fish was a large one, of about 21 pounds in weight, and in fine condition, although the gaff cut was evidently two or three days old. The wound had evidently made but a slight impression on the appetite of the fish, as it struck fiercely and fought hard. \* \* \*

I found the salmon which exhibited the most gamy qualities to do their fighting near the surface, seemingly to disdain any depth after once being brought up, and to often make an almost complete circuit of the boat. Certainly a more beautiful sight than a salmon exhibits, with his brilliant colors as he strokes along with his powerful tail near the surface in the clear water and bright light, never gladdens the heart of a fisherman. We all know the dangers to which the salmon is exposed in fresh

water, and from which but few survive, as it is doubtful if but very few, if any, ever return from the upper streams which they ascend after the spawning season, at least when such upper waters are far removed from the sea. If they have the exposures in the deeper waters of the sea which follow them in the shoal water of Monterey Bay, their lives are indeed beset with constant risk. I saw daily in the bay on the fishing-grounds the enemies and consumers of the salmon at their deadly work, in the form of seals, porpoises, sharks, and cowfish. One day when I was out, which was very foggy, I was startled by the uprising of a curiously peaked hump two boat lengths ahead. It seemed to me like a boat's end elevated with a black cloth over it, but a moment later revealed the half of an enormous bewhiskered sea lion, which, raising itself half out of the water, revealed a form which must have weighed at least a ton. In its mouth was a large salmon, which it had evidently just caught. The insatiable appetite of these monsters of the deep, of which hundreds abound in the vicinity, would indicate that they are not slow to avail themselves of the salmon invasion. Well, I thought, the part which man plays in the devastation of the salmon in the sea is but trifling compared with that which occurs from their natural enemies beneath the waters.

It is clear that the salmon of Monterey Bay are those which belong to the Sacramento or San Joaquin River group. Their average weight confirms this, and that they are not of the Columbia River. The distance from Monterey Bay to San Francisco Bay, into which the Sacramento and San Joaquin rivers pour, is about 90 miles. Monterey Bay and that of Santa Cruz, a few miles north, and at some of the sounds and bays north on the coast, are the only places known where the salmon is found engaged in taking his food, and where it can be caught with fresh-fish bait. It certainly presents a favorable opportunity for studying the salmon in its normal condition, in its prime, engaged in seeking its natural food. Here its manners and peculiarities can be examined with ease, and some knowledge obtained of the class of food upon which it best thrives. All this can be obtained and the salmon brought to gaff in his superior condition before the advanced condition of the organs of reproduction have reduced its delicious flavor or weakened the vigor of its efforts.

This year the fishery promises to be much more extensively followed than last year. Professional fishermen-owning boats and regular boatmen will resort to the bay from more or less remote places. Early in June some fish were taken, but a period of stormy weather drove them off. On June 13 some fishing was going on.

An interesting point connected with this subject is that these are undoubtedly the fish that constitute a part of the fall run of salmon in the Sacramento River. Last fall the Sacramento River fishermen took a number of salmon in their nets which had hooks in their mouths—clearly fish which had been snagged in Monterey Bay.

#### THE COLUMBIA RIVER.

*Explanatory remarks.*—The time was insufficient and the conditions not suitable for an examination of the salmon fisheries of the entire river. The extremely high water had seriously affected the fishing in the whole upper river, and a visit at that time would not have been satisfactory even if the indefinite suspension of railroad traffic and the uncertainty of water transportation had not rendered the contemplated visit to the Cascades and The Dalles impracticable.

The inquiry which gave promise of the most satisfactory results was the examination of the important fisheries and large canning interests of the lower river, which were easily accessible and afforded the opportunity of inspecting every prominent method of fishing in the river except that with wheels. It was therefore in Astoria, the great center of the salmon industry in the river, that most of the time available for the examination of the Columbia River basin was passed. Here and in Portland, where some time was also spent, it was possible to meet fishermen and canners from all parts of the river.

The accompanying memoranda on the salmon industry simply represent mostly the personal inquiries and observations of the writer, and are far from being a complete account of the business. Many things were observed which, while of great interest

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