DIVISION OF FISH AND GAME OF CALIFORNIA
FISH BULLETIN No. 15
The Commercial Fish Catch of California for the Years 1926 and 1927

By
the
BUREAU OF COMMERCIAL FISHERIES

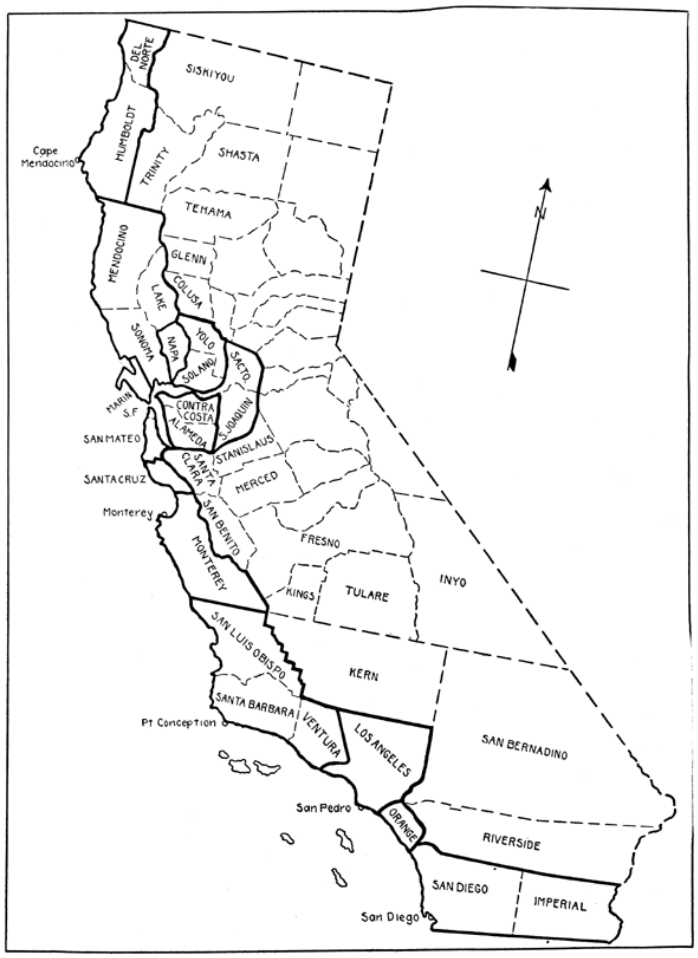

FIG. 1. Map of California with combination of counties for purpose of gathering statistics of the commercial catch. Counties included in the heavy line contribute to the commercial catch, while those in the light dash line do not.

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1. INTRODUCTION

By W. L. SCOFIELD

1.1. Purpose of this Bulletin

The purpose of this bulletin is to present the statistics of California's commercial catch of fish in graphic form so that certain relationships and significant features may be more readily recognized than is possible from consulting the published tables showing quarterly and annual totals. This bulletin presents the monthly catch figures for 1926 and 1927. These catch totals by months have been compiled by the Bureau of Commercial Fisheries since the complete statistical system was inaugurated, which has proved of great service in the administration of one of the most valuable of the natural resources of the state. As monthly catch records have not previously been published, it is hoped that their presentation here will prove of interest and that this publication may become the first of a series of annual bulletins, each one of which will present and analyze the catch records of the preceding year.

1.2. Authorship

Authorship of this bulletin is being credited to the Bureau of Commercial Fisheries, because the statistics of fish catch form the basis of this publication and practically every member of the Commercial Fisheries staff has had a hand in collecting, tabulating or filing the records of catch. Credit is due especially to those members of the staff, who struggled against discouraging handicaps ten years ago in establishing the system of catch records, and who have since that time continuously endeavored to correct mistakes and guide an unorganized industry in the making out of dependable detailed records. Many men in our fisheries were unaccustomed to keeping records of any kind, and many of foreign birth did not write English. The task of establishing and maintaining such a system has been great, but the results have more than justified the exacting conscientious effort that has been expended.

It should then be understood that in the following bulletin, the real work was done by those who collected and tabulated the data, whereas plotting the results and pointing out significant features are relatively simple matters. The signatures appearing here merely serve to fix responsibility for the arrangement of the data for graphing and the comments thereon.

1.3. So-called "Pink Ticket" System

It is our intention to describe and explain in another publication the various forms of statistical information collected by the Bureau of Commercial Fisheries, so that only a brief mention of our fish catch records is necessary here. In the first place, these records include only the fish, mollusks and crustaceans taken in California or brought into the state for commercial purposes. The fish and other marine animals caught for sport are not included in these figures. In some cases, as with Pismo clams for example, the amounts taken by sportsmen for pleasure far exceed the quantities sold commercially.

The laws of California require that each person buying fish from a fisherman shall make out a record of this purchase in triplicate on

forms (tickets) furnished by the state, the first copy going to the fisherman as a receipt, the second used by the purchaser for posting in his own books, and the third (pink ticket) given to the state as an official document showing the date, locality, purchaser, fisherman, fishing boat, pounds weight of each species caught, price and use to which the fish is put. The distinctive feature of this system is the fact that the daily delivery of each individual fishing boat is the unit of catch used. This is the basis for boat catch analysis to determine the presence or absence of overfishing, but such questions are not involved in this consideration of total catch figures. These boat catches may then be compiled in any form desired, such as daily catch for a given fishing port, receipts of certain dealers, catch by districts of the state for a day, month, year or fishing season, catch by type of gear, or total annual catches for the state as a whole for any one species or group of species.

1.4. Value of Catch Figures

Without entering into a discussion of the subject, it should be pointed out that total catch figures serve a real purpose and are in fact the very foundation of our knowledge of the fisheries of any one region. Frequently total catch statistics are accepted merely as an indication of the amount of business handled and to show whether a business is increasing or declining from year to year. This is the type of information that would interest a chamber of commerce.

Greater value lies in the fact that detailed catch records enable the administrator of a fishery resource to have at hand for ready reference exact and dependable information as to the seasonal importance of each fishery in each locality, and their characteristics and trends from month to month and from year to year. This is basic information continually sought by the administrative officers and by the state legislature when laws applying to any fishery are under discussion.

The fact is usually overlooked that such information forms a general background of knowledge for detailed biological studies of individual species. Some significant biological facts lie hidden in the catch records and may be uncovered by proper analysis of the figures.

1.5. Catch and Supply

We earnestly plead with the reader not to interpret the above paragraph to mean that total catch figures necessarily represent the abundance of fish. Nor does a change in the catch from year to year necessarily mean an increase or decline in the abundance of fish in the ocean. The total catch depends very largely upon the amount of fishing effort. Total catch may increase while actual abundance is declining. A striking example of this was our salmon fishery a few years ago where the figures of total catch were mounting each year due to increased fishing effort at the very time when we knew from other sources that the supply of salmon in the waters of this state was steadily diminishing. Finally, the supply has become so low during the last few years that redoubled effort fails to yield the former return, and the total catch has now dropped, but only after our supply became dangerously low.

Restrictive legislation is usually intended to reduce the catch, and if effective the results are obviously legislative and not due to declining supply. The supply in the ocean may decline for other reasons, but not as the result of protective legislation limiting the catch. If one law is successful in reducing the catch, this is not proof of the need for an additional law, yet such fallacious reasoning is too often given a respectful hearing. It is a surprisingly common mistake to assume that a change in total catch is proof of a change in supply. What a paradise this would be if total catch did indicate supply. We could restock our trout streams merely by doubling the number of anglers, because increasing the number of trout caught out of a stream would increase the number remaining in the water. If catch is allowed to enter the discussion of supply, it should be presented in the form of catch per unit of fishing effort.

The catch figures of this bulletin do not consider the amount of fishing effort, interrelation of different fisheries, changing economic conditions, nor any of the factors affecting the catch. These graphs and tables picture pounds of fish landed, nothing more. Changes in total catch are shown, but other changes such as price paid, number of boats, gear or fishing methods are not indicated in a record of total catch. The determination of why a catch changes is in each case a subject for special study. After such a study, in which all factors affecting the catch have been considered, we may arrive at a conclusion as to the state of the supply of fish. Supply of fish is merely one of many factors affecting the total catch. Supply may be found to be the chief factor influencing the catch in some particular fishery, but it may be, and frequently is, very secondary, so that an estimate of the importance of this one factor can be arrived at only after considering all the other factors. It is to be hoped that no reader of these pages will be guilty of misusing these figures of total catch in support of his pet notion as to the supply of some particular species of fish. If he has made a careful study of all the various conditions influencing the catch, recognizing that supply is merely one of many factors, he will be very welcome to quote these figures in his discussion of supply, for he then will not be misusing these data.

1.6. Local, High Seas, Imports, and the Three Mile Limit

Literally, "state waters" would extend only three miles from shore, but this limit is practically disregarded because fish caught outside and brought within the three mile limit are under jurisdiction of the state. The three mile limit off the California coast is of significance only in exceptional cases, as for example when a law applying to a specified district of the state prohibits the catching of a certain species of fish but allows its possession through importation. In most cases where fish are to be landed at a point close to the fishing grounds, there is nothing gained by making a distinction between fish caught inside and just outside an imaginary line drawn three miles from shore. However, the three mile limit becomes very significant when the fish caught near it are not intended for immediate landing, but are to be carried to another state or foreign country. This limit then determines whether or not the first state or country has jurisdiction over the fish. An

exception to this is when two or more countries mutually agree by treaty to disregard the three mile limit in a specific fishery or region.

For practical purposes, we therefore use the term "locally caught" to include fish caught both inside and outside the three mile limit of California. There is no point in our distinguishing between the "high seas" fish caught three and one-half miles off our shores and the "local fish" (from a legal standpoint) caught two and one-half miles off our shores, because it will all be landed at California ports and come under our state jurisdiction anyway. In this sense then, "high seas" fish in popular rather than legal language would imply that the catch was made more than three miles off the shore of some *foreign country*.

In loose, common usage, we often carelessly apply the term "imported" to fisheries products brought into the state from foreign waters without specifying whether or not the catch was made inside the three mile limit or was transported to a point inside the three mile line in that country before shipping to this state. In a legal sense, the three mile limit of the foreign country is the boundary line used in distinguishing "high seas" fish from catches made under or transported within the jurisdiction of that country.

Thus every day usage and legal definition are somewhat at variance for the three terms, "local," "high seas" and "imported." Strictly speaking, over half of our so-called "local" fish are caught on the high seas. What we designate as "high seas" includes only a portion of the fish actually caught in international waters, since the "high seas" fish caught off this state are not included. In common language, the term "imported" is applied not only to fish imported from a foreign country, but includes also a considerable percentage of fish caught on the high seas and never coming under the jurisdiction of any foreign country.

These discrepancies between careless, common usage and legal language have led to confusion, especially in the case of fish caught off the west coast of Mexico. Nearly all the fishing off that coast is done outside the three mile limit. Some of this fish is transported into Mexican state waters when the fishermen go inshore to catch bait or to tranfer the catch to a larger vessel, and it then enters the jurisdiction of Mexico and is subject to Mexican taxation. It is later carried to California and is thus literally "imported" from Mexico. However, a certain percentage of the catch off the Mexican coast never goes within the three mile limit of Mexico and is thus high seas fish, which is not subject to taxation by Mexico or any other government until it is brought within the jurisdiction of some country. This fish is not "imported" from Mexico. It is high seas fish, the same as if caught in the open ocean four miles off the coast at San Francisco. Since this fish is landed in this state it is California fish in the same legal sense as that caught off San Francisco.

In spite of this fact, we have attempted to separate the fish landed in southern California into two groups, the one made up of both local Mexican and high seas fish that is caught south of a westward extention of the international boundary line between the United States and Mexico, while the other group is composed of the local and high seas catches made north of the extended boundary line. This is of biological interest, but of no legal significance. Even the biological or geographical

distinction is not basic since the whole coast line from Point Concepcion southward is in reality one fishing area. The distinction is of some use in subdividing the one large area into two arbitrary portions, a northern and a southern, but further subdivision into local and more restricted fishing areas is necessary before the separation is of any considerable biological interest.

Our catch figures include tuna brought into the state from Japan and the Hawaiian Islands. They do not include the codfish brought in from Alaska, nor the dried abalone from Mexico. Whether or not this Alaskan cod should be included is a matter of opinion. Also the whaling catches are not included, regardless of whether or not the catch is landed in this state or is made inside of or outside the three mile limit. Our records do not cover the amounts of fish caught and used for bait. In most cases, bait is not sold, being taken by the fisherman for his own use, but some is sold direct from the boat without being landed and a small portion is sold ashore in wholesale lots to be retailed later. The bait catch consists chiefly of sardines. It is much larger than is usually supposed, especially at San Diego where it is estimated to exceed the cannery "quarter oil" catch.

1.7. A Fishing Area Common to California and Mexico

The waters off the twelve hundred miles of coast line from Point Concepcion to a point about two hundred miles south of Cape San Lucas (the southern tip of Lower California) in Mexico comprise one great fishing area. From the standpoint of the fishing industry, it is distinctly one southern California fishery since the fishing is conducted by California boats and fishermen, and the catch is made for southern California and landed there. Although one fishery, it is arbitrarily cut into four portions by two imaginery lines drawn on the map. The boundary line between the United States and Mexico when extended westward divides the area horizontally into northern and southern portions, while the three mile limit running vertically cuts a three mile strip off the eastern edge of this fishing area. The fishermen, the fish, and the ocean currents pay little attention to these lines, and the only excuse for drawing them is in such cases as involve the levying of duty or determining state and national jurisdiction.

The fishery conducted at the northern end of the Gulf of California is distinctly separate from the large southern California fishery just mentioned, for it is different in every respect. The species of fish taken are different, the fishing area is isolated, the boats, gear, and methods of fishing are very unlike the open ocean fishery, and the catch is made by Mexicans in Mexican waters and landed on Mexican soil. The fact that the fish is later transported into California by truck is incidental. These operations at the upper end of the Gulf of California are distinctly a Mexican fishery. There are also two or three very small localized Mexican fishing operations conducted on the west coast of Lower California to supply small capacity canning plants. The areas fished and the amounts of catch are insignificant compared with the large scale industry of the southern California fishery operating in the west coast waters.

As already explained, our effort to separate the fish caught north and south of the extension of the international boundary line really

has no very fundamental significance, and the attempt is not entirely successful because fishing vessels clearing for the high seas and making a catch in international waters are not concerned with the question of whether or not the exact locality of catch was north or south of a hypothetical extension of an international boundary line projected into those international waters. The separation is becoming increasingly difficult with the increase in the number of boats equipped for remaining on the high seas without entering Mexican ports and without fishing in Mexican waters. For biological reasons, it is desirable that we know the locality of catch with as high a degree of accuracy as possible, within common sense limits.

1.8. Errors

Only a person inexperienced in handling statistical data will accept printed tables of figures at their face value as one hundred per cent correct, but anyone who has compiled such tables himself knows that there are opportunities for error in collecting the original data. Constant vigilance has been used in locating and correcting such sources of error and still our records will always fall short of complete accuracy. Compared with most production statistics, we consider these records to be of a very high degree of accuracy and completeness.

In our tables we have followed the almost universal practice of retaining figures to the single pound instead of rounding off the totals, but anyone at all familiar with such data will recognize this as a fictitious indication of accuracy to the exact pound.

1.9. Common Names

During past years the inconsistent use of common names was a source of much confusion, some of which detracts from the value of our early records. One fish being known by several names and the same name being applied to several species was not uncommon. In different sections of the state, somewhat different names are applied, but the serious difficulty arises in unexpected changes in the use of names, especially when such changes are not uniformly adopted by all the dealers in one region of the state. What common name is used is not of great importance so long as we are sure just what fish is meant. Unannounced and inconsistent changes in names have to be carefully watched to avoid error. We now feel that we have a fair understanding of the local variations in names and have eliminated the sources of error that amount to any considerable confusion in our records.

The final solution of this question is for the Bureau of Commercial Fisheries to issue a standard list of common names with photographs and descriptions of the species to which the name should be applied. Such a publication is now in course of preparation, and it will then be necessary to encourage gradually the use of these names throughout the state. Naturally, the commonly accepted trade name will be adopted as standard wherever possible.

Since a list of standard common names has not yet been officially chosen, we are presenting a preliminary list prepared by Mr. J. A. Craig to show the common names at present used in our tables with the

corresponding scientific names of the species. We are indebted to Mr. G. S. Myers of Stanford University for corrections and notations. This list is not to be accepted as indicating the final official name to be adopted; it is presented merely to show what fish is meant by our published catch records. Although this list shows most of the common names as they will probably stand, it may be necessary to make some changes in the future. Common names have no monopoly on the privilege of changing, for many of the scientific names unfortunately have been changed in recent years. For this reason we, in two instances, have placed in parentheses the better known but superseded scientific name.

San Pedro, California. October, 1928.

2. LIST OF COMMON AND SCIENTIFIC NAMES OF FISHES

By J. A. CRAIG

Common name	*Scientific name*
Albacore	Germo germo
Anchovies	Engraulis mordax mordax
	Engraulis mordax nanus
	Anchoviella delicatissima
	Anchoviella compressa
Barracuda	Sphyraena argentea
Bonito	Sarda chiliensis
Carp	Cyprinus carpio
Catfish	Ictalurus punctatus
	Ameiurus nebulosus
	Ameiurus catus
Cultus Cod	Ophiodon elongatus
Flounders	Platichthys stellatus
	(other Pleuronectinae)
Grayfish	Squalus sucklii
	(and other sharks)
Hake	Merluccius productus
Northern Halibut	Hippoglossus hippoglossus
Southern Halibut	Paralichthys californicus
Hardhead	Orthodon microlepidotus
Herring	Clupea pallasii
Kingfish	Genyonemus lineatus
	(small percentage of Seriphus politus)
Mackerel	Pneumatophorus japonicus diego [1] (Scomber japonicus)
Mackerel, Horse	Trachurus symmetricus
Mullet	Mugil cephalus
Perch	Embiotocidae
	(all species found in California)
Pike (Sacramento)	Ptychocheilus lucius
Pompano	Palometa simillius
Rock Bass	Paralabrax clathratus
	Paralabrax nebulifer
Rockfish	Sebastodes
	(all species found in California)
Sablefish	Anoplopoma fimbria
Salmon:	
King or Quinnat	Oncorhynchus tschawytscha
Silver or Coho	Oncorhynchus kisutch [2] (milktschitch)
Sandabs	Orthopsetta sordida
Sardines	Sardina caerulea
Sculpin	Scorpaena guttata
	Scorpaenichthys marmoratus
Sea Bass—Black	Stereolepis gigas
Sea Bass—White	Cynoscion nobilis
Shad	Alosa sapidissima
Sheepshead	Pimelometopon pulcher
Skates	Species of Rajidae, Mantidae,
	Dasyatidae, Aetobatidae
Skipjack	Euthynnus pelamis
Smelt	Species of Atherinidae and Osmeridae
Sole	Parophrys vetulus
	Pleuronichthys decurrens
	Eopsetta jordani
	Lepidosetta bilineata
	Errex zachirus
	(other Pleuronectinae)
Splittail	Pogonichthys macrolepidotus
Striped Bass	Roccus lineatus
Suckers	Catostomus occidentalis

[1] The California mackerel has recently been separated from the Japanese as P. diego by Jordan and Hubbs, but since the differing characters intergrade, the present subspecific designation must be used. (G. S. Myers.)

[2] The Coho or Silver Salmon has been supposed to be the one called milktschitch by Walbaum, but until the case is settled it seems best to use the more well known kisutch. (G. S. Myers.)

Swordfish	Xiphias gladius
	Makaira mitsukurii
Tuna—Yellowfin	Neothunnus catalinae
Tuna—Bluefin	Thunnus saliens
Turbot	Pleuronichthys verticalis
	Hysopsetta guttulata
	Pleuronichthys decurrens
	(possibly other Pleuronectinae)
Whitebait	Spirinchus thaleichthys
	(also other small fishes)
Yellowtail	Seriola dorsalis

3. COMMERCIAL SPECIES—QUANTITIES AND VALUES IN ORDER OF IMPORTANCE

By S. S. WHITEHEAD

There are some fifty species of fish and twelve species of mollusks and crustaceans landed annually in California. These yearly landings vary from a few pounds to hundreds of millions, as in the case of sardines.

Figure 2 gives the total landings in California of the first thirty species in order of amount for 1926.

The whole catch by species could not be shown on one graph because of the wide variation in amounts, and also for lack of space—thirty species are all that can be placed conveniently on a page. Sardines can not be graphed to their relative amount on account of their being over twenty times greater than any other fish.

Figure 3 is the same as figure 2, only that it is for 1927. Figure 4 is an average of each species for the last five years (1923–1927).

3.1. Value of 1926 Catch

A fishery may produce a large amount and yet the value the fishermen receive for their efforts may be less than from a smaller fishery. To illustrate this, figure 5 for 1926 was prepared. For example, the catch of sardines in amount was fourteen times that of skipjack, and yet in value not quite twice as great.

Albacore, which formerly ranked next to sardines in amount landed, in 1926 was fourteenth in amount and twelfth in value. Salmon, which before the recent war was the biggest fishery, has declined to the seventh place in amount and third in value.

The values for 1926 were computed by the United States Bureau of Fisheries from our statistical records.

3.2. Total Catch by Districts

California's commercial catch is derived chiefly from the counties bordering on the ocean, and also from a few counties around the lower reaches of the Sacramento and San Joaquin rivers. In the statistical records published, the catches of some of the counties have been arbitrarily combined into districts. (See map referred to as figure 1, which shows the counties that have been grouped together.)

Figure 6 was prepared to show the total amounts of fish (including mollusks and crustaceans) that each district produces. These landings for the three years, 1925–1927, were averaged in order to eliminate any minor yearly fluctuations of catch. All landings from south of the international boundary line have been credited either to San Diego or San Pedro.

3.3. Catch, Exclusive of Cannery Fish, by Districts

The California catch is made up principally of two groups—the catches for canneries and those for the fresh fish markets. The significant aspects of the fresh fish catch are hidden when graphed with the cannery catch because of the great magnitude of the latter.

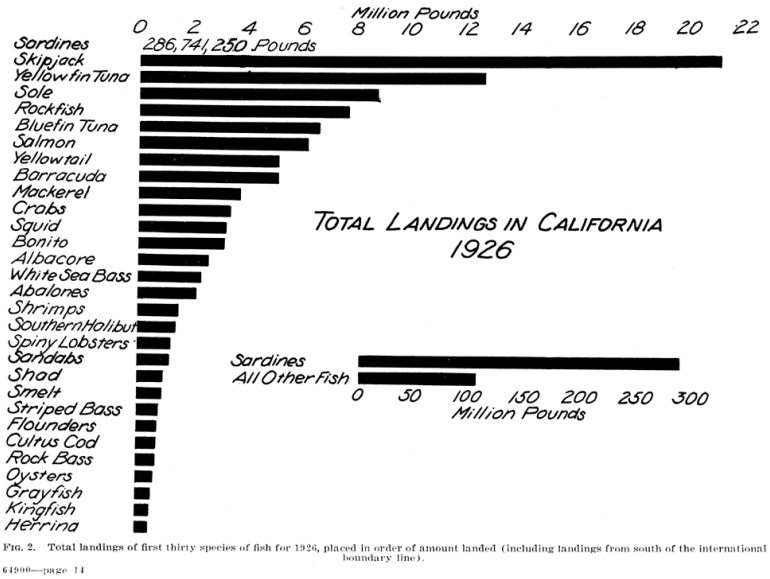

FIG. 2. Total landings of first thirty species of fish for 1926, placed in order of amount landed (including landings from south of the international boundary line).

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FIG. 2. Total landings of first thirty species of fish for 1926, placed in order of amount landed (including landings from south of the international boundary line)

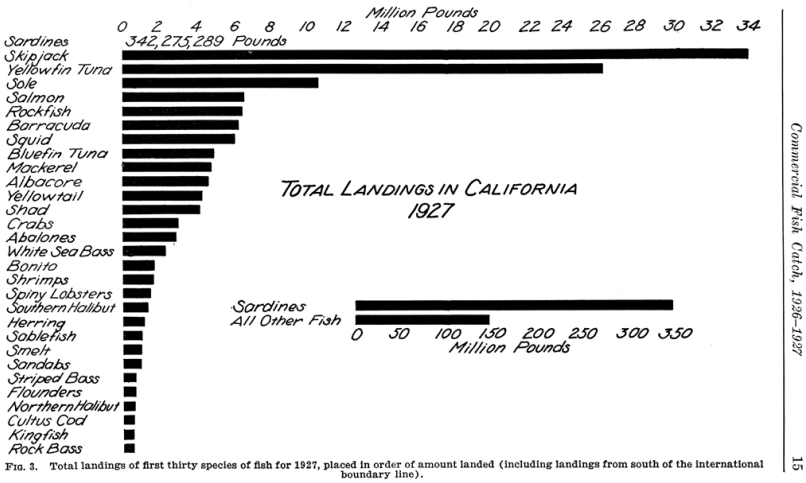

FIG. 3. Total landings of first thirty species of fish for 1927, placed in order of amount landed (including landings from south of the international boundary line).

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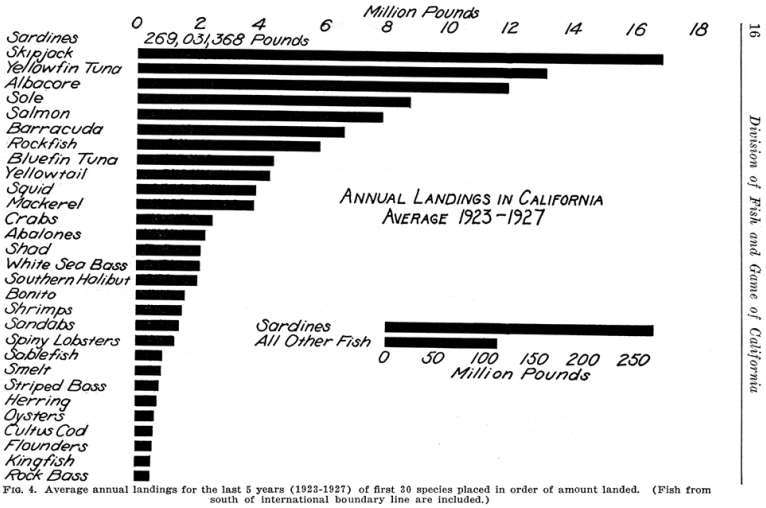

FIG. 4. Average annual landings for the last 5 years (1923–1927) of first 30 species placed in order of amount landed. (Fish from south of international boundary line are included.)

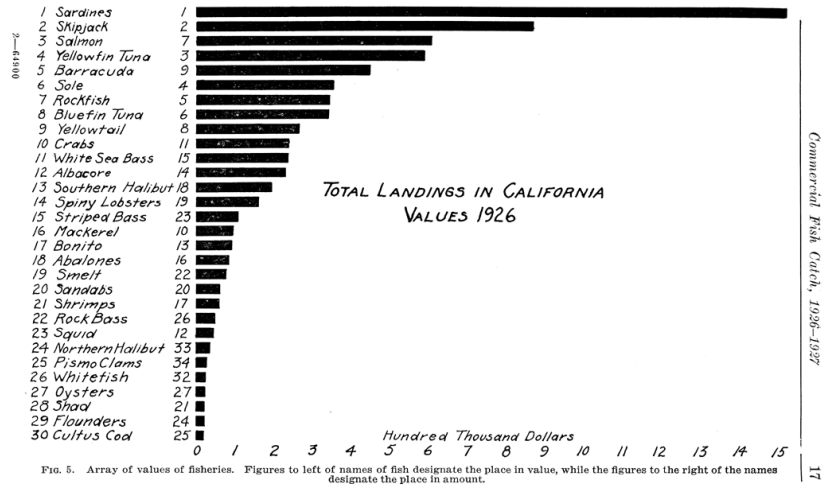

FIG. 5. Array of values of fisheries. Figures to left of names of fish designate the place in value, while the figures to the right of the names designate the place in amount.

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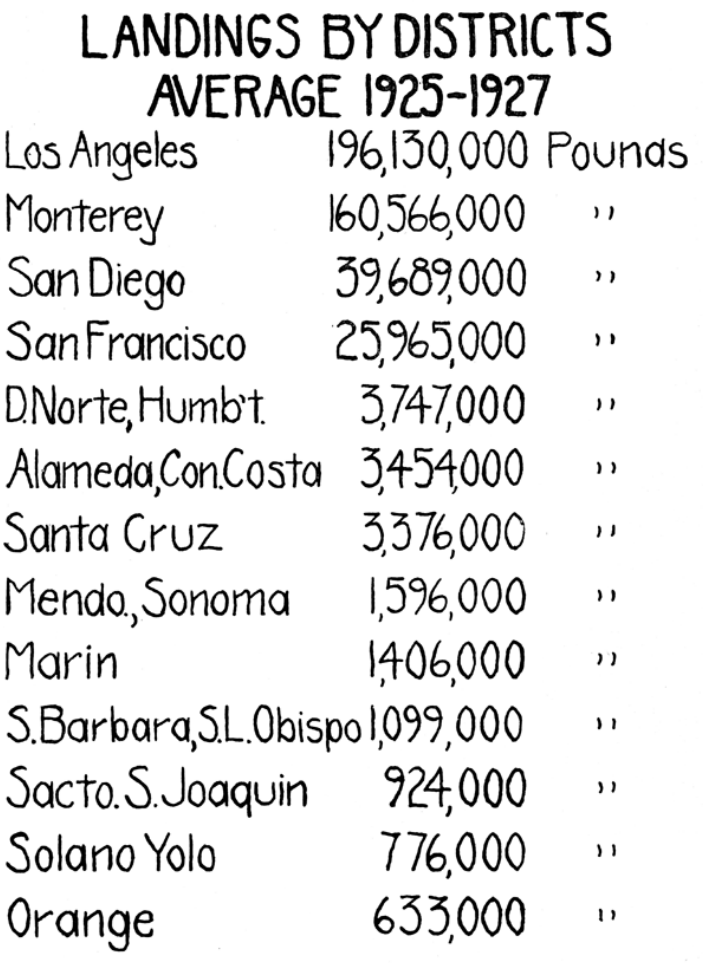

FIG. 6. Average annual landings of fish (including mollusks and crustaceans) in each district of the state.

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Figure 7 shows the catch of all fresh fish, exclusive of cannery fish, mollusks and crustaceans, by districts in order of amounts landed. Sardines, yellowfin tuna, bluefin tuna, albacore and skipjack were classed as cannery fish. Salmon was considered a fresh fish. Landings from south of the international boundary line were credited either to San Diego or San Pedro. An average of the last three years, 1925–1927, was taken as in figure 6. Monterey's catch as shown by this graph is principally composed of sardines, a cannery fish, while San Francisco's is chiefly fresh fish.

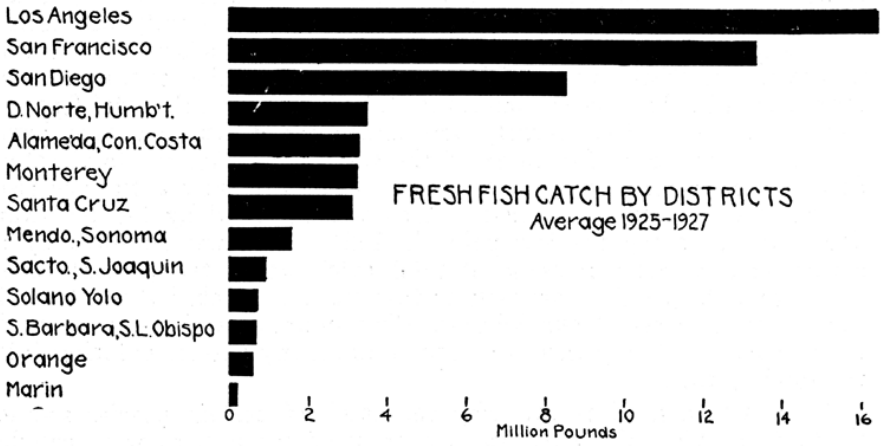

FIG. 7. Average annual landings of fresh fish at each district exclusive of mollusks, crustaceans and cannery fish.

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4. CANNERY AND MARKET FISH

By W. L. SCOFIELD

In speaking of the commercial catch of "fish," we commonly exclude the various species of mollusks and crustaceans which add considerably to the poundage and value of the marine products of California. We disregard such valuable resources as the abalone and spiny lobster, and even discriminate against such fish-like creatures as the squid and shrimp, but for the purposes of this discussion we will continue to use the term "fish" in its narrower literal sense, excluding the crustaceans and mollusks.

If we look at the figures showing the total catch of fish landed in California for the past fifteen years, we are misled into assuming that the various fisheries of the state have had a spectacular development in the last four years. It is true that the catches of three or four species have increased remarkably, but the great majority of species have been caught in about the same quantities year after year for the past twelve or fifteen years. The increase in the catches of the three or four species has been so enormous that they have raised the total figures. These few species have largely determined the fluctuations that have occurred in the total fish catch of the state. In 1915, the total catch figures were beginning to increase and each year saw a further rise till the war time peak in 1919, which was followed by the post-war depression reaching the low point in 1921. This was followed by a steady and meteoric increase of total catch up to the present time. These great fluctuations are true of the total fish catch, but not true of the catches in most of our fisheries. The impressive changes occurred in the catches of only three or four of the many species entering into the total figures.

There was a good reason why the catch of certain species should fluctuate so violently while the majority of the species were caught each year in uniform and moderate amounts. The one word "canning" explains this difference between kinds of fish and accounts for the rise, fall and enormous rise in the total catch figures.

In spite of the increase in the state's population, the sales of fish in the fresh fish markets of the state increased but little. The market sales of most species grew somewhat, but the depletion that occurred in the supply of several of our staple varieties about offset the growth in sales that naturally would be expected as the state settled up. Mild curing, salting and smoking were the earlier methods of preserving fish, but they were not sufficiently successful to greatly increase the amounts of fish caught, although the mild curing and shipping of king salmon undoubtedly had much to do with the big catches in past years of that one species.

The canning method of fish preservation made possible the utilization of great quantities of fish in a short time. Fish in this form could be kept indefinitely so that it could be sold and shipped as the market demanded. It was the canning of salmon, in addition to the mild curing, that made the heavy drain on our salmon supply in past years. When overfishing and the cutting off of spawning grounds so depleted

our salmon supply that canning was no longer very profitable, it was found that other species could be substituted for salmon in the cans. Sardine canning, starting on San Francisco Bay, was developed in southern California, where also the canning of tuna jumped into prominence with the opening of the World War. The post-war slump hit the canning business very hard causing a sudden drop in the catch of fish used in canning, but those varieties of fish sold in the fresh state were but little affected. The great increase in pounds of fish landed during the last four years has been almost entirely limited to the few species used in canning.

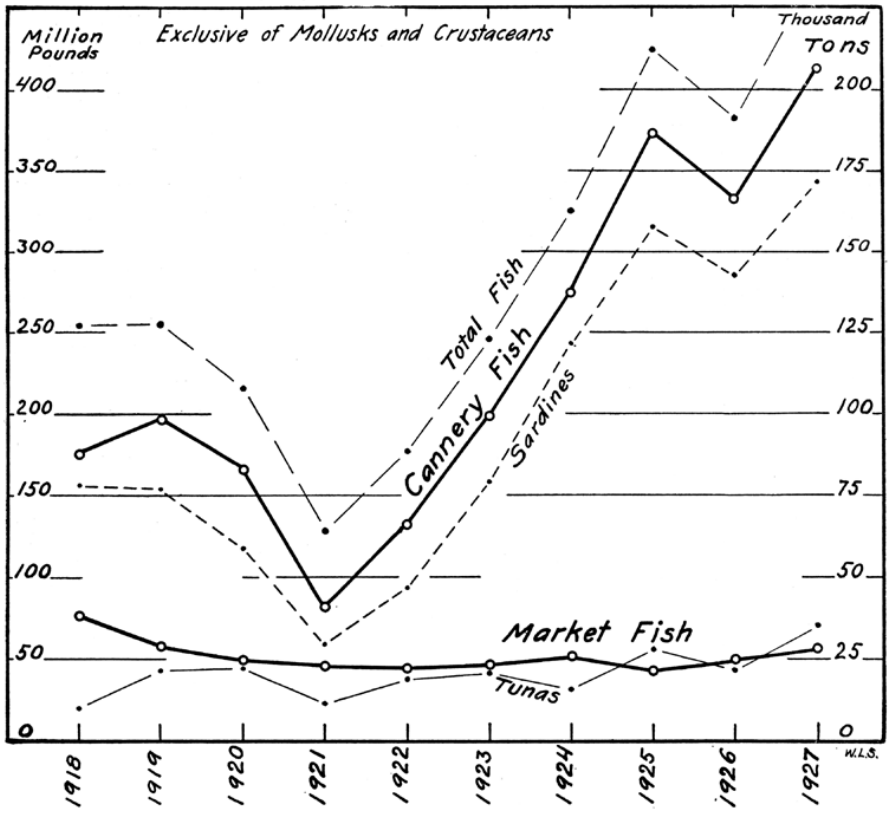

FIG. 8. Contrasting "Cannery" and "Market" fish. The left hand vertical scale is in pounds while tons are shown at the right hand side. These figures are landings of fish in California (including catches made by California vessels off the coast of Lower California).

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The graph shown in figures 8 was prepared as an illustration of the fact that there has been but little fluctuation in the catch of "market fish," that is, those varieties sold as fresh fish, whereas great changes have occurred in the catch of "cannery fish" or those varieties used in canning. Even a casual glance at figure 8 brings out the fact that the great fluctuations in total catch in California are determined by the "cannery fish."

"Cannery fish" as here used includes but six of the many species landed in the state, sardines and the five tunas—albacore, skipjack,

yellowfin tuna, bluefin tuna, and bonito. A very small percentage of the poundage of tunas and a negligible amount of sardines, is used by the fresh fish markets, and on the other hand small amounts of other species of fish are sometimes used in canning, but these exceptions are insignificant in volume and do not affect the curves as plotted in figure 8. In "market fish" we include all the fish sold in the fresh state, which means the total catch of the fifty or so kinds of fish landed in the state, minus the six species used for canning. The two curves labeled "total fish" and "cannery fish" are thus almost identical in shape and similar in amount, the difference between them being the "market fish" poundage which is fairly uniform and relatively small in amount. In the last ten years, the market fish have averaged about 50,000,000 pounds, while the cannery fish catch was over 400,000,000 pounds in 1927, but was about 80,000,000 pounds in 1921.

In figure 8, the catch of the five tunas is shown as a light line at the bottom of the graph, and is also represented in the difference between the two curves labeled "cannery fish" and "sardines." The catch of the five tunas is about equal to the "market fish" catch in amounts, but it is not so uniform from year to year. The tuna catch fluctuates roughly with the sardine catch, but in less degree, suggesting that the fluctuations are due to general economic conditions in the state. A reference to the graph shown in figure 49, shows that of the five tunas the chief fluctuation is to be found in the curves representing the three species, albacore, skipjack and yellowfin tuna, while the catches of the other two species, bluefin tuna and bonito, do not vary so greatly from year to year and the changes that do occur have little weight in the total tuna curve because of the relatively small amounts caught of these two species. The albacore catch has varied independently of the other tunas, so that the skipjack and yellowfin catches have the most influence in determining the trend of the total tuna catch. These two species have in the main followed the trend of the sardine catch, being high during the war, low in 1921, and on the increase for the last seven years.

5. SARDINES

By W. L. SCOFIELD

It has been pointed out elsewhere in this bulletin that the amounts of fish sold in the fresh condition are relatively small (50,000,000 pounds) as compared with amounts delivered to canneries (over 400,000,000 pounds in 1927). Although the "cannery fish" curve of figure 8 includes six species, the major fluctuations from year to year are really determined by the one species, sardine. Actually, the total catch figure of all fish landed in California fluctuates with the sardine catch since this one species is landed in amounts that dwarf the

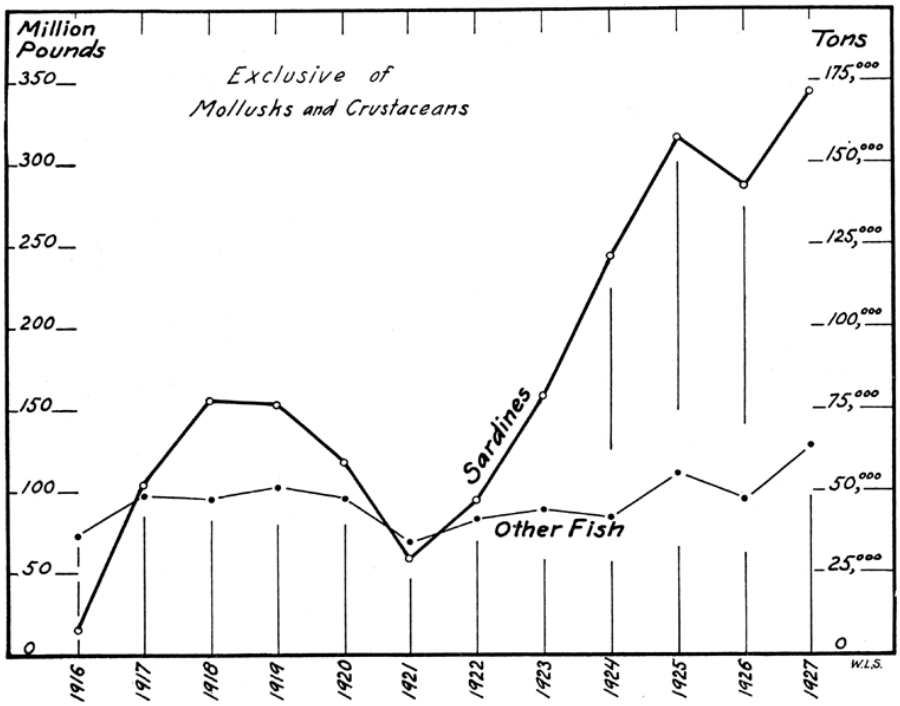

FIG. 9. Of the fish landed in California ports, sardines are contrasted with the combined catches of all other species. Pounds are shown on the left hand scale and tons at the right.

FIG. 9. of the fish landed in California ports, sardines are contrasted with the combined catches of all other species. Pounds are shown on the left hand scale and tons at the right

combined catches of all other species. For the last few years sardines have outranked the combined catches of all other species by about three to one. This is illustrated in the curves of figure 9, where sardines are contrasted with the catches of all species of fish except sardines. "Fish" as here used excludes mollusks and crustaceans. The preponderance of sardines over all other species of fish in our catch is also illustrated by figure 10, in which fish caught in the territorial waters and on the high seas off the coast of Mexico have been excluded, so that the figures represent our so-called "local" fish caught off the California coast. This limitation excludes a large poundage of tunas brought up from south of the international boundary line, and therefore reduces the figures of "other fish" represented in the bar chart

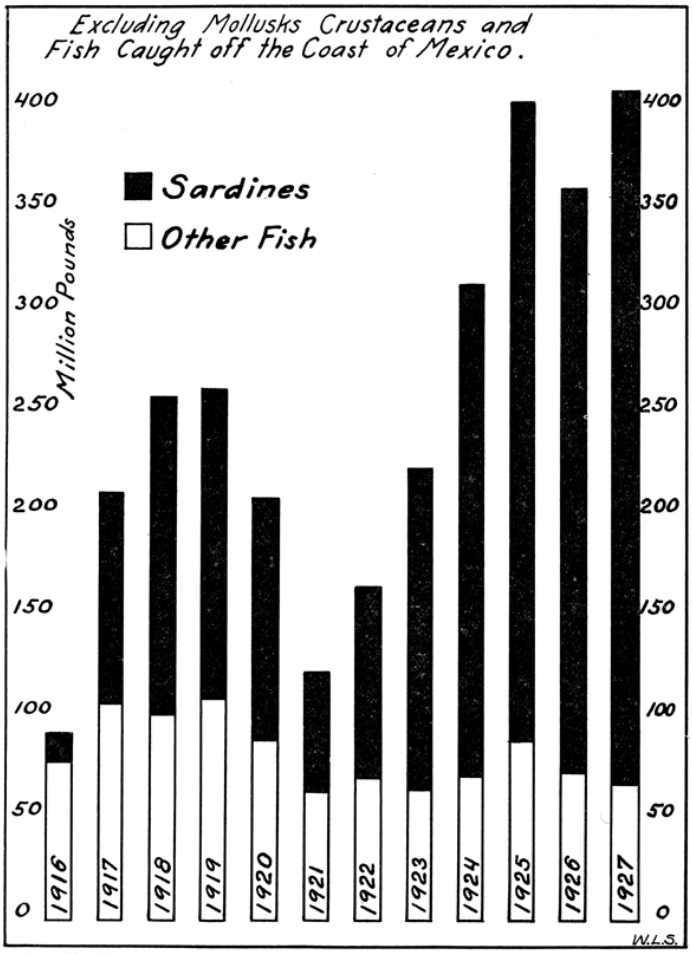

FIG. 10. Represents only the fish (exclusive of mollusks and crustaceans) caught off the coast of California. "Other fish" includes the combined catches of all species of fish except sardines. The top of the black bar therefore represents on the scale the total of our so-called "local" catch.

FIG. 10. Represents only the fish (exclusive of mollusks and crustaceans) caught off the coast of California. "Other fish" includes the combined catches of all species of fish except sardines. The top of the black bar therefore represents on the scale the total of our so-called "local" catch

of figure 10. In this graph the sardine catch for 1927 is more than five times as great as that of all other species of "local" fish.

Such a preponderance of one species over the other fifty varieties caught in our waters naturally determines the trend of our total catch curves, and when inspecting the figures of total fish catch for the state we should remember that we are viewing totals that are dominated by the sardine catch.

The trend of the sardine catch (Fig. 9) has been commented upon frequently in other publications of the Division of Fish and Game of California, and need not be repeated here. The war time boom, post-war slump, and the great increase of the last four years are very obviously the result of changes in general economic conditions throughout

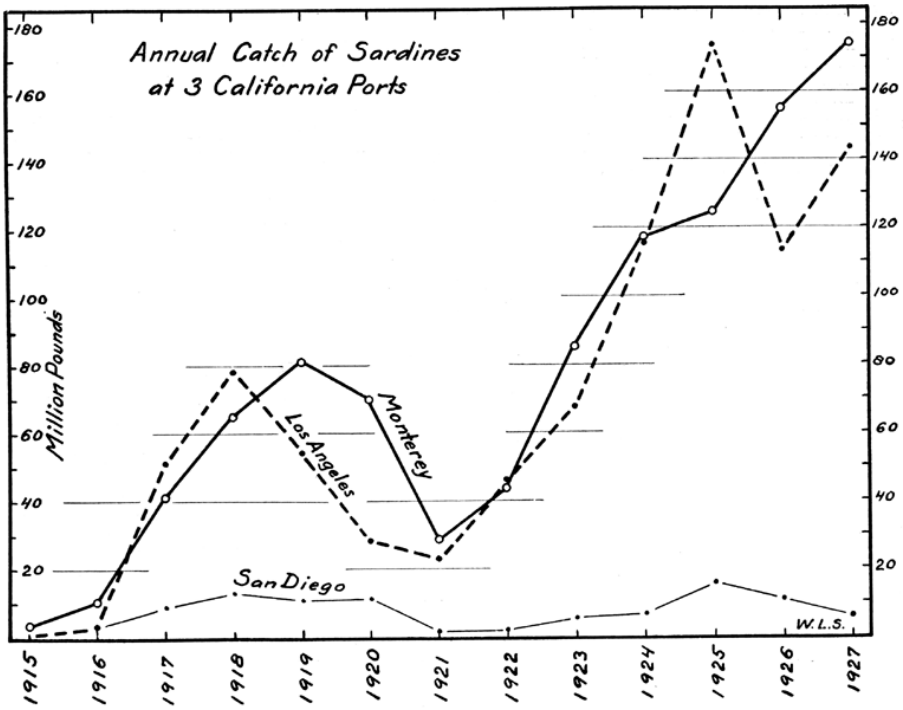

FIG. 11. Annual sardine catch at Monterey, Los Angeles Harbor and San Diego for the thirteen-year period, 1915–1927.

FIG. 11. Annual sardine catch at Monterey, Los Angeles Harbor and San Diego for the thirteen-year period, 1915–1927

the country. The amount of sardines caught is influenced by bank credits, rates of foreign exchange, and the purchasing power of foreign nations as well as by business conditions in our own state.

Although sardines occur and are caught all along our coast, the canning industry has centered at four points in the southern half of the state. San Diego, packing chiefly the small sizes, does not show such a large tonnage of fish received as do the localities canning the larger sizes in pound tins. The general region represented as Los Angeles in figure 11, comprises the canneries located at San Pedro, Wilmington and Long Beach. On Monterey Bay the canning is now done at Monterey although in past years canneries were located at Santa Cruz on the north side of the bay. Recently the canning of sardines near San Francisco has been revived, but as yet only on a

comparatively small scale. Large scale canning of sardines is confined to Los Angeles and Monterey, and these two ports vie with each other as to the size of the pack from year to year. The sardine catch for calendar years by districts of the state is shown in the accompanying table. These figures have been rounded off to the nearest thousand pounds, thus dropping three figures. The table may thus be converted to tons simply by dividing the figures here given by two. Thirty-two (thousand pounds) is the equivalent of sixteen tons.

	Santa Cruz	*Monterey*	*Los Angeles*	*San Diego*	*Miscellaneous*	*Total*
1916	32	10,459	2,592	2,551	15	15,649
1917	6	41,621	52,615	9,718	143	104,103
1918	559	64,915	78,078	13,207	894	157,653
1919	5,142	81,447	54,600	11,183	1,505	153,877
1920	7,343	69,719	28,183	12,167	1,106	118,518
1921	3,985	28,942	23,261	2,160	984	59,332
1922	2	44,677	46,062	2,487	172	93,400
1923	0	85,023	67,493	5,301	342	158,159
1924	0	117,529	116,955	7,109	1,093	242,686
1925	0	124,756	174,403	15,669	467	315,295
1926	2	155,160	113,494	11,027	7,058	286,741
1927	37	173,920	143,547	6,027	18,744	342,275
Totals	17,108	998,168	901,283	98,606	32,523	2,047,688

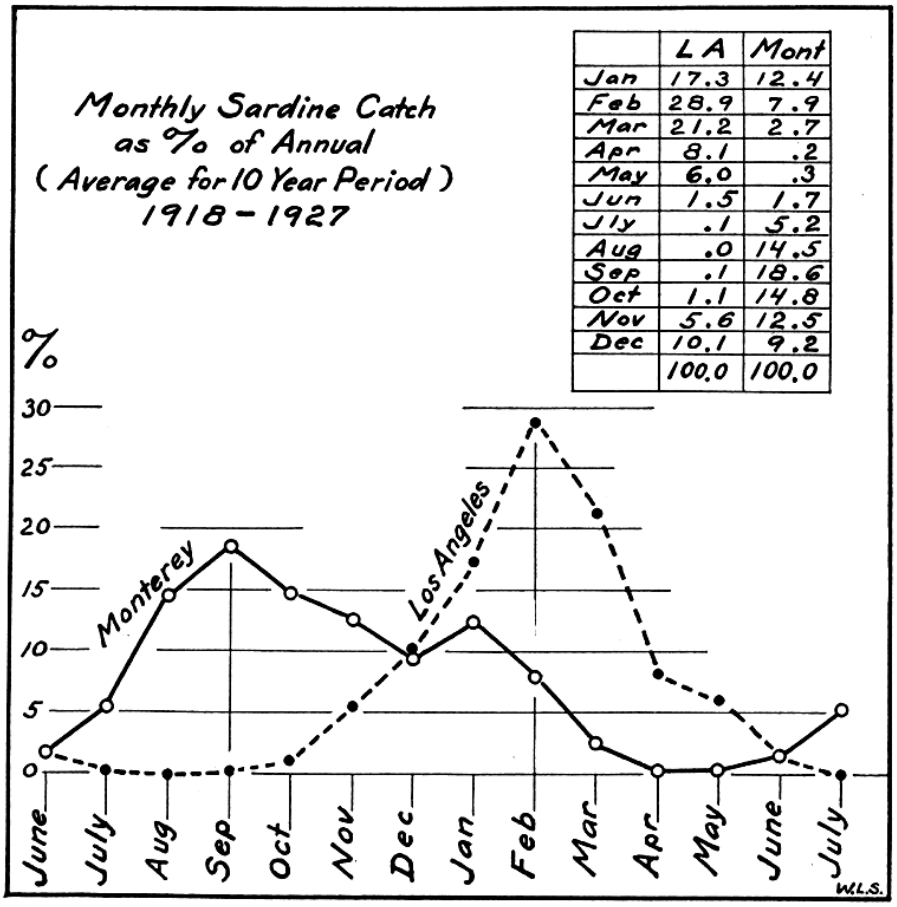

FIG. 12. Monthly sardine catches expressed as a percentage of the annual catch at each port. Percentages averaged for the ten-year period, 1918–1927.

FIG. 12. Monthly sardine catches expressed as a percentage of the annual catch at each port. Percentages averaged for the ten-year period, 1918–1927

There is considerable difference in the fishing seasons at the two chief canning centers, Los Angeles and Monterey. At Monterey the season opens about three or four months earlier than at Los Angeles, and closes only a month or two sooner than the season at the southern port. On a rough average the Monterey season runs from July through March of the following calendar year, while at Los Angeles the season has been in the past from November through May. The height of the Monterey season falls in September, whereas February is the big month at Los Angeles harbor.

It is obvious from figure 11, that for both these canning centers there are great differences from one calendar year to another, so that a simple average would be greatly affected by the big years. There is likewise a very great variation in the catch of individual months, so that a plain average by months is of doubtful significance in judging the relative importance of the months. To overcome these difficulties and to enable us to compare directly the two fishing ports, each calendar year at each port was given equal weight by considering it as one hundred per cent. Each month's catch for one port was then treated as its percentage of the year, which is a convenient way to judge the importance of each month as compared with the other eleven months of the year. An average for the ten year period, 1918 to 1927, was obtained by averaging the ten percentages for each month at each port. The averaging of percentages is in this case justified as it expresses the point desired.

Figure 12 shows the percentages so obtained and the graphed results. At Monterey the seven months of August through February will account for ninety per cent of the annual catch, while at Los Angeles, the seven months' period, October through April, includes ninety-two per cent of the yearly total.

The monthly catches of sardines at the two principal ports have been graphed in figure 13, for the twelve year period, 1916–1927. Both figures 12 and 13 illustrate the fact that the Monterey season is spread over a longer time interval, while at Los Angeles the catch is more concentrated about the peak month, February. It is a characteristic of the Monterey season that December should be less than either November or January. In view of the discussion caused by the Los Angeles May pack of 1927, it is interesting to note in figure 13, that in 1917 and 1919, May was the biggest month of the year and in 1918 it was second only to April. It should be borne in mind that such a graph as shown in figure 13 contrasts monthly catches, but is apt to mislead one in estimating the annual catch which is best judged by figure 9.

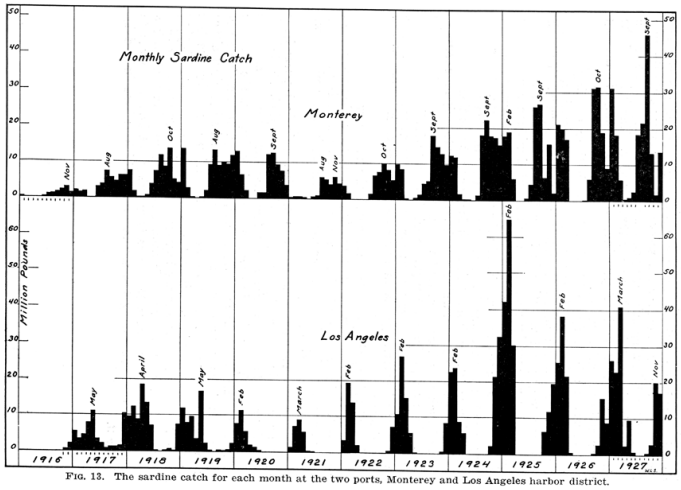

FIG. 13. The sardine catch for each month at the two ports, Monterey and Los Angeles harbor district.

FIG. 13. The sardine catch for each month at the two ports, Monterey and Los Angeles harbor district

6. SALMON

By S. S. WHITEHEAD

The California salmon catch is principally king (Oncorhynchus tschawytscha) and silver (Oncorhynchus kisutch), with the greater proportion of the catch being king salmon. Since California's admission as a state, salmon was the principal fishery until the recent war which caused the start of the sardine and tuna industries. The canning of salmon started in the United States at a little cannery on a barge at the town of Yolo on the Sacramento River by A. S. Hapgood, William and G. W. Hume in 1864. They at first could not create a market in the United States, and so sold to South America and Australia. The salmon here were caught by hand-made gill nets. In 1893, it was discovered that salmon could be caught at Monterey Bay by trolling. Until 1900, all salmon were either canned or sold fresh. At this time (1900) mild curing started on the Sacramento River and the following year at Monterey. From this time (1900) to date big quantities of the large salmon are mild cured.

In 1888, the salmon catch attained a thirteen-million pound total; thereafter it fluctuated until 1919, when it declined rapidly.

Figure 14 shows the trend of the salmon catch since 1916. The middle graph of figure 14 is the comparison of the salmon caught in the rivers with those caught in the ocean. The separation of the two is in the accompanying table. The river caught salmon are from

	1916	1917	1918	1919	1920	1921
Ocean	5,600,000	6,100,000	5,900,000	7,200,000	6,100,000	4,500,000
River	5,300,000	4,900,000	7,100,000	5,900,000	5,000,000	3,500,000
Total	10,900,000	11,000,000	13,000,000	13,100,000	11,100,000	8,000,000
	1922	1923	1924	1925	1926	1927
Ocean	4,300,000	3,700,000	6,400,000	5,500,000	3,800,000	4,900,000
River	2,900,000	3,300,000	3,600,000	4,000,000	2,200,000	1,600,000
Total	7,200,000	7,000,000	10,000,000	9,500,000	6,000,000	6,500,000

Alameda, Contra Costa, Sacramento, San Joaquin, Solano, Yolo, and part of Del Norte and Humboldt counties. All salmon landed in Del Norte and Humboldt, except Eureka, were classified as river caught. Ocean caught salmon are from the counties of Monterey, Santa Cruz, San Francisco, Marin, and Mendocino, and from the town of Eureka in Humboldt county.

The lower graph of figure 14 shows that the Monterey landings were responsible for the relatively large ocean catch until 1921. Without the Monterey catch, the trend of the ocean catch is upward, while the trend of the river catch is down. The heavy solid line is the Monterey catch, the heavy broken line the ocean catch exclusive of Monterey, and the light dotted line the entire river catch.

There has been a change to the north in the districts having large landings of salmon in the last few years as demonstrated by figure 15. The twelve year period (1916–1927) was divided into two six-year

periods, the first period (1916–1921) as shown in the upper graph, and the second period (1922–1927) in the lower graph. A six-year average was taken for each period.

Monterey is the southern limit in the range of salmon, which extends northward into Alaska. Del Norte and Humboldt counties then are

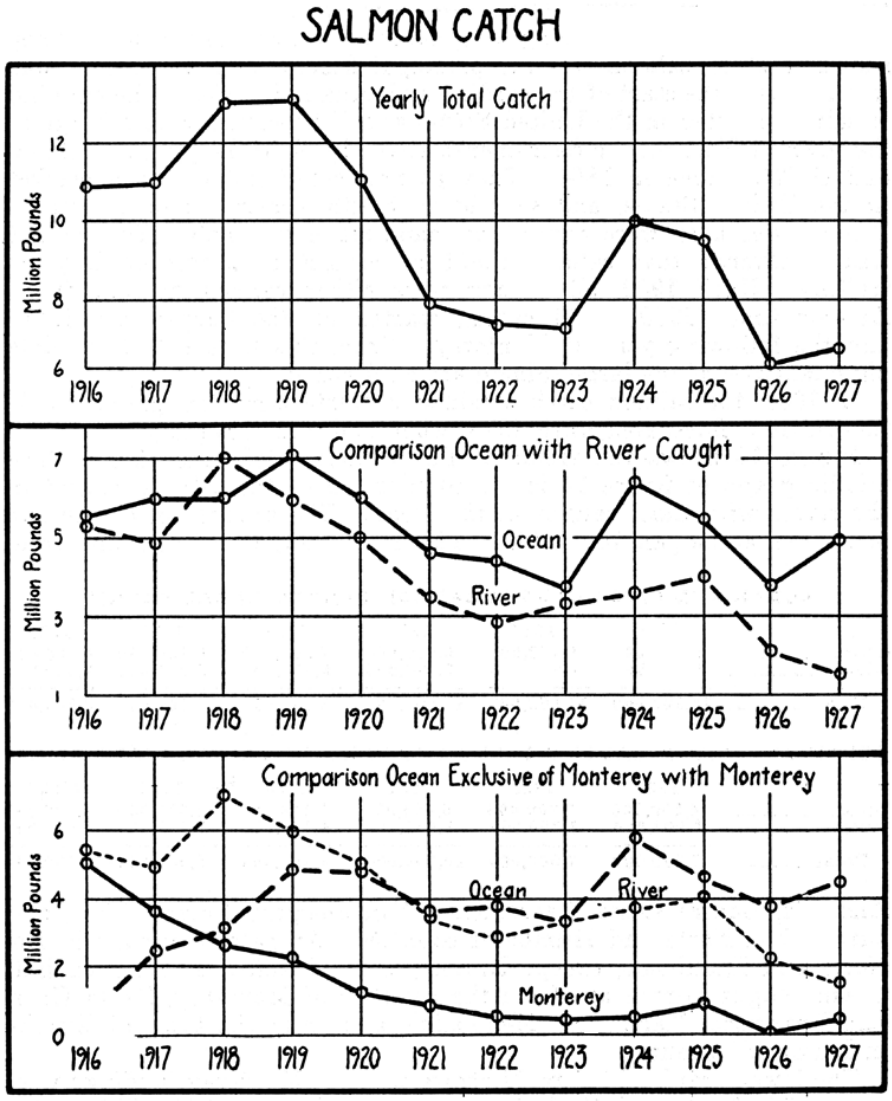

FIG. 14. Upper graph, total catch of salmon by years. Middle graph, ocean caught compared with river caught salmon. Lower graph: heavy line, Monterey catch; heavy broken line, ocean catch minus the Monterey catch; light dotted line, total river catch.

FIG. 14. Upper graph, total catch of salmon by years. Middle graph, ocean caught compared with river caught salmon. Lower graph: heavy line, Monterey catch; heavy broken line, ocean catch minus the Monterey catch; light dotted line, total river catch

nearer the center of the range, which would mean that they probably have a bigger supply from which to draw. When Monterey's catch fell off, an increased effort was made from San Francisco northward, which resulted in the increase in the catch of troll caught ocean fish.

The middle and lower graphs of figure 14 show that the river catch is declining while the ocean catch is increasing. Similar conditions of landings would be expected in districts depending on the ocean and river caught salmon.

The reader must not take for granted that because landings are made at a county or district, the fish are always caught in adjoining waters. Locality of landing depends on economic conditions and transportation facilities. Fish caught off the Marin or even Mendocino coast may be landed in San Francisco. This is not only true in the salmon fishery to the north, but in other fisheries in other parts of the state as well.

The salmon catches of Marin and San Francisco counties were combined in this section only.

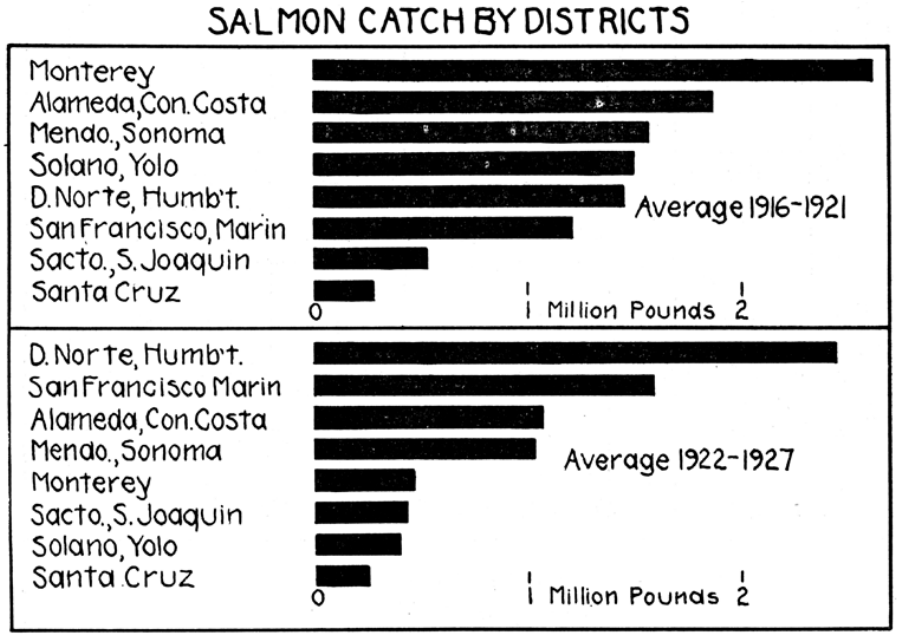

FIG. 15. Upper graph, 6 years' (1916-1921) average catch by districts placed in order of amount landed. Lower graph, 6 years' average, 1922-1927.

FIG. 15. Upper graph, 6 years' (1916–1921) average catch by districts placed in order of amount landed. Lower graph, 6 years' average, 1922–1927

7. ROCKFISH

By S. S. WHITEHEAD

The rockfish catch is made up of several species belonging to the genus Sebastodes. Fishes commonly called rock cod, boccaccio, chilipepper, and at Monterey, bluefish and yellowtail, all belong to Sebastodes and are classified as rockfish.

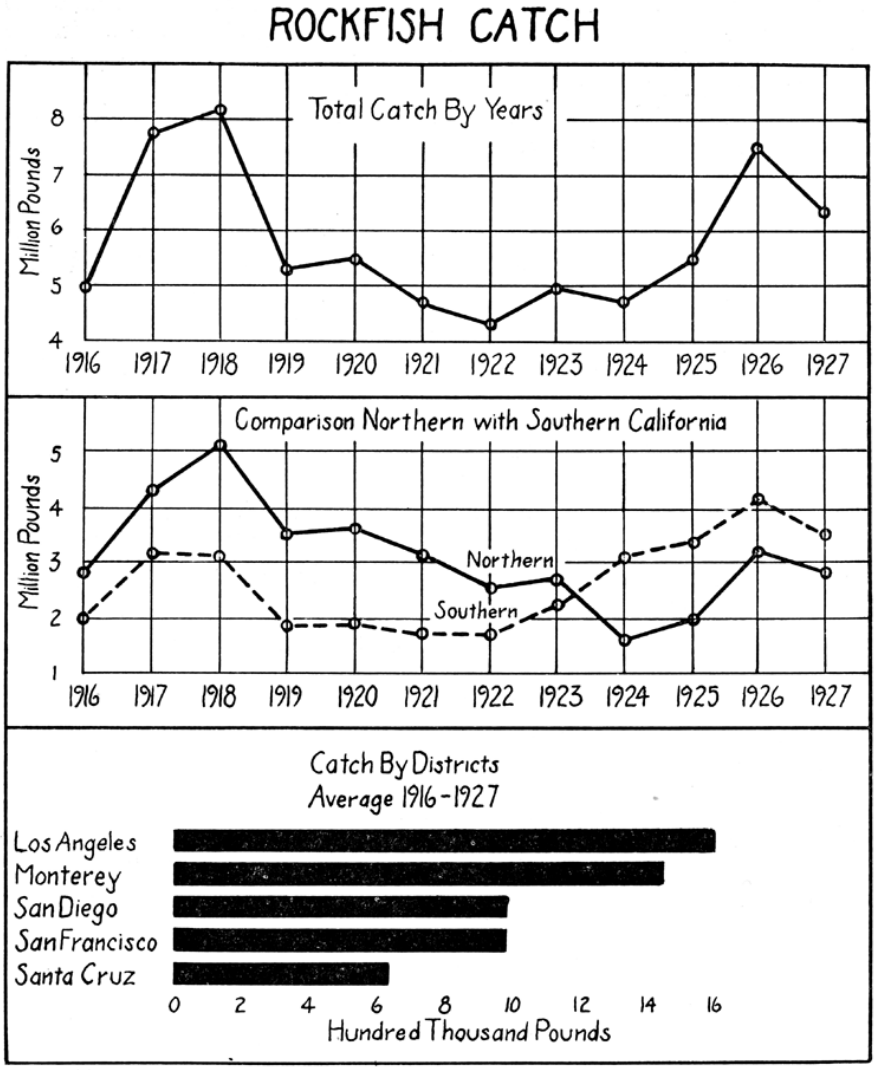

FIG. 16. Upper graph, trend of rockfish catch by years. Middle graph, comparison of northern with southern California. Lower graph, 12 years' (1916-1927) average annual catch by districts.

FIG. 16. Upper graph, trend of rockfish catch by years. Middle graph, comparison of northern with southern California. Lower graph, 12 years' (1916–1927) average annual catch by districts

The upper graph of figure 16 shows the trend of the catch of rockfish since 1916. Every county in California bordering on the ocean is a landing place for the rockfish. Landings from south of the international boundary line are not included as the amounts are negligible.

In the middle graph of figure 16, the landings of northern and southern California are compared. Southern California includes landings in all counties up to and including San Luis Obispo and Ventura counties. Northern California is from Monterey Bay northward. The object of this comparison is to show the trend of northern California

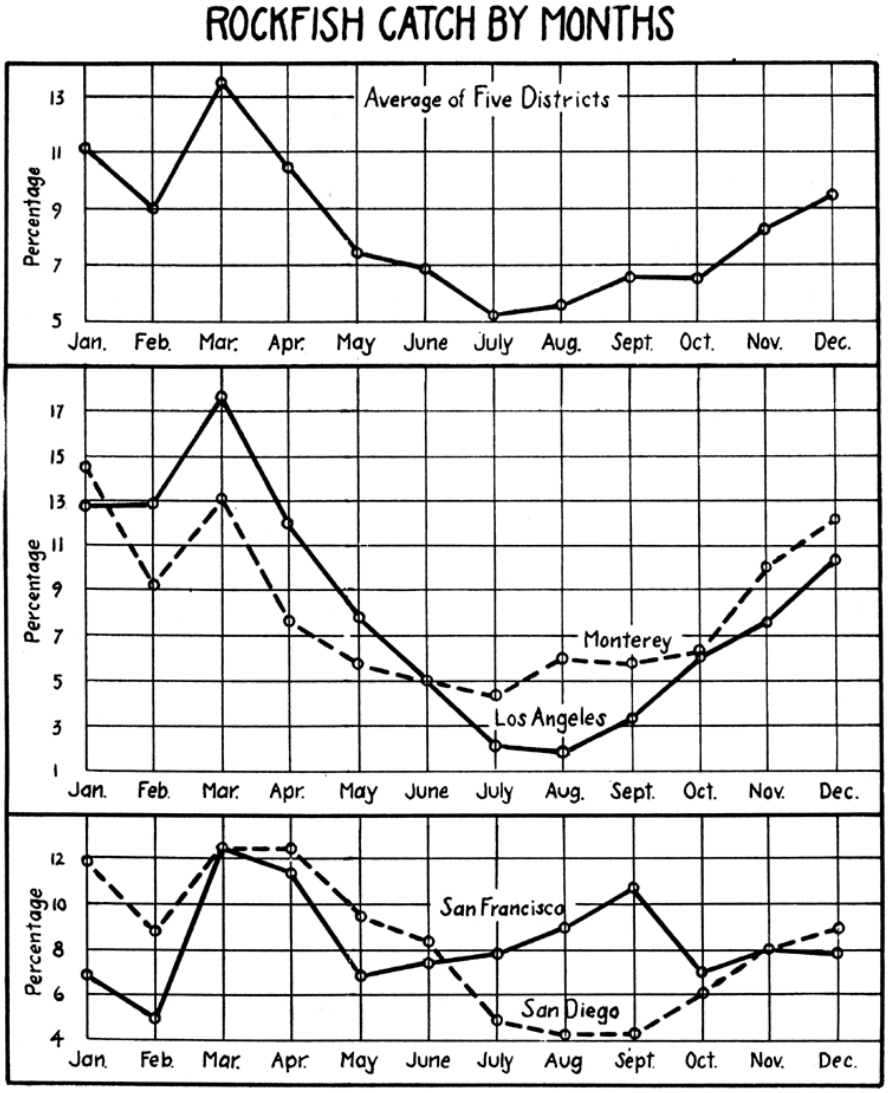

FIG. 17. Upper graph, 5 years' (1923-1927) catch by months of the five most important districts. Middle and lower graphs, 5 years' (1923-1927) monthly catch by districts of Monterey, Los Angeles, San Francisco and San Diego counties.

FIG. 17. Upper graph, 5 years' (1923–1927) catch by months of the five most important districts. Middle and lower graphs, 5 years' (1923–1927) monthly catch by districts of Monterey, Los Angeles, San Francisco and San Diego counties

to be downward, while the trend of the catches in southern California is upward.

The lower graph of figure 16 is an array of the five most important districts placed in order of amount. An average of twelve years (1916–1927)

was used. When a suitable scale for the five big districts was used, the landings of the other districts were too small to be visible.

The three graphs of figure 17 show the relative amounts landed each month. The sum of the five years' catch (1923–1927), of each district was made to equal one hundred per cent; then the sum of each month during the five year period was reduced to its percentage of the five year catch. Percentage was used rather than actual amounts so that districts with unequal catches could be easily compared.

In the upper graph of figure 17, an average of the five most important districts was used to show the percentage of each month's catch to the total.

The middle graph of figure 17 is a comparison of Monterey with Los Angeles; and the lower graph shows the comparison of San Diego with San Francisco.

It should be noted that the accompanying graphs did not start at zero, but at a point just below the lowest month.

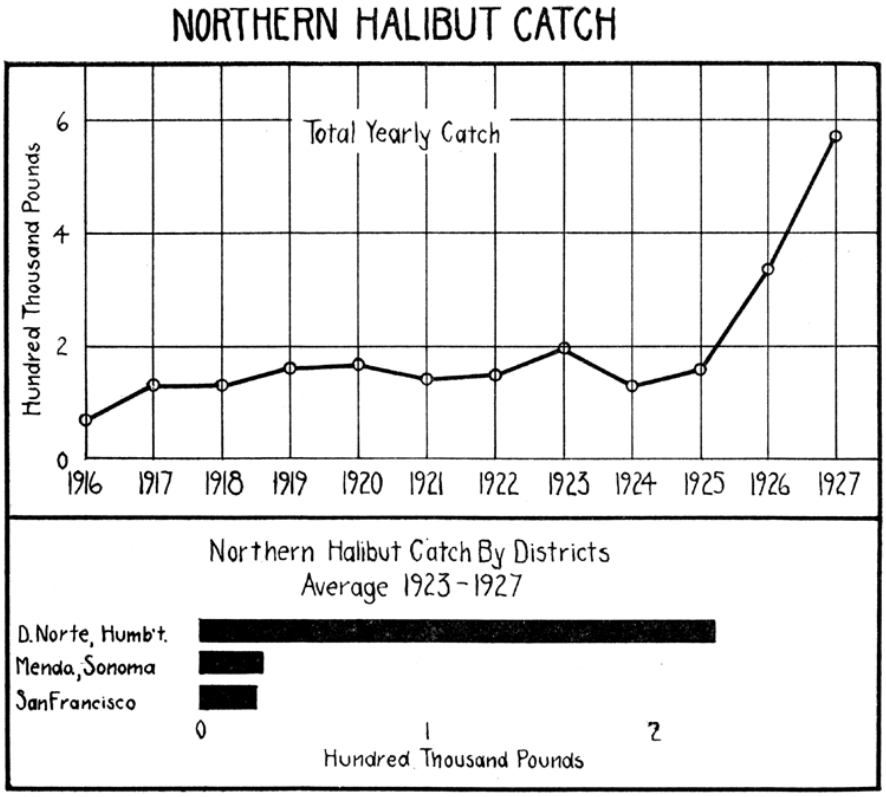

FIG 18. Upper graph, yearly landings of northern halibut in California. Lower graph, graph, 5 years' (1923–1927) average catch by districts.

FIG 18. Upper graph, yearly landings of northern halibut in California. Lower graph, graph, 5 years' (1923–1927) average catch by districts

8. NORTHERN AND SOUTHERN HALIBUT

By S. S. WHITEHEAD

In the past both the southern halibut (Paralichthys californicus) and the northern halibut (Hippoglossus hippoglossus) were classified as one and called halibut. This is incorrect, as the northern halibut is a true halibut, while the so-called southern halibut is a flounder. The northern extremity of the range of southern halibut is at Santa Cruz, and the southern limit of the range of northern halibut is at San Francisco. The only time southern halibut is landed at San Francisco is when San Francisco boats bring fish from Monterey Bay. Dealers at San Francisco report that ten per cent of "halibut" landed is southern halibut. All landings south of San Francisco (and ten per cent at San Francisco) are southern halibut, and landings from San Francisco (less ten per cent for southern halibut) northward are northern halibut. The accompanying table gives the separation and catch of the two species since 1916.

	Southern halibut [1]	*Northern halibut*
1916	4,052,000	70,000
1917	4,379,000	132,000
1918	4,624,000	129,000
1919	4,698,000	161,000
1920	4,280,000	165,000
1921	3,654,000	142,000
1922	3,255,000	149,000
1923	2,229,000	197,000
1924	2,577,000	132,000
1925	2,453,000	161,000
1926	1,349,000	339,000
1927	1,304,000	569,000

8.1. Northern Halibut

The upper graph of figure 18 is the trend of the yearly catch of northern halibut since 1916. The larger catches in 1926 and 1927 were due to the increase in Del Norte and Humboldt counties and in none of the others. This increase of catch in these two counties was due to a few Oregon and Washington halibut boats fishing farther offshore than the California boats formerly did. Then in 1927, some of the California salmon trolling boats copied the northern halibut fishing methods and further augmented the catch of northern halibut.

The lower graph of figure 18 shows the catch by counties in order of amount. An average of the catch for five years was taken in order to minimize the yearly fluctuations.

8.2. Southern Halibut

The upper graph of figure 19 shows the trend of total landings of southern halibut in California (including the landings of fish caught south of the international boundary line). The catch by districts in order of amount is shown by the lower graph of figure 19. An average of the five years was taken as in the lower graph of figure 18.

Figure 20 is a comparison of the combined monthly landings of southern halibut at Los Angeles and San Diego with those south of the international boundary line. An average of the corresponding months of the last eight years (1920–1927) was used to get a more standard

[1] Southern halibut figures include landings from south of the international boundary line.

monthly catch. The graph would seem to indicate that the differences in maximum catches are due to the differences in the time of abundance. But it is also probable that the conditions may be governed by lack of supply off the California coast rather than abundance off the Mexican coast.

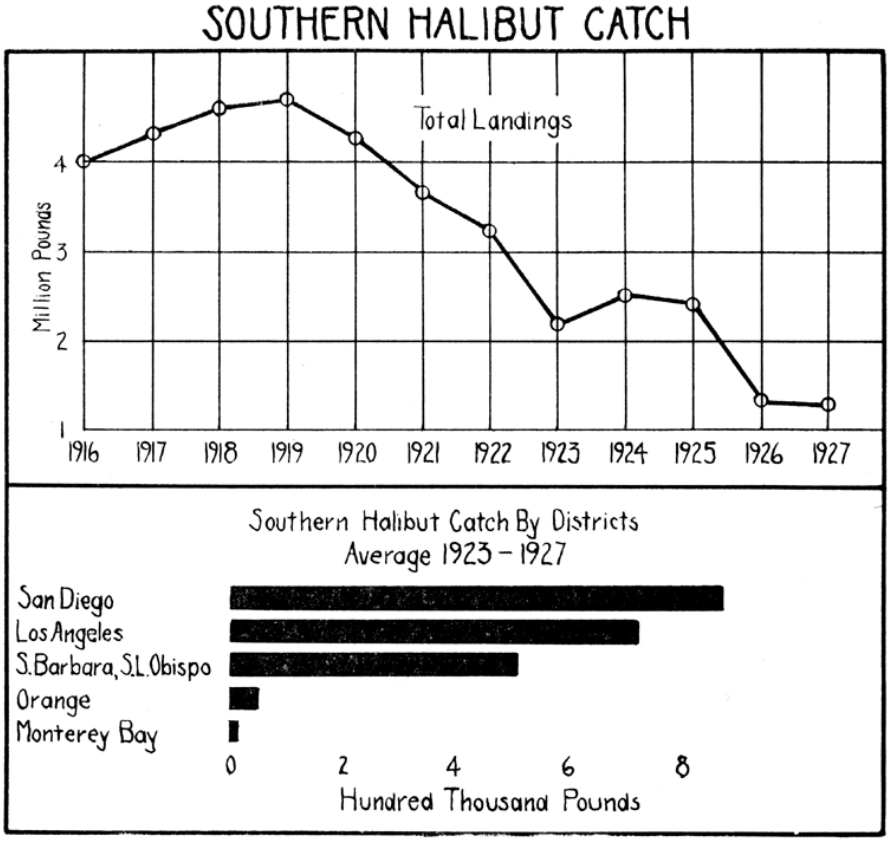

FIG. 19. Upper graph, trend of total landings (including landings from Mexico) of southern halibut. Lower graph, 5 years' (1923-1927) average annual catch by districts placed in order of amount.

FIG. 19. Upper graph, trend of total landings (including landings from Mexico) of southern halibut. Lower graph, 5 years' (1923–1927) average annual catch by districts placed in order of amount

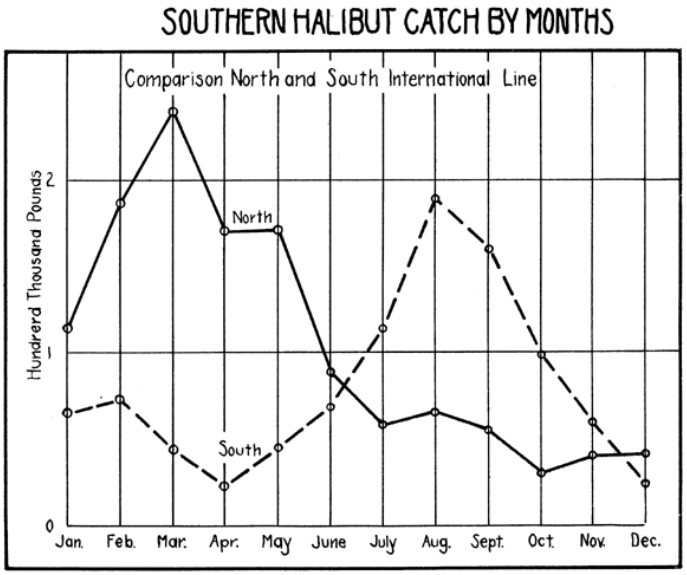

FIG. 20. Comparison of monthly catches off the coast of Mexico with those made at San Diego and Los Angeles. These monthly catches were averaged for the last eight years (1920–1927).

FIG. 20. Comparison of monthly catches off the coast of Mexico with those made at San Diego and Los Angeles. These monthly catches were averaged for the last eight years (1920–1927)

9. BARRACUDA

By LIONEL A. WALFORD

The California barracuda (Sphyraena argentea), the only representative of its family on the Pacific coast of North America is caught in abundance only south of Point Concepcion. The landings recorded north of this point are rather scattered, especially north of Monterey county, where the catches are few and small. The southernmost range of this species is Cape San Lucas, according to Jordan and Evermann in "Fishes of North and Middle America," 1896, Part I, p. 826. From the Gulf of California southward to Panama occurs Sphyraena ensis, another species of barracuda which does not reach our markets.

In figure 21, the average annual catch (for the five-year period, 1923–1927) has been obtained by districts. These "districts" are arbitrary groupings of the counties, according to their proximity to fishing ports of some importance. South of an extension of the international boundary is considered as one district; San Diego county

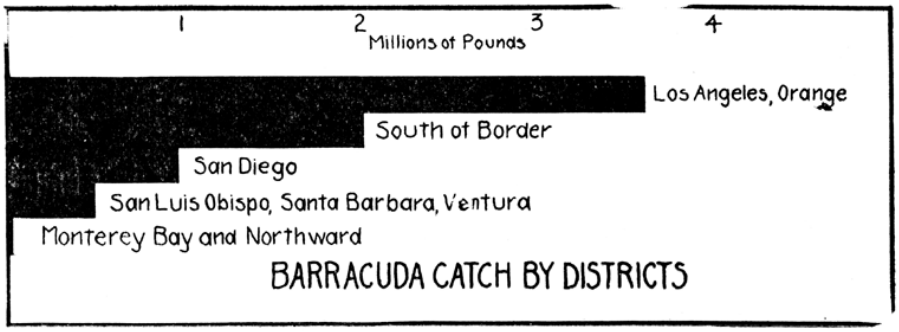

FIG. 21. Average yearly catches of barracuda by districts (for the five-year period, 1923-1927).

FIG. 21. Average yearly catches of barracuda by districts (for the five-year period, 1923–1927)

as another; Los Angeles and Orange counties combined another; San Luis Obispo, Santa Barbara and Ventura counties another; and counties from Santa Cruz northward another. This grouping of counties refers only to this section on barracuda.

It is important to remember that practically all of the barracuda from south of an extension of the international boundary are delivered cleaned, while most of the fish caught locally are delivered round. In the graphs in this section, therefore, the figures for south of the boundary are not quite comparable to the figures for local catches.

The fish which are caught in California and delivered to Los Angeles county begin to be delivered in appreciable quantities about the middle of March and continue until about the middle of October, occasional small lots being delivered during the winter months. At first the largest catches seem to be made between Los Coronados and a point midway between Oceanside and Point San Juan until about the second week in May, when most of the catches occur off Newport, Long Beach, San Pedro, Redondo and Catalina. In June and July, the fishing is carried on mostly north of San Pedro, between Redondo and Point Dume. About the first of August the gill net boats stop operating,

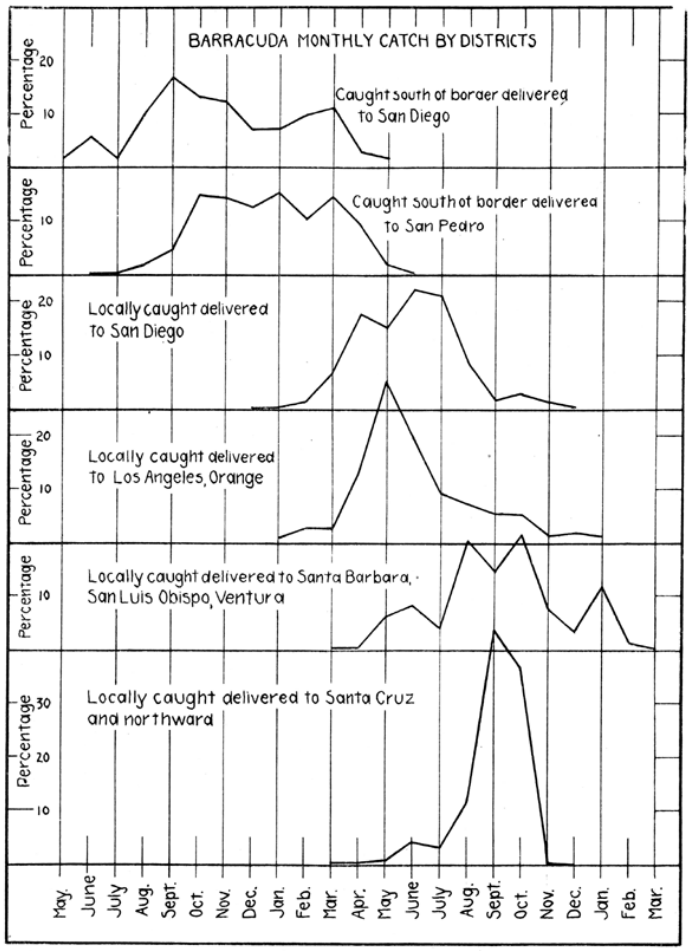

FIG. 22. Average monthly catches of barracuda expressed as a percentage of the average annual catch (five-year period, 1923-1927) for each district.

FIG. 22. Average monthly catches of barracuda expressed as a percentage of the average annual catch (five-year period, 1923–1927) for each district

and the purse seiners which have been fishing for tuna now turn to barracuda, and toward the end of August and in September are fishing off Santa Barbara, Santa Cruz Island and Anacapa. About the middle of October, fishing for barracuda in California waters practically ceases, and the purse seiners turn southward to waters south of an extension of the international boundary. The above

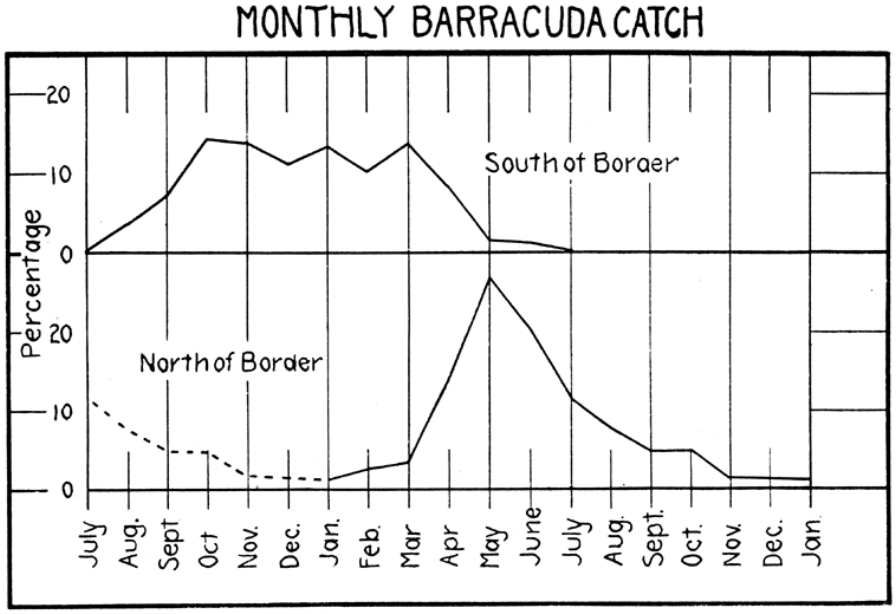

FIG. 23. Average monthly catch expressed as a percentage of the average annual catch (five-year period, 1923-1927). Contrasting the fishing seasons south and north of the United States-Mexico boundary line.

FIG. 23. Average monthly catch expressed as a percentage of the average annual catch (five-year period, 1923–1927). Contrasting the fishing seasons south and north of the United States-Mexico boundary line

information has been obtained by questioning fishermen as they landed their catches, and must, of course, be taken somewhat critically. Tage Skogsberg, (State of California Fish and Game Commisison, Fish Bulletin No. 9, p. 34) presents practically the same observations. The inference we would draw is that the fish are caught farther north as the season progresses.

Figure 22 seems to substantiate this idea somewhat. The average monthly catch (for the five-year period, 1923–1927) for each district has been obtained, as well as the average annual catch for each district. The average monthly catches for any one district have then been plotted as a percentage of that district's average annual catch. It should be borne in mind that these figures are in percentages and do not show relationships between districts as to pounds caught. Figure 21 supplements this graph by comparing the catches expressed as pounds.

Through the winter the purse seine boats bring barracuda into local ports from waters south of an extension of the international boundary. In 1927, the first boats left for these waters about October seventh.

In figure 23, the figures were obtained as in figure 22, except that in this case but two districts were used. Catches made south of the Mexican border, as one district, are contrasted with all catches made

off the coast of California. The difference between the fishing seasons for the two regions is clearly shown.

In figure 24, the combined catches of all barracuda delivered to California ports are shown from 1916 to 1927. The growth of local population, and improved methods of exploitation, refrigeration and transportation have contributed to making an appreciable increase in the total catch of barracuda and in its importance as an article of food.

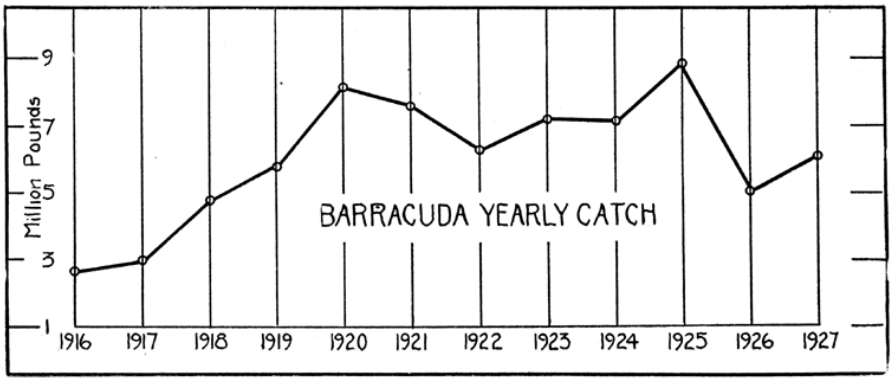

FIG. 24. Yearly barracuda landings in California. These include catches made off the coasts of both Mexico and California.

FIG. 24. Yearly barracuda landings in California. These include catches made off the coasts of both Mexico and California

10. MACKEREL

By RICHARD S. CROKER

The common mackerel (Pneumatophorus japonicus diego, formerly Scomber japonicus) is found all along the California coast, but is abundant only from Monterey Bay southward, and is very plentiful a short distance off the southern California shore. In the commercial catch a four pound fish is large, most of the fish weighing two pounds or less. Its light tackle sporting qualities are excellent as it will strike readily and fight gamely. The flesh is firm and of good taste, although its darkness may prejudice some people against it. There are few bones and little viscera. Like the tunas, the mackerel is "all meat."

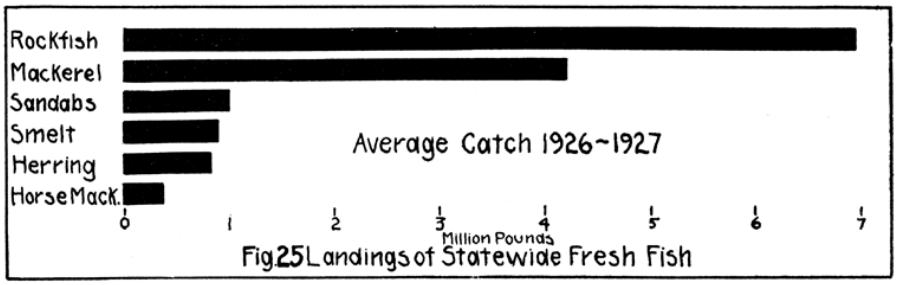

Fig 25 Landings of Statewide Fresh Fish

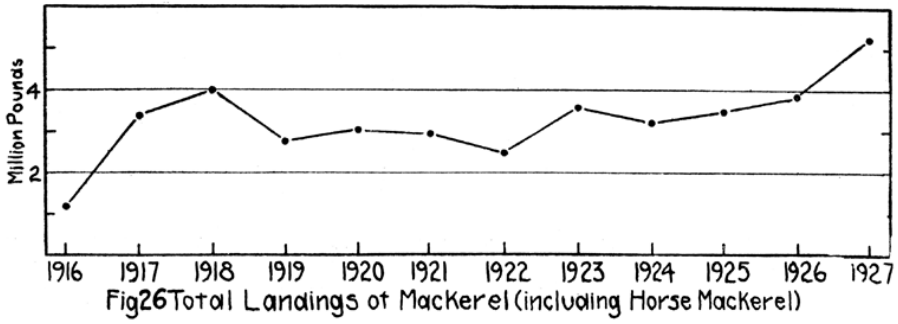

Fig 26 Total Landings of Mackerel (including Horse Mackerel)

The mackerel is often confused with the horse mackerel (Trachurus symmetricus) because of the similarity of name. The two fishes are really not at all alike, and belong to two different families of fishes. The mackerel is a member of the family Scombridae, whereas the horse mackerel is one of the related family Carangidae. At San Pedro the horse mackerel is wrongly called Spanish mackerel because of the coarseness implied by the term "horse." As a matter of fact, the flesh of the horse mackerel is declared by many to be superior to that of the mackerel. Horse mackerel usually commands a higher price and is in greater demand at the metropolitan markets. Owing to the similarity of name, it has been difficult to keep the two fishes separate in compiling catch figures, and until the end of 1925 the two were included under the one classification, "mackerel." The relative importance of the mackerel and horse mackerel catches is shown in figure 25, which compares certain fishes sold exclusively to the fresh fish markets. Almost

all the horse mackerel is landed at San Pedro and Monterey and sold to the Los Angeles and San Francisco markets.

The demand for mackerel has always been considerable in California. At San Francisco mackerel has been especially esteemed, and the Monterey fishermen usually are able to dispose of all they can catch. In the south the demand has not been so great, possibly because of the abundance of higher priced fish, and because a common fish is often unjustly despised. As a consequence, the southern California supply

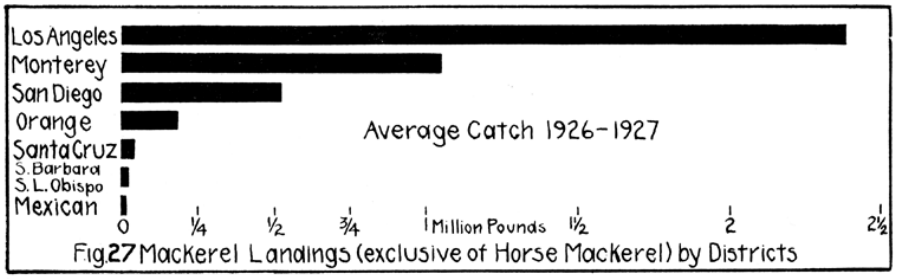

Fig.27 Mackerel Landings (exclusive of Horse Mackerel) by Districts

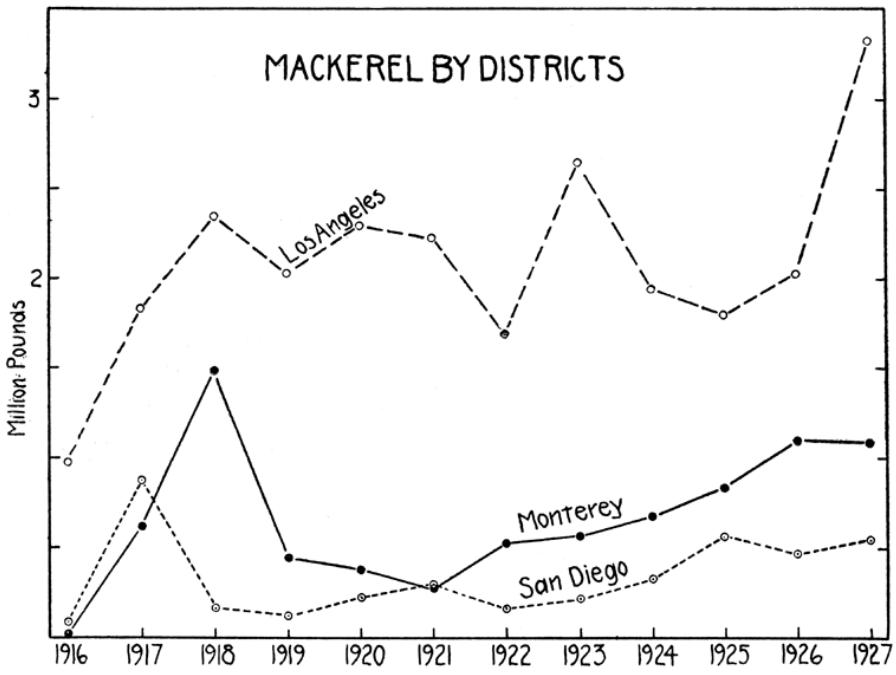

FIG. 28. Annual mackerel catch (including horse mackerel) for three districts.

FIG. 28. Annual mackerel catch (including horse mackerel) for three districts

of mackeral has scarcely been tapped. In the last few years the demand has increased, and with it the catch, as shown by the accompanying curve (Fig. 26). Mackerel now ranks sixth among the market fish of the state, and is steadily gaining on the leaders.

Until 1928 nearly all the mackerel caught was consumed fresh. Some has been dried and salted, but results have not been entirely satisfactory. Fresh, salted and dried it is used mostly as food, but some is utilized as bait. From time to time small amounts of mackerel

have been canned, but in the past the pack has not met with ready sale. During 1927 and 1928, however, large amounts have been canned with great success. Because of this recent activity in the canning of mackerel the catch for 1928 will show a great increase over former years.

The three leading mackerel districts are Los Angeles, Monterey and San Diego (Fig. 27). The fish landed at San Pedro is consumed in Los Angeles, the Monterey fish is shipped to San Francisco, and the San Diego catch is consumed locally. Scattered shipments are made from all three points, so that mackerel can be purchased in many interior towns. After a war time peak and subsequent drop in catches at the three leading ports, there has been a more or less steady increase in the catch (Figs. 26 and 28). At Los Angeles the supply is large, and with the opening up of cannery operations, the catch may be expected to increase to unheard of proportions. During the summer of 1928, as many fish were brought in nearly every day as were landed during any previous summer month. At Monterey the fishermen are

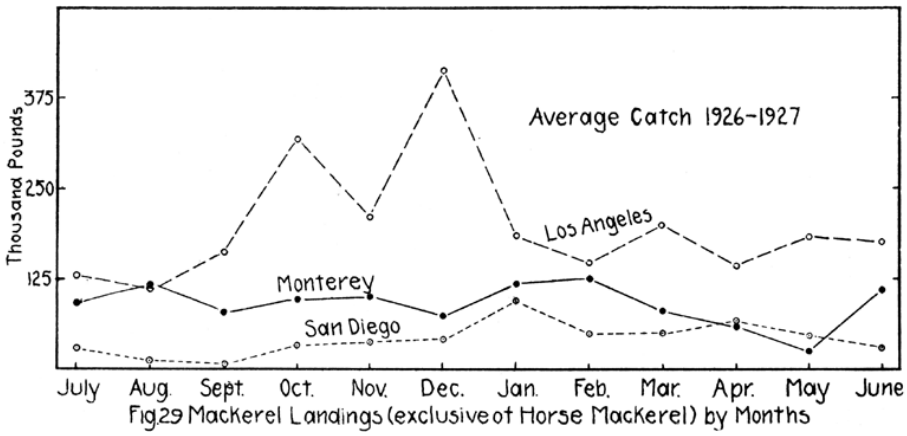

Fig. 29 Mackerel Landings (exclusive of Horse Mackerel) by Months

catching all they are able, but the catch does not seem to equal the demand. Although an effort was made to can mackerel in May and June of 1928 at Monterey, the attempt was not successful because insufficient quantities of fish were caught at that particular time to warrant running the canneries. It is expected that enough will be caught during the winter to make canning worth while.

The winter has been the best season for catching mackerel (Fig. 29). The catches at San Diego, Monterey and San Pedro are greater during this time of year than at any other. As mackerel is apparently as abundant in July as in December, the larger winter catches must be attributed to causes other than abundance. During the summer, the fisherman can make more money by catching some higher priced fish that runs only at this season. As a proof of the abundance of mackerel during the summer, the San Pedro canneries had no trouble in securing all they wanted in July and August of 1928.

Mackerel is caught by sportsmen from wharves, small boats and fishing barges. Silvery lures, snag hooks, live sardines, cut fish, and other baits are used. The commercial deliveries to the San Pedro fresh fish markets result from set line fishing, the catches seldom

exceeding one ton per boat. The catches delivered to the canneries are made with both round haul and purse seines. The "round haul" or "lampara" net is usually operated from a "bait boat," that is, a boat with a tank of live bait, and the mackerel schools are chummed up before laying out the net. The round haul fishermen frequently deliver loads upward of ten tons. Purse seiners are capable of bringing in fifty tons, but at present such catches are exceptional.

The first mackerel canning in California, of which we find a record, took place at the California Fish Company cannery in San Pedro in 1893. The mackerel was said to be too coarse and dark to make a good pack. Some horse mackerel was canned also. The fish was packed in oil in half pound square cans and in tomato sauce, mustard and souse in two pound oval cans.

The amounts of mackerel canned during the last ten years are shown in the accompanying table. Until 1928 the demand for canned mackerel has not been sufficient to make it worth while to pack on anything like a large scale. The accompanying table, showing the California pack of mackerel, has been compiled from the records of the Bureau of Commercial Fisheries.

Year	*Monterey*	*San Pedro*	*San Diego*	*Total*
1918	--	7,518	--	7,518
1919	--	9,327	83	9,410
1920	67	3,319	19	3,405
1921	--	255	--	255
1922	--	205	--	205
1923	271	--	--	271
1924	--	5,229	--	5,229
1925	--	--	--	--
1926	537	--	13	550
1927	--	10,725	236	10,961

At the present time the demand, especially in Asia, is considerable. Mackerel is expected to take the place of the cheaper grades of salmon in Java, Straits Settlements and China. There are many doubters in cannery circles, but their laments go unheeded as one cannery after another commences mackerel canning. There are some who question the quality of the pack, but their answer is the number of orders coming in daily. Practically the entire pack is now in one pound tall cans, as is the case with salmon. In the past most of the mackerel pack was in one pound oval cans as used for sardines. Improvements in methods have been made, so that the pack of today is far superior to the old product. In some of the canneries the fish are cooked in the cans only; at others the fish are cooked before being placed in the cans, and then run through the retorts in addition. There is some question as to which is the better method.

This year marks the opening of a vast new field in fisheries production. It is difficult to overestimate the importance to California of the mackerel canning industry. Canned mackerel is considered by some tastier than sardines, and is cheaper than salmon. It can be produced in large amounts to satisfy a growing market. Catching and canning it will provide useful employment for workers who would otherwise be idle during the slack periods between sardine and tuna seasons. The industry will undoubtedly be developed at the three present leading mackerel ports, San Pedro, Monterey and San Diego.

11. COMPARISON—TUNA, FLATFISH, SALMON, AND ROCKFISH

By RICHARD S. CROKER

In figure 30, a comparison is made in amounts landed of four of California's most valuable fishes. Excepting only sardines, more tuna is landed than any other fish. The next four fishes in amounts caught are the flatfish, salmon, barracuda, and rockfish. For the purposes of this comparison, under tuna are included the five California species: albacore, bluefin tuna, bonito, skipjack, and yellowfin tuna. Likewise, the flatfish include northern halibut, sole, flounders, turbot, sandabs, and southern halibut. The salmon is chiefly the one species variously known as king, chinook or quinnat, with some silver salmon and only an

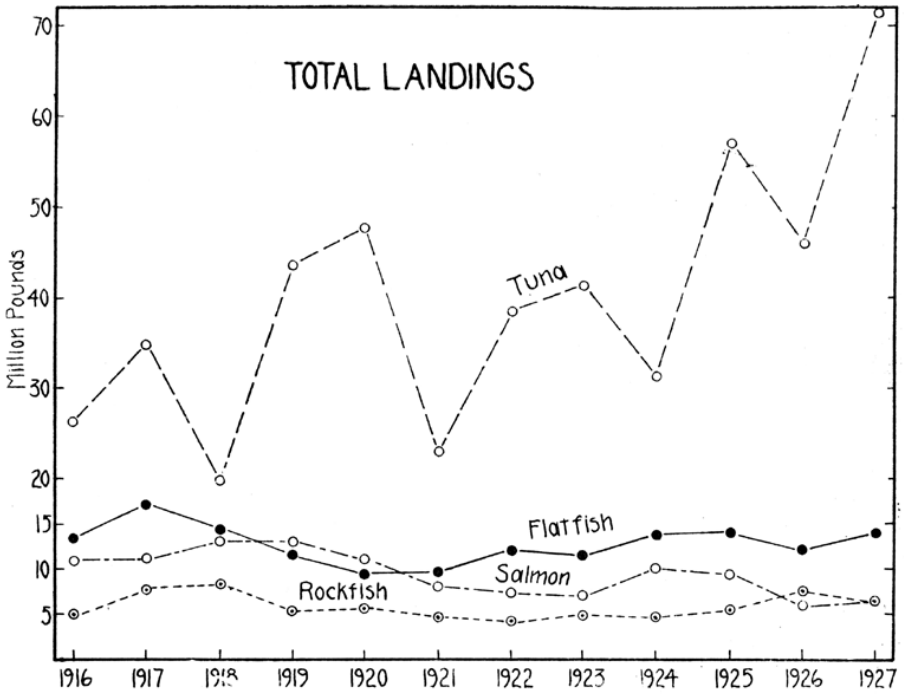

FIG. 30. A comparison of the annual catches of the five tunas, flatfish, salmon and rockfish.

FIG. 30. A comparison of the annual catches of the five tunas, flatfish, salmon and rockfish

occasional fish of other species. The classification of rockfish includes several similar species variously and locally known as bluefish, bocaccio, chilipepper, rock cod, yellowtail, and rockfish. Barracuda are discussed elsewhere and do not form a part of this comparison. The graph of figure 30 includes the fish caught off the coast of Mexico.

It may be seen that, regarding amounts landed, successive tuna seasons vary greatly, yet the trend is steadily upward. On the other hand, the salmon catch is gradually decreasing in spite of more intensive fishing. Except for minor yearly fluctuations, the flatfish and rockfish catches remain about the same. The landings of these two groups of fishes are perhaps, of all our fishes, the most reliable and constant, month by month and year after year.

Tuna, a southern fish, is used primarily for canning, but some is consumed fresh. Very little salmon is now canned in California, most of it being used fresh in the north, where it is caught or shipped south in ice. Small amounts are still mild cured. Flatfish and rockfish are the standard fresh fish of the state as a whole. Small amounts of flatfish are dried, mostly by the Chinese. Rockfish are state wide in distribution, whereas flatfish, excepting southern halibut, are mainly a northern fish.

12. TUNA SEASONS

By S. S. WHITEHEAD

Tunas are caught from Point Concepcion to Cape San Lucas, but all species are not caught throughout the entire range. Few albacore and no bluefin are caught off the coast of Mexico, while the biggest catches of yellowfin and skipjack are made south of the international boundary line. Figure 31 shows the localities and months the different tunas are caught. The months in which tunas are caught are indicated only when catches have been made consistently in that month year after year.

Cape San Lucas is the southernmost point of Lower California. Turtle Bay is approximately half way down the peninsula (see map, Fig. 32).

Yellowfin and skipjack are caught three months at Cape San Lucas with a three months' recess until the Turtle Bay season starts. Bonito is caught the year around, both in waters off the coast of Mexico and California.

	Locality	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.
Skipjack and Yellowfin Tuna	Cape San Lucas	■	■				■	■	■	■	■	■	■
	Turtle Bay to Santa Cruz Is.	■	■	■	■	■	■	■	■				■
Albacore	California	■	■	■	■	■							
Bluefin Tuna	California	■	■	■	■							■	■
Bonito	Mexico and California												

FIG. 31. White spaces indicate the months in which the tunas are caught at the different localities.

FIG. 31. White spaces indicate the months in which the tunas are caught at the different localities

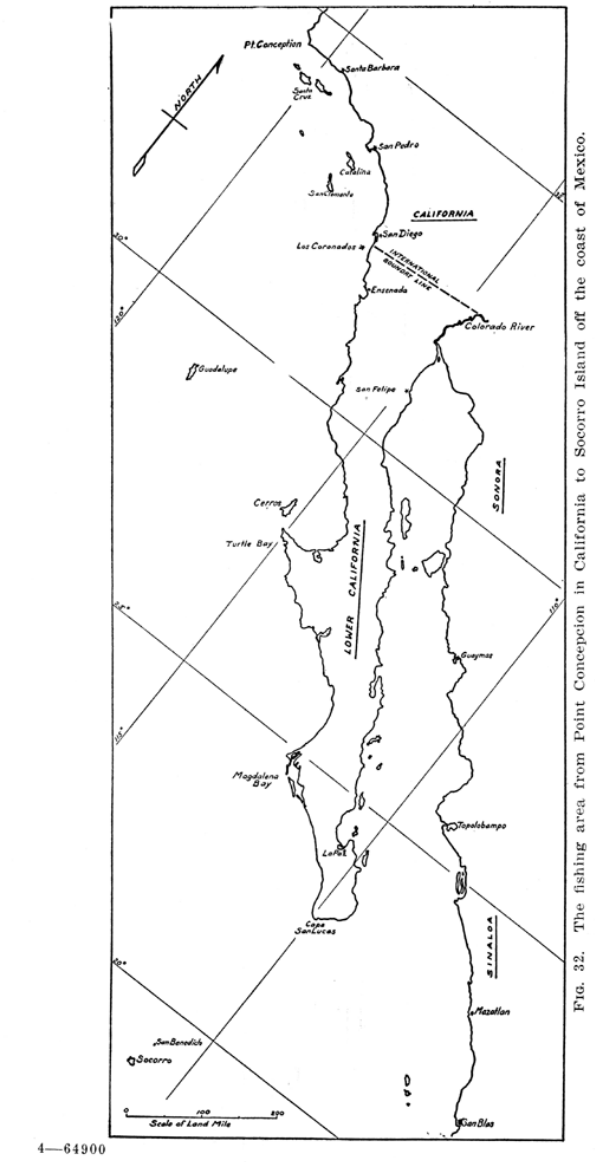

FIG. 32. The fishing area from Point Concepcion in California to Socorro Island off the coast of Mexico.

FIG. 32. The fishing area from Point Concepcion in California to Socorro Island off the coast of Mexico

13. COMPARISON OF THE CATCHES NORTH AND SOUTH OF THE INTERNATIONAL BOUNDARY

Including Fish Taken in the Territorial Waters of the United States and Mexico and on the High Seas

By GERALDINE CONNER

The fishery from Point Concepcion south to Cape San Lucas should be treated as a unit in planning for its care (Fig. 32). In spite of the fact that an imaginary line runs through it indicating that jurisdiction over a portion of it is vested in two governments, the species composing this fishery are limited only by the laws of nature in their movements and habitat. However, with its rapid development and general trend toward the south, international problems of ever increasing importance are presented, and for this reason the separation of the statistics of the fishery into two classifications, north and south of the international boundary between the United States and Mexico, is of interest.

Aside from the fish used by two small canneries in Mexican territory and a negligible amount consumed by the people on the sparsely populated coast of the Lower California peninsula, the bulk of the catch from south of the line is delivered to ports in the State of California for use in the canneries or distribution to the fresh fish markets in the United States. Practically the entire fishery in Mexican territorial waters and on the high seas south of the international line is being exploited by United States citizens or fishermen whose boats fly the American flag. This unbalanced condition has naturally brought about the chief complexities in law enforcement and collection of statistics. The accuracy of the catch figures may have been affected but the totals are sufficiently dependable to show the yearly catch trends and to bring out the general points of interest.

Specific areas of the coastal waters are under the direct control of either Mexico or the United States, but in making comparisons of the quantities of fish landed in the State of California from north and south of the boundary the entire catch is considered and not the fish from these controlled waters alone. Therefore, the figures representing catches from south of the boundary include fish taken on the high seas as well as in Mexican territorial waters.

The fish canning industry in southern California was developed and grew to large proportions as an emergency food supply measure during the World War. Prior to the time it became of marked importance, the fishing areas south of the international line were drawn upon only for supplies for the fresh fish markets during the off season on local fish. But with the growth of the tuna canning industry the local supply of albacore and bluefin tuna was insufficient to fill the demand and the canners and fishermen prepared to go farther afield for cannery varieties. Skipjack and yellowfin tuna were abundant to the south and farther off shore but to secure any quantity from the distant fishing grounds involved large expenditures for suitable boats and equipment and a general readjustment to meet the new order. Larger boats were required to make the one thousand mile trip to Cape

San Lucas along a coast where it is practically impossible to obtain supplies of fresh water or food for the crews, ice to preserve the fish in the warm climate or fuel for the engines. When small boats formerly used locally were taken to the distant fishing grounds, is was necessary that they be accompanied by large tender boats to keep them supplied with fresh water, provisions, ice and fuel and to which they could deliver their catch. The tenders made the long haul at regular intervals to the California canneries at San Pedro and San Diego with the fish.

It has taken some time to prepare for operations on fishing grounds far to the south and a considerable distance off shore. Although the total catch of fish from south of the line has been gradually increasing it was not until 1927 that the rise was of marked importance (Fig. 33). For the first time in history over 50 per cent of the landings in California ports, exclusive of sardines, mollusks and crustaceans, has been from south of the international line. Sardines are excluded from

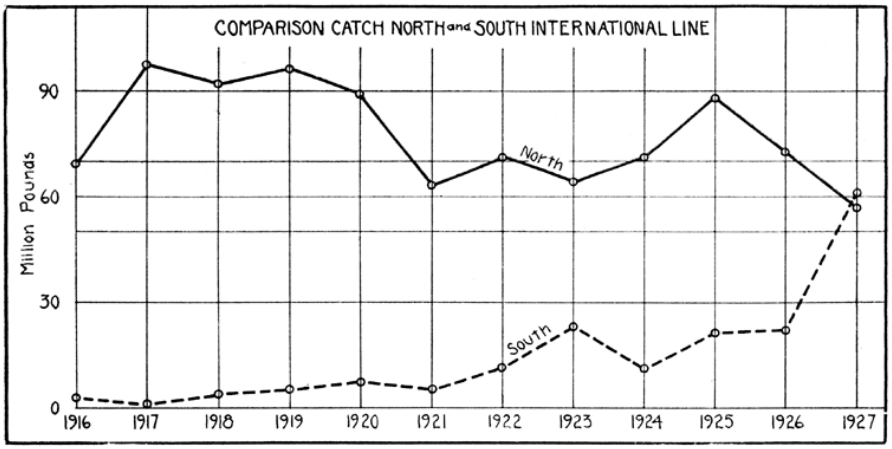

FIG. 33. Comparison of landings (exclusive of sardines, mollusks and crustaceans) in California ports from north and south of the international boundary.

FIG. 33. Comparison of landings (exclusive of sardines, mollusks and crustaceans) in California ports from north and south of the international boundary

these computations since they are not taken in quantities for commercial purposes below San Diego, whereas the amounts taken in California waters are so great that the figures are not comparable with the totals of other species. (For sardines, see Fig. 9.) The northern totals, used in figure 33, however, do include such species as salmon, striped bass and shad which are not taken south of the line.

The average from south of the boundary for the six year period from 1916 to 1921 was only 5 per cent of the total landings in California ports, while the next six year period, 1922 to 1927, jumped to 24 per cent. This rise was chiefly due to the 52 per cent for the single year of 1927 (Fig. 34).

For a better picture of the fishery from Point Concepcion south to Cape San Lucas, which is composed of practically the same species throughout, a comparison has been made of the two following groups of landings in California ports—the landings from south of the boundary; with those from the waters adjacent to the southern part of California, that is, from San Luis Obispo south to the Mexican line. Figure 35

shows the trend for the southern part of the state to be practically the same as that for the state as a whole (Fig. 33) but naturally on a lower level. The marked rise in the 1927 catch from south of the international line is again the striking feature, the 61,000,000 pounds bringing the catch for the first time above that for the southern part of the State of California. The 35,000,000 pounds taken in California waters from Point Concepcion to the Mexican line was slightly more than half the amount brought from south of the boundary. Again these figures are exclusive of sardines, mollusks and crustaceans.

Although the fresh fish landings from south of the line show little fluctuation in yearly totals during the past twelve-year period (Fig. 36), there is a great difference in their importance as compared with the total catch (Fig. 37). In the earlier years from 1916 to 1921,

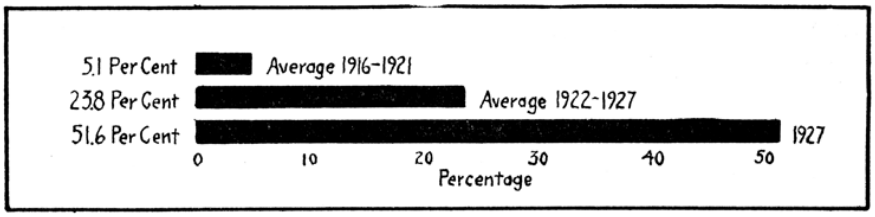

FIG. 34. Landings from south of the international boundary expressed in percentage of totals from north and south combined. (Exclusive of sardines, mollusks and crustaceans.)

FIG. 34. Landings from south of the international boundary expressed in percentage of totals from north and south combined. (Exclusive of sardines, mollusks and crustaceans.)

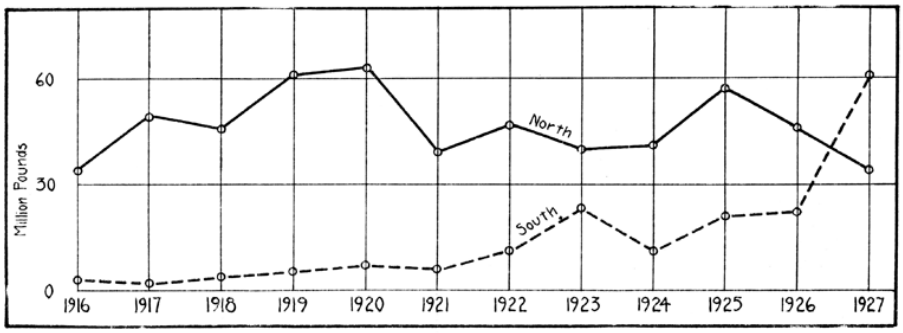

FIG. 35. Fishery from Point Concepcion to Cape San Lucas. Comparison of landings in California ports from north and south of the international boundary. (Exclusive of sardines, mollusks and crustaceans.)

FIG. 35. Fishery from Point Concepcion to Cape San Lucas. Comparison of landings in California ports from north and south of the international boundary. (Exclusive of sardines, mollusks and crustaceans.)

inclusive, the total catch showed over 85 per cent as fresh fish while for 1927 the cannery fish composed nearly 85 per cent of the catch. The total catch (Fig. 33) had increased from 3,500,000 pounds in 1916 to 61,000,000 in 1927. The general trend was upward until 1923 when the 23,000,000 pound mark was reached and a remarkable increase came in 1927 when it reached its peak.

The skipjack and yellowfin tuna catches are responsible for the marked increase in the total landings from south of the line in 1927. For this year alone they headed the list at 28,000,000 and 25,000,000 pounds, respectively (Fig. 38). These species of cannery fish were of little importance in the early history of the fishing industry south of the line. For example during the five-year period from 1916 to 1920, inclusive, yellowfin tuna ranked eighth and skipjack seventeenth in

importance, while southern halibut ranked first, the catch of that species being a little over 9,000,000 pounds for the combined five years (Fig. 39).

In a comparison of the yearly totals of the nine most important species taken south of the international boundary with the totals of the same species taken north of the line (Figs. 40 41 42 43 44 45 46 47 48, incl.) skipjack and yellowfin tuna show the marked rise in 1927. of the other

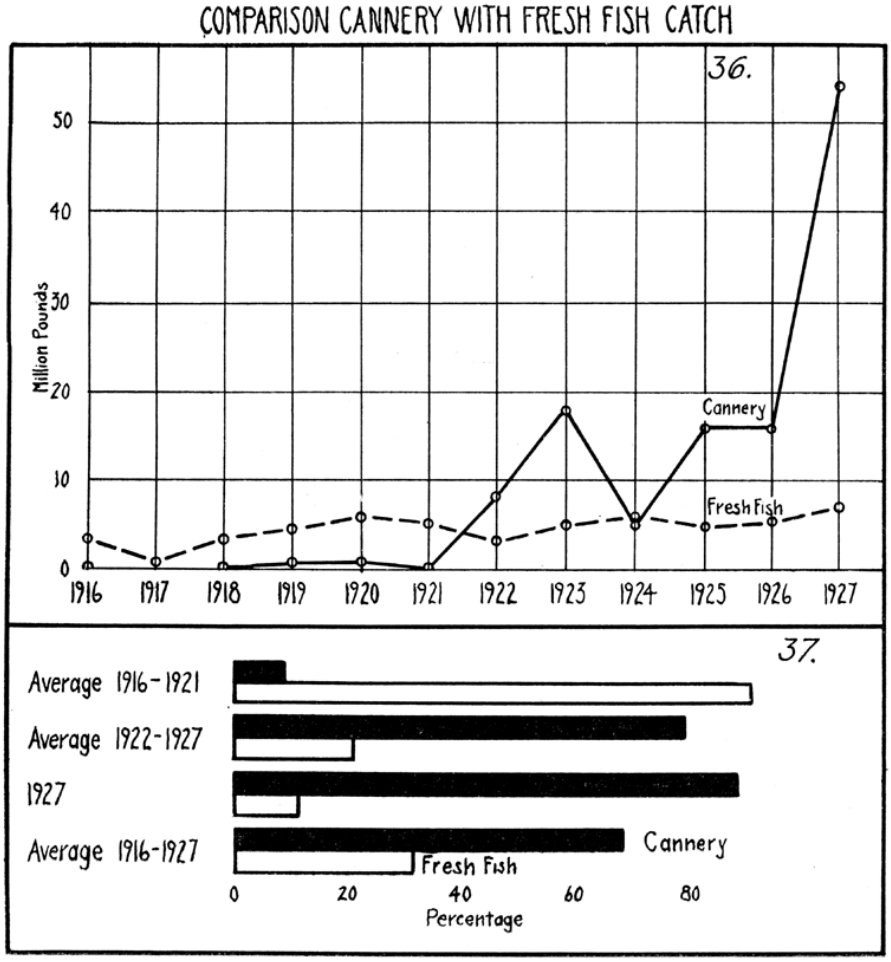

FIG. 36. Cannery fish compared with fresh fish from south of the international boundary.

FIG. 37. Percentage of cannery and fresh fish in relation to total landings from south of the international boundary.

FIG. 36. Cannery fish compared with fresh fish from south of the international boundary. FIG. 37. Percentage of cannery and fresh fish in relation to total landings from south of the international boundary

cannery varieties, the high point attained by bonito north of the line in 1926 was due to the fact that a considerable quantity of this species was canned that year. This being the first year the albacore catch failed, a special effort was made to take bonito. Only a negligible amount of albacore is taken south of the line. The albacore curve for the catch north of the line shows the very decided drop in the take of this species. This falling off of the albacore catch with the tendency

toward decline in the catch of bluefin tuna is responsible in part for the added effort to take skipjack and yellowfin tuna in recent years.

of the varieties delivered to the fresh fish markets, yellowtail, barracuda, white sea bass and southern halibut all show a tendency to decline north of the line while south of the boundary, southern halibut is the only species which has a parallel decline with the curve for the California catch. This is of interest since, as stated above, in the

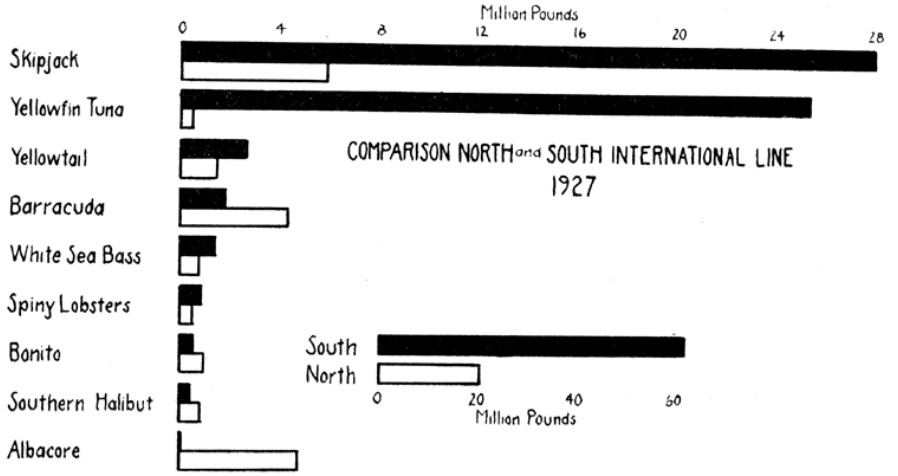

FIG. 38. Array of nine most important species from south of the international boundary landed in California ports during 1927 and comparison of amounts of same species taken north of the international line during that year. (Abalones not included.) The insert is the sum of the nine species given above.

FIG. 38. Array of nine most important species from south of the international boundary landed in California ports during 1927 and comparison of amounts of same species taken north of the international line during that year. (Abalones not included.) The insert is the sum of the nine species given above

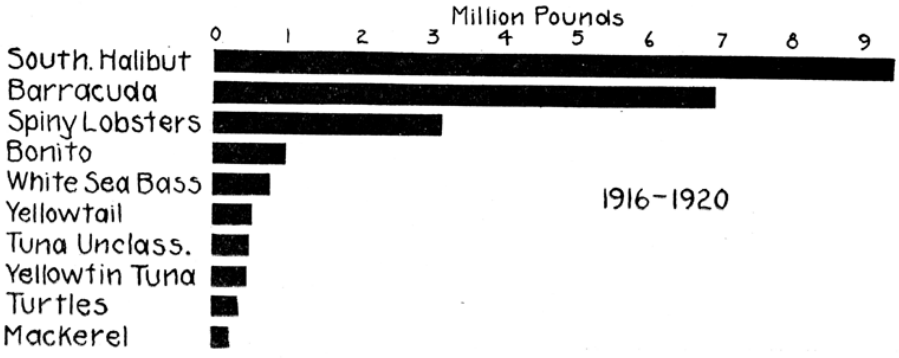

FIG. 39. Array of ten most important species from south of the international boundary landed in California ports during the five-year period, 1916-1920, inclusive. (Exclusive of abalones.) The figures represent the total for the five-year period and not the average.

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earlier years southern halibut headed the list in importance among the species brought from south of the line (Fig. 39). Yellowtail from south of the boundary shows an increase. Barracuda has held about an even keel. The white sea bass totals, which have been erroneously augmented by figures covering totuava and corvina from the Gulf of California, show a trend upward.

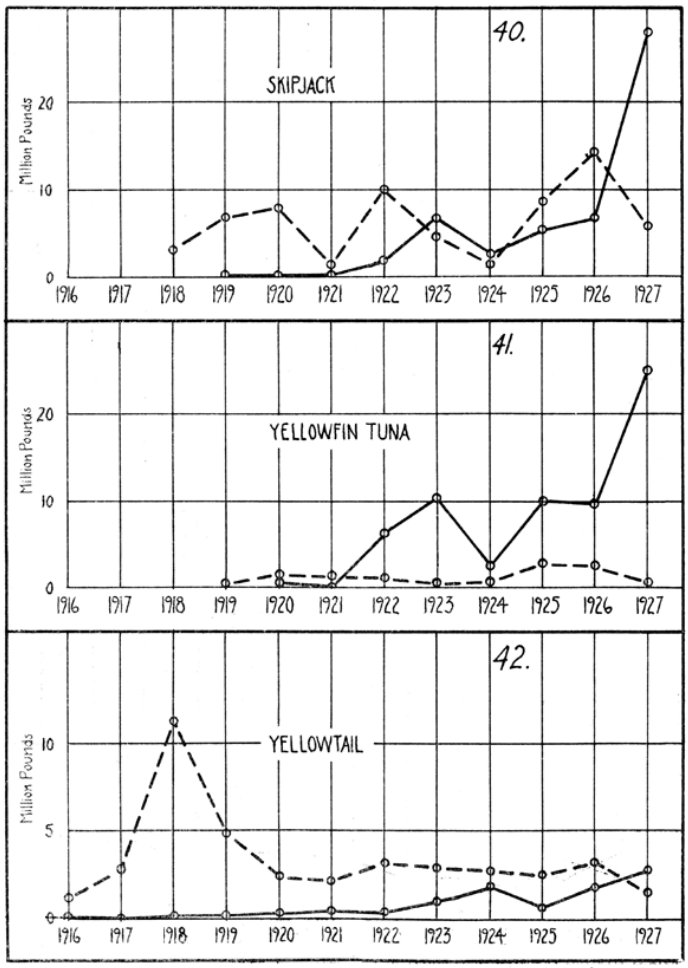

FIG. 40. Comparison of total landings of skipjack from south of the international boundary with total catch north of the line. South shown by solid line, north by broken line.

FIG. 41. Same for yellowfin tuna.

FIG. 42. Same for yellowtail.

FIG. 40. Comparison of total landings of skipjack from south of the international boundary. with total catch north of the line. South shown by solid line, north by broken line. FIG. 41. Same for yellowfin tuna. FIG. 42. Same for yellowtail

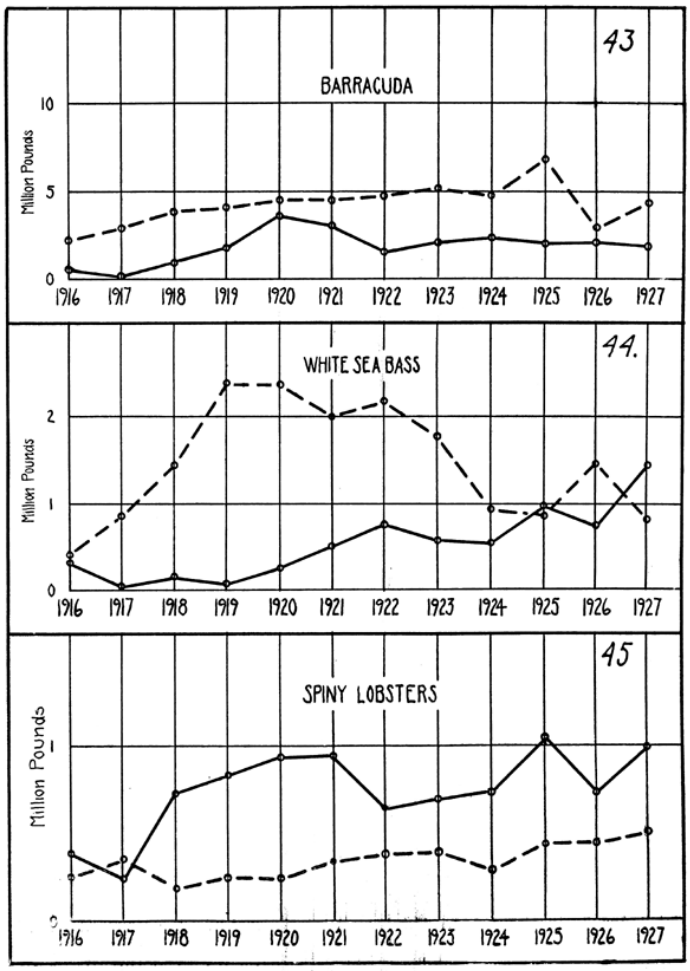

FIG. 43. Comparison of total landings of barracuda from south of the international boundary with total catch north of the line. South shown by solid line, north by broken line.
FIG. 44. Same for white sea bass.
FIG. 45. Same for spiny lobsters.

FIG. 43. Comparison of total landings of barracuda from south of the international boundary with total catch north of the line. South shown by solid line, north by broken line. FIG. 44. Same for white sea bass. FIG. 45. Same for spiny lobsters

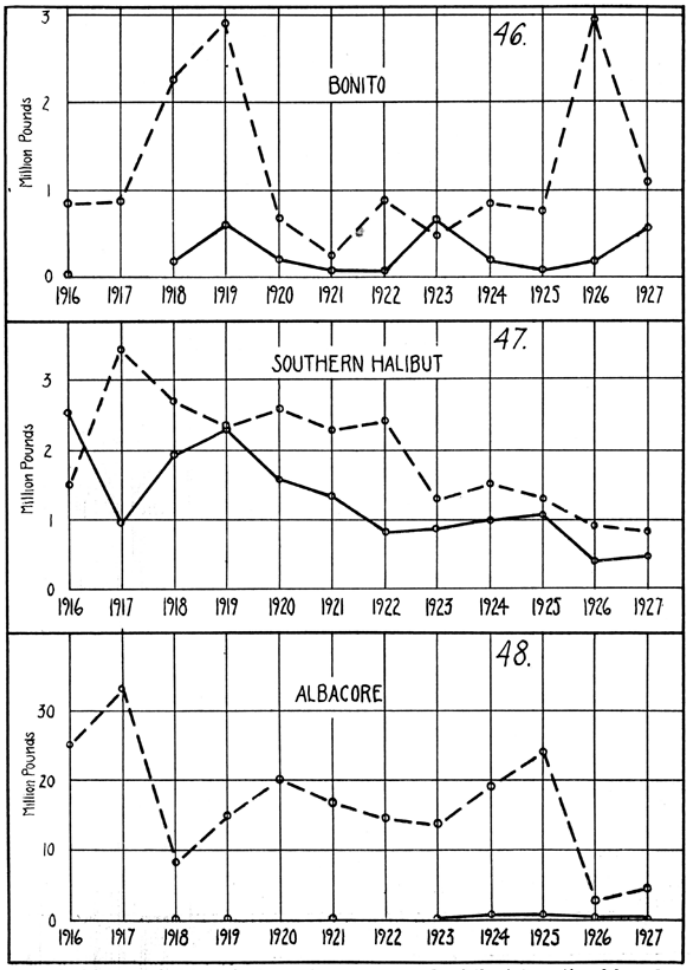

FIG. 46. Comparison of landings of bonito from south of the international boundary with catch north of line. South shown by solid line, north by broken line.
FIG. 47. Same for southern halibut.
FIG. 48. Same for albacore.

FIG. 46. Comparison of landings of bonito from south of the international boundary with catch north of line. South shown by solid line, north by broken line. FIG. 47. Same for southern halibut. FIG. 48. Same for albacore

Since the inauguration of our catch records, spiny lobsters have always been taken in greater quantities in Mexican waters with the exception of the year 1917. Although the bulk of the lobster catch is brought to California markets by tenders flying the American flag, the lobster and abalone fisheries are unique since most of the fishermen engaged in their exploitation are Mexicans or Japanese operating under concessions from the Mexican government. These fisheries are in the shoal waters along the coast, entirely under the jurisdiction of Mexico, and to engage in them requires little expenditure for equipment.

The abalone should be included among the important species from south of the line but at this time we hesitate to place it, since difficulty

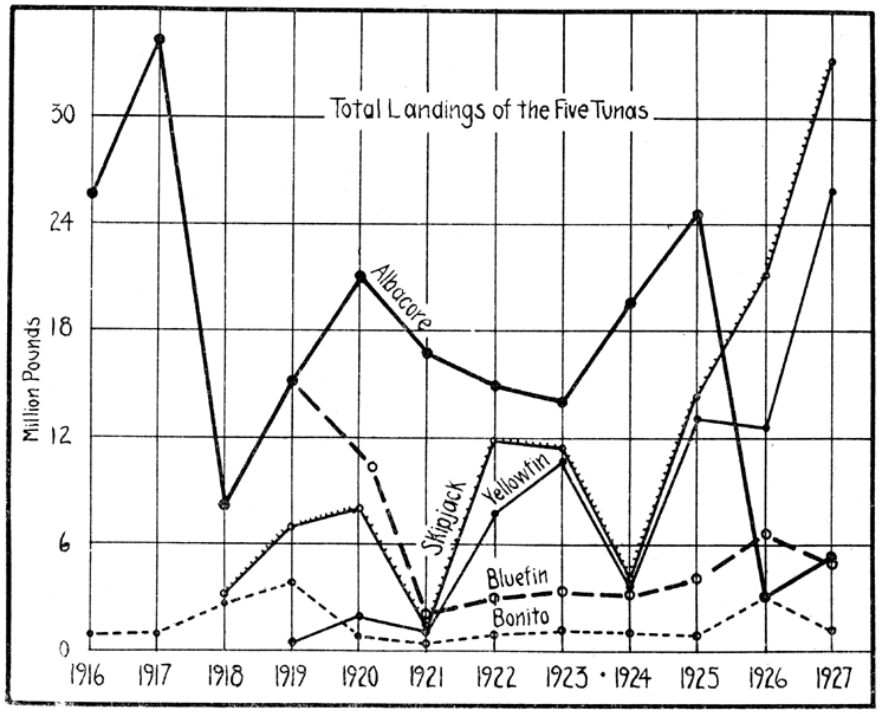

FIG. 49. Total landings of the five tunas in California ports. Fish from both north and south of the international boundary included. Ten per cent added to albacore figures to cover cleaning.

FIG. 49. Total landings of the five tunas in California ports. Fish from both north and south of the international boundary included. Ten per cent added to albacore figures to cover cleaning

has been experienced in getting accurate figures of the take. In the earlier years abalone importations were reported in figures covering wet weight with the shells, fresh abalone without the shells, canned, and dried, and until a careful analysis can be made of the records and the correct percentages of difference in weight determined, it can not be allotted its proper place. In recent years large quantities of dried abalone have been brought from the Mexican camps to California ports for reshipment to the Orient.

Turtles also formed an important item in the list of importations from Mexico in the earlier years.

In charting the total landings in California of the five tunas (Fig. 49), the effect is plainly shown of the heavy drain on the locally caught

species through the intensive fishing since the development of the tuna canning industry. When the local varieties failed to supply sufficient amounts to meet the cannery demand, skipjack and yellowfin tuna from south of the international boundary were supplemented. In a twelve year period from 1916 to 1927, inclusive, albacore has descended from a 34,000,000 pound peak in 1917 to a 3,000,000 pound catch in 1926 with intervening fluctuations from 8,000,000 to 24,000,000 pounds. The albacore in most cases is brought in to the canneries cleaned, the exception being that which is caught very close to the point of delivery. To cover the cleaning loss, not accounted for in our printed tables, 10 per cent has been added to the albacore figures used in making the graphs.

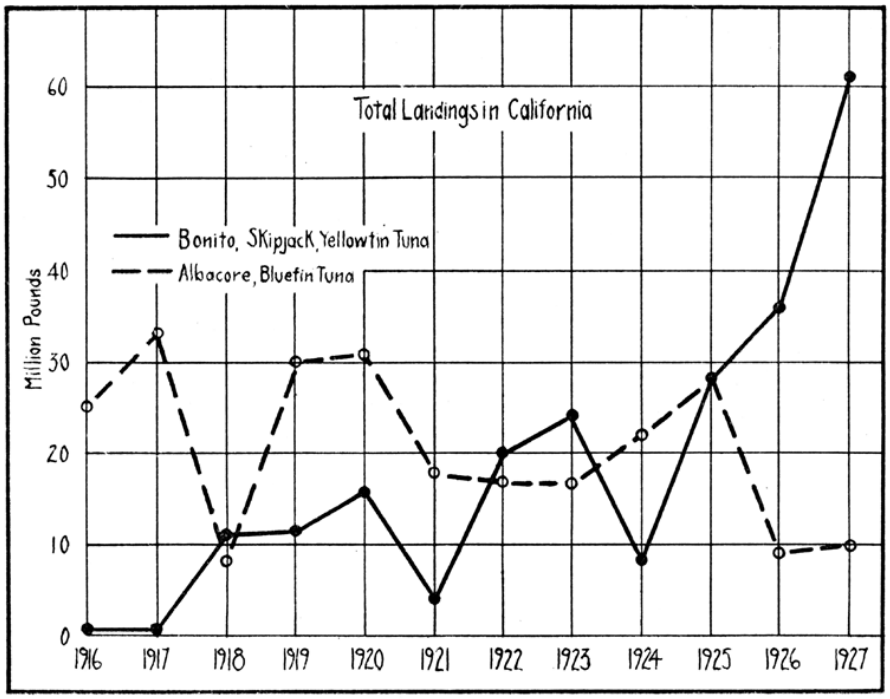

FIG. 50. Comparison of total landings of albacore and bluefin tuna with total landings of bonito, skipjack and yellowfin tuna. Fish from both north and south of the international boundary included.

FIG. 50. Comparison of total landings of albacore and bluefin tuna with total landings of bonito. skipjack and yellowfin tuna. Fish from both north and south of the international boundary included

Bluefin tuna landings which dropped from a 15,000,000 pound peak in 1919 to a low point of 2,000,000 pounds in 1921 gradually worked up to 6,500,000 pounds in 1926 and 5,000,000 pounds, or one-third of the peak, in 1927.

On the other hand, skipjack landings have risen from approximately 3,000,000 pounds in 1918 to 34,000,000 pounds in 1927, with fluctuations in the intervening years. Skipjack reached a 7,000,000 pound point in 1920, dropped to a 1,000,000 pound low point in 1921, rising once more to 12,000,000 pounds in 1922 and falling to 4,000,000 in 1924, from which time it rose steadily to the great peak it finally attained in 1927.

Yellowfin tuna shows an equally impressive rise from less than 1,000,000 pounds in 1919 to 26,000,000 pounds in 1927. Its fluctuations

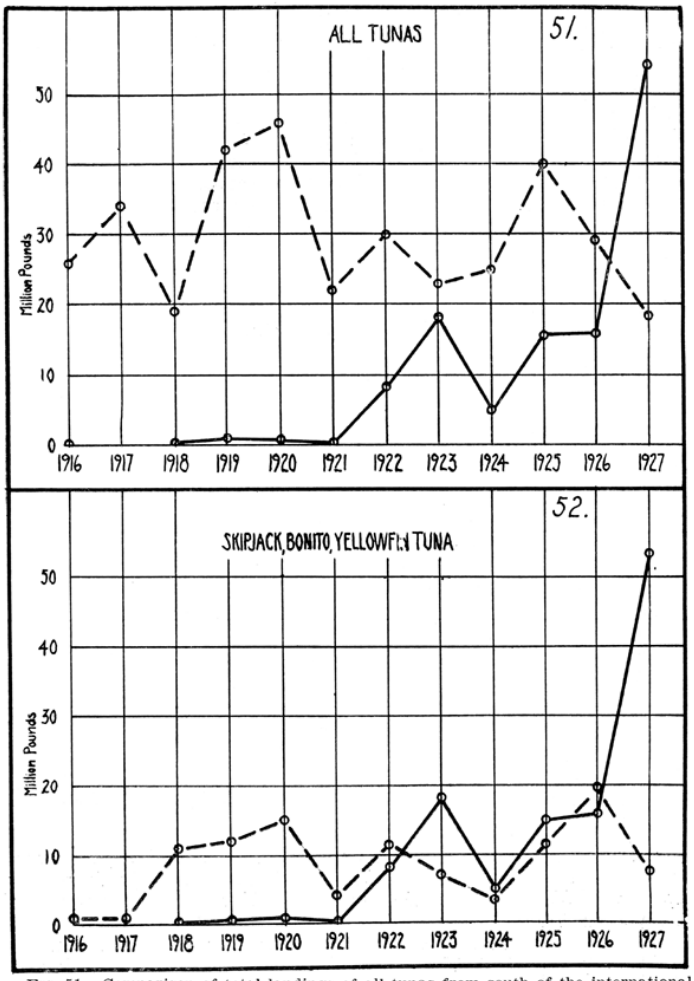

FIG. 51. Comparison of total landings of all tunas from south of the international boundary with total landings of all tunas from north of the line. South shown by solid line, north by broken line.

FIG. 52. Comparison of total landings of skipjack, yellowfin tuna and bonito from south of the international boundary with total landings of same three species from north of the line. South shown by solid line, north by broken line.

FIG. 51. Comparison of total landings of all tunas from south of the international boundary with total landings of all tunas from north of the line. South shown by solid line, north by broken line. FIG. 52. Comparison of total landings of skipjack, yellowfin tuna and bonito from south of the international boundary with total landings of same three species from north of the line. South shown by solid line, north by broken line

from 1921 to 1925 are about the same as those of the skipjack. However, instead of following the skipjack on its shoot upward, the yellowfin lagged from 1925 to 1926. In fact the total yellowfin catch for 1926 was 1,000,000 pounds less than it had been for 1925. But in 1927 it resumed its marked upward course along with the skipjack.

Bonito has not played a very important role as yet.

In spite of the upward trend of certain species there is unmistakably need of careful study as a basis for the formulation and enforcement of conservation measures which will prevent other species of tuna from following the albacore in its downward course to a point far below the danger mark.

Bluefin tuna and the bulk of the albacore are taken north of the international line. Yellowfin tuna and skipjack are caught in greater abundance off the coast of Mexico. A comparison has been made of the total landings in California of a combination of the yellowfin, skipjack and bonito with the total landings of the albacore and bluefin combined (Fig. 50). The 1927 peak of 61,000,000 pounds for yellowfin, skipjack and bonito far exceeds the peak of any year's total for albacore and bluefin. The 35,000,000 pound peak for the albacore-bluefin curve comes in 1917 when no bluefin was reported so that the total was for albacore alone, and it is slightly more than half the amount shown in the peak for the yellowfin-skipjack-bonito curve. There is a downward trend in the albacore-bluefin curve while the skipjack-yellowfin-bonito trend is steadily upward with a jump to great height in 1927.

A comparison of the yearly totals of all tunas from north of the line with yearly totals of all tunas from south of the line (Fig. 51) also shows the decline in the northern fishery, influenced chiefly by the albacore figures and the steady rise of the southern fishery due to the skipjack and yellowfin increases. This comparison also emphasizes the great jump to a 54,000,000 pound peak in 1927 when the southern fishery exceeded the northern fishery for the first time. The 1927 southern peak was 7,000,000 pounds greater than the northern peak for 1920 and 37,000,000 pounds greater than the northern catch for 1927.

The combined landings of skipjack, yellowfin tuna and bonito (Fig. 52) from north of the international boundary as compared with the combined landings of these same species from south of the line show considerable fluctuations in the catches of northern fish. The trend is upward with a falling off from the peak of 20,000,000 pounds in 1926 to 7,500,000 in 1927. From south of the line the upward trends are decided from 1921 to 1923 where an 18,000,000 pound point is reached and from a low 5,000,000 pound point in 1924 there is an upward shoot to a peak of 54,000,000 pounds in 1927.

In 1927 a new source of supply was established when approximately 78,000 pounds of albacore were imported from Japan as an experiment, and canned in the southern California plants. The Orientals prefer the darker meated varieties and for this reason the white meat of the albacore sold low enough to permit a trial shipment in ice to be made to the tuna canneries in southern California. The experiment proved successful and during the first six months of 1928 approximately

4,000,000 pounds were imported from Japan while in June and August 20,000 pounds of albacore were brought from the Hawaiian Islands.

The tuna canning industry is becoming yearly more dependent on the supply of fish obtainable from distant fishing grounds and especially those to the south in Mexican territorial and extraterritorial waters and on the yet undeveloped marine regions even farther south along the coast of the mainland of Mexico and beyond the Socorro Islands in the Pacific. In the near future it is possible this fishery will be extended even to the waters of Central America. Boat building concerns in southern California are even now drawing plans for steel and wooden framed refrigerated fishing boats of sufficient size, fuel and water carrying capacity, to make the longer trips.

It is, therefore, to the best interests of both the United States and Mexico to closely cooperate in solving the problems of protection and wise use of the fisheries: The United States to protect a food supply for her people and a California industry involving large investments and the employment of many citizens, from failure through depletion of the desirable species or unreasonable duty requirements by other countries; Mexico to protect her marine life, to continue to hold the market for her unused raw materials and to assure the continued collection of revenue from her natural resources.

The records, serving as a basis for this discussion, will be suject to additions at a future time when an audit of the company books of certain canneries has been completed. It has been found that the quantities of tuna brought up from south of the Mexican border are somewhat greater than shown in our records, but it is probable that the additions will be insufficient to affect the validity of any of the conclusions here drawn.

San Pedro, California, October, 1928.

Supplementary Note:

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14. TABLES SHOWING THE MONTHLY CATCHES LANDED IN CALIFORNIA BY DISTRICTS FOR THE TWO CALENDAR YEARS 1926 AND 1927

These tables are compiled from the records of the Bureau of Commercial Fisheries of the Division of Fish and Game of California. The fish brought into California from the high seas off the coast of Mexico and from the territorial waters of Mexico are included in these figures. Certain fishery products counted rather than weighed were converted to pounds by using the following factors:

Crabs, one dozen	24 pounds
Frogs, one dozen	4 pounds
Terrapins, one dozen	24 pounds
Eastern oysters, one hundred	22 pounds
Ecrevisse, one dozen	3 pounds

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Eastern oysters, one hundred ..... 22 pounds
Ecrevisse, one dozen ..... 3 pounds

DEL NORTE AND HUMBOLDT COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Cultus Cod		93	470	142	4,951	3,852	7,716	10,741	2,543	242	54	27	30,831
Flounders	4,229	11,458	4,023	598			300				383	1,875	22,866
Halibut					53,159	40,560	39,478	31,491	37,217	15,793	14,474		232,562
Herring	2,480		3,695									626	6,801
Mackerel		50	328										378
Perch	1,170	3,564	3,916	4,750	5,130	5,726	1,939	3,377	593		274	790	31,229
Rockfish		150	868	253	2,713	5,455	6,472	9,429	11,313	6,741	3,420		47,214
Sablefish					6,978	2,938	1,242	18,296	1,080	18,727	16,800		66,161
Salmon				83,021	592,507	515,020	278,015	860,825	383,548	43,221	69,683		2,825,840
Smelt	1,498	5,753	4,362	2,220	2,593	2,257	448	2,072	2,757	1,944	4,934	700	31,920
Sole					83	237	1,297	143					1,760
Whitebait		481	2,463	2,279	6,557	23,072	32,386	5,724	280				73,242
Miscellaneous		180	229	65			129						603
Crabs	23,760	20,688	24,216	23,232	24,864	23,832	17,376				16,968	18,144	193,080
Clams—Mixed	2,570	1,089	1,536	848					1,881	2,569	450	1,452	12,335
Cuttlefish											40		40
Totals	35,707	43,506	46,106	117,408	699,937	623,519	386,798	942,198	441,412	89,177	127,480	23,614	3,576,862

DEL NORTE AND HUMBOLDT COUNTIES
1926

DEL NORTE AND HUMBOLDT COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Cultus Cod	16	18	251	6,009	3,003	1,985	2,858	4,574	1,425	805	411	35	21,390
Flounders	6,982	8,184	5,289	698	7						184	411	21,755
Halibut		613	29,920	41,609	44,910	38,872	41,099	117,176	90,738	78,876	23,297		509,110
Herring	29,466	19,771										1,057	50,294
Perch	1,572	9,292	22,711	2,725	580	759	2,593	975	80	358	1,330	90	43,065
Rockfish		436	9,474	7,632	10,021	6,936	3,096	10,397	14,144	20,065	5,108		87,309
Sablefish		350	7,622	30,687	30,931	23,347	13,619	6,703	65,837	125,457	71,599	340	376,463
Salmon		48	10	1,642	606,338	375,291	198,134	397,706	126,768	75,435	75,079		1,856,451
Sardines									168				168
Smelt	1,637	1,525	10,343	5,520	1,437	995	92	398	4,898	6,443	1,727	190	35,205
Sole						93	129	2,896	1,020				4,138
Whitebait	1,931	7,376	10,124	20,207	38,267	17,589	13,344	3,664	224	3,311	235		101,273
Miscellaneous		150	150		143	104		497	856		25		1,925
Crabs	17,304	13,464	16,296	26,808	21,600	26,088	20,880				9,576	9,504	161,520
Abalone							39,600	46,400					86,000
Clams—Cockle				627									627
Clams—Mixed	960	1,785	1,604	1,071					1,202	2,120	1,111	1,030	10,883
Totals	59,868	63,012	113,794	145,235	742,237	492,059	335,444	591,386	307,360	312,850	191,673	12,657	3,367,575

DEL NORTE AND HUMBOLDT COUNTIES
1927

MENDOCINO, SONOMA AND LAKE COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	8,297	2,410	2,758		350								13,815
Catfish	20,752	44,655	23,870	161					938	5,250	3,571	4,662	103,859
Cultus Cod			275	3,110	165	288	1,359	4,649	301	780	8,970	390	20,287
Flounders			270	4,670						48,590	11,960	23,140	88,630
Halibut					42	8,142	12,276	1,711	46				22,217
Perch				90				200				115	405
Rockfish	5,740	4,550	2,305	2,860		680	1,091	25		781	260		18,292
Sablefish						1,370							1,370
Salmon					42,436	146,652	99,654	678,405	15,148				982,295
Sandabs	3,840	3,770	5,330	6,630	520					7,670	3,250	780	31,790
Sea Bass—White								125					125
Skates										1,300		650	1,950
Smelt							85	12					97
Sole	22,880	15,600	28,190	62,120	5,720					27,280	11,050	20,930	193,770
Striped Bass				17									17
Suckers	348												348
Miscellaneous	375	5,571	10,115		3,400								19,461
Crabs	576	864										144	1,584
Clams—Cockle						215		348	109			15	687
Clams—Mixed	219		365	284		227		334					1,429
Clams—Softshell						12	885				243	474	1,614
Totals	63,027	77,420	73,478	79,942	52,633	157,586	115,350	685,809	16,542	91,651	39,304	51,300	1,504,042

MENDOCINO, SONOMA AND LAKE COUNTIES
1926

MENDOCINO, SONOMA AND LAKE COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp			2,896										2,896
Catfish	10,863	19,597	20,106						5,090	8,084	8,076	7,396	79,152
Cultus Cod	529	130	780	520	260	4,938	14,326	19,359	408		130	1,660	43,061
Flounders	8,070		390	640	13,290				4,210	23,760	260	2,340	53,860
Halibut					11	6,960	25,094	11,621	314	4,030			48,030
Rockfish	4,760	520	1,300	910	5,648	10,494	2,057	1,048	430	1,820	1,820	5,330	37,037
Sablefish					98	3,473	2,694	9,944					16,211
Salmon					62,200	195,671	541,335	721,816	7,876				1,528,898
Sandabs	970	1,400	4,420	1,608	780				390	1,690	4,550	5,200	21,098
Skates	390												390
Smelt								100					100
Sole	44,285	8,840	26,300	28,210	11,570	236			4,680	17,160	28,290	31,290	200,861
Crabs	96											96	192
Clams—Cockle							253	335	85				673
Clams—Mixed						170	212	80					462
Cuttlefish						519							519
Totals	70,854	30,487	56,252	31,978	93,857	222,463	586,871	764,303	23,453	56,544	43,126	53,252	2,033,440

MENDOCINO, SONOMA AND LAKE COUNTIES
1927

MARIN COUNTY

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Cultus Cod				22	88	288							398
Flounders		5	25			126							156
Halibut				45	319	305							669
Herring	85	85	1,765									8,143	10,078
Perch	10,513	3,764	11,734	3,285	160		1,270	5,760	1,581	4,093	1,630	120	43,910
Rockfish					74								74
Salmon				2,434	18,601	5,048							26,083
Sardines							150						150
Sea Bass—White							10,296	13,857	18,793	358	111		43,915
Smelt	1,712	1,882	3,814	748	326	10,581	2,456	1,331	2,485	3,796	3,017	243	32,391
Striped Bass	12		954	60							115		1,141
Turbot		34	125	53	67	875	140			8	31	32	1,365
Whitebait	598	773	2,795	12						47	8		4,233
Miscellaneous											28		28
Crabs	6,528	768	288			8,088						144	15,816
Shrimps	22,837	17,907	61,306	50,565	91,940	145,229	120,196	152,845	52,436	128,762	96,766	58,630	999,419
Clams—Cockle	3,718	2,999	5,256	321	233	233	1,743		197	83	378	706	15,867
Clams—Mixed	312	458	593	3,190	5,649	3,591	577	78	629	450	1,119	1,267	17,924
Clams—Softshell	8,080	7,840	8,320	8,080	8,080	8,400	8,800	9,120	9,440	8,240	8,880	9,070	102,350
Mussels							35						35
Oysters—Eastern				1,965	1,740	2,081	2,101	2,198	2,239	3,941	4,471	5,196	25,932
Totals	54,395	36,515	96,975	70,780	127,277	184,845	147,764	185,189	87,791	150,278	116,554	83,571	1,341,934

MARIN COUNTY
1926

MARIN COUNTY

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Flounders			3										3
Halibut					44								44
Herring	900		500								82	251,378	252,860
Perch	472	1,282	18,884	15,162				1,498	142	1,276	4,670	5,076	48,162
Rockfish											102		102
Sardines						70							70
Sea Bass—White						97	2,111	5,778	5,868	1,698			15,552
Smelt	46	600	5,449	4,026	1,290	6,348	2,224	61	1,444	4,136	3,138	1,071	29,833
Striped Bass	9		41						2,724				2,774
Turbot	49	119	140	83	498	723	1,327		47		505	384	3,875
Whitebait				5									5
Crabs											1,200	912	2,112
Shrimps	43,268	27,719	57,481	55,225	75,926	119,080	92,700	119,067	154,097	185,810	125,420	126,081	1,181,874
Clams—Cockle	629	481	1,149	184	552	693	606	261			53	6	4,614
Clams—Mixed	2,722	3,847	7,241	6,096	7,385	5,093	2,557	1,857	195	2,938	3,215	4,511	47,347
Clams—Softshell	7,000	7,720	8,200	8,600	6,360	6,920	4,240	4,320	4,400	4,560	4,757	5,040	72,117
Oysters—Eastern		1,749	826	990	8,415	9,108	12,485			4,510	10,312	17,455	65,850
Totals	55,095	43,517	99,714	90,371	100,470	148,132	118,250	132,842	168,917	204,518	153,514	411,914	1,727,254

MARIN COUNTY
1927

SOLANO AND YOLO COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	446	937	1,159	36	101	11		80	12		124	534	3,440
Catfish			125	2,233	751			959	596			11	4,675
Flounders			30	17					93				140
Pike	30	8									48		86
Salmon	236	650	4,439	17,539	5,745	11,185		74,483	113,326		9,172	10,925	247,700
Shad		4	37,769	77,243							4,518	80	119,614
Striped Bass	9,393	13,566	7,165	7,934	108			2,778	665		16,364	11,287	69,260
Miscellaneous												138	138
Totals	10,105	15,165	50,687	105,002	6,705	11,196		78,300	114,692		30,226	22,975	445,053

SOLANO AND YOLO COUNTIES
1926

SOLANO AND YOLO COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	341	65	788	1,223	616	33		297	226		456	279	4,324
Catfish			1,377	5,327	3,613			3,080	1,690	1,047	847	63	17,044
Pike	95	12	39	156					6		33	21	362
Salmon	2,530	222	1,675	6,506	21,770	9,167		71,970	96,836		1,198	125	211,999
Shad	2		32,243	321,572	334,120			248	63		25		688,273
Striped Bass	4,105	1,719	9,567	18,323	11,222			11,582	2,153		3,530	2,773	64,974
Miscellaneous			10					155					165
Totals	7,073	2,018	45,699	353,107	371,341	9,200		87,332	100,974	1,047	6,089	3,261	987,141

SOLANO AND YOLO COUNTIES
1927

SACRAMENTO AND SAN JOAQUIN COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	5,263	3,849	930	1,835	99	49		102	24	16	1,429	3,436	17,032
Catfish	444	1,185	8,424	14,088	6,798			6,840	13,201	15,273	14,287	16,089	96,629
Hardhead	15,847	4,429	2,102							4,095	4,976	12,176	43,625
Pike	201	178	31	8				11		205	313	193	1,140
Salmon	231	542	22,205	25,694	96,519	23,003		88,798	156,536		10,970	10,265	434,763
Shad		156	9,307	20,979	20,853						33	7	51,335
Splittail	483	2,161	320								424	1,038	4,426
Striped Bass	14,453	21,555	18,885	47,262	2,474			564	2,055		11,173	20,707	139,108
Suckers	130	230											360
Miscellaneous			115									37	152
Totals	37,052	34,265	62,319	109,866	126,743	23,052		96,315	171,816	19,589	43,605	63,948	788,570

SACRAMENTO AND SAN JOAQUIN COUNTIES
1926

SACRAMENTO AND SAN JOAQUIN COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	3,721	9,828	7,194	484	101	256		470	955	300	2,705	3,373	29,887
Catfish	2,462	3,988	22,832	24,405	16,225			15,981	20,765	21,062	26,940	15,844	170,504
Flounders				206									206
Hardhead	5,321	5,049	1,372	64						700	8,025	12,367	32,898
Pike	170	1,021	737	376	313	30		22	8		51	95	2,823
Salmon	1,898	426	5,753	12,990	81,421	33,309		97,227	94,711		552	30	328,317
Shad		92	34,005	106,859	109,995			132	173		866	7	252,129
Splittail	3,668	2,775	448	100	15						1,103	1,003	9,112
Striped Bass	12,886	13,383	24,505	66,958	29,165			11,687	2,249		11,548	7,910	180,291
Suckers	290	42	181	251	235						5		1,004
Miscellaneous				10							350	100	460
Totals	30,416	36,604	97,027	212,703	237,470	33,595		125,519	118,861	22,062	52,145	41,229	1,007,631

SACRAMENTO AND SAN JOAQUIN COUNTIES
1927

ALAMEDA AND CONTRA COSTA COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	987	4,929	10,459	2,837	10	348		483	54		999	941	21,948
Catfish			2,203	8,352	2,386			4,147	6,280	13,145	10,779	4,922	52,214
Flounders		207	9	122							343	86	867
Herring		725									120	350	1,195
Perch			159	34							11		204
Pike	477	305	196	108		8		5	46		168	451	1,764
Salmon	294	2,422	16,194	97,599	8,785	56,747		83,585	301,543		5,752	6,422	579,313
Sea Bass—White								148	134				282
Shad	29	1,550	182,239	524,183				1,786	23		4,057	778	714,615
Smelt			404	221	408	1,286	100		49				2,468
Splittail								410	155		237	94	896
Striped Bass	37,602	70,843	114,750	55,710	5,113			59,626	13,867		35,794	41,765	435,070
Suckers											7	4	11
Whitebait			105										105
Miscellaneous		462								411			873
Shrimps			1,200	2,400	1,300	600	900	300					6,700
Clams—Softshell	8,918	9,511	10,144	10,311	8,937	9,831	7,517	9,467	8,054	7,750	5,510	2,710	98,660
Mussels					23	37							60
Totals	48,277	91,054	338,044	701,876	26,962	68,857	8,517	159,957	330,205	21,306	63,667	58,523	1,917,245

ALAMEDA AND CONTRA COSTA COUNTIES
1926

ALAMEDA AND CONTRA COSTA COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Carp	320	1,192	2,779	3,891	3,173	269	.....	4,442	2,470	31	1,409	943	20,829
Catfish	28	711	3,701	9,993	8,222	.....	.....	11,665	17,375	24,607	20,196	8,105	104,033
Flounders	.....	1,309	1,084	1,185	73	.....	.....	.....	.....	.....	36	.....	3,688
Grayfish	.....	.....	102	.....	.....	.....	.....	.....	.....	.....	.....	.....	102
Herring	.....	1,100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,100
Perch	.....	16	628	586	.....	.....	.....	.....	.....	.....	.....	.....	1,230
Pike	423	316	2,819	254	.....	.....	.....	3	20	.....	300	545	4,680
Salmon	1,551	1,212	3,796	22,266	56,771	16,282	.....	64,109	213,127	.....	1,077	279	380,470
Shad	60	554	182,220	1,800,165	1,045,410	.....	.....	8,378	2,955	.....	1,233	288	3,041,243
Smelt	.....	.....	681	596	618	742	58	.....	.....	.....	.....	.....	2,695
Sole	.....	.....	120	77	.....	.....	.....	.....	.....	.....	.....	.....	197
Splittail	.....	23	.....	.....	.....	.....	.....	.....	58	296	193	919	1,489
Striped Bass	18,330	29,838	62,357	55,707	30,043	.....	.....	106,798	25,012	.....	24,322	14,342	366,749
Suckers	.....	.....	.....	11	.....	.....	.....	.....	.....	.....	.....	5	16
Whitebait	.....	.....	.....	.....	.....	.....	.....	.....	15	.....	.....	.....	15
Miscellaneous	.....	13	312	18	73	.....	.....	48	.....	.....	.....	13	477
Clams—Softshell	3,300	2,470	3,475	4,240	3,120	2,750	5,630	2,725	5,120	4,550	3,550	3,450	44,380
Totals	24,012	38,754	264,074	1,898,900	1,147,503	20,043	5,688	198,168	266,162	29,484	52,286	28,889	3,973,963

ALAMEDA AND CONTRA COSTA COUNTIES
1927

SAN FRANCISCO AND SAN MATEO COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Anchovies								1,500	1,900				3,400
Carp		59	243	2,602	182								3,086
Cultus Cod	25,266	16,763	61,510	64,888	29,778	22,570	22,722	23,141	78,720	64,946	38,812		449,116
Eels			5	5		10							20
Flounders	46,862	29,535	29,306	8,462	19,940	3,037	625	65,386	66,136	41,290	15,650	68,440	385,639
Grayfish	55,719	52,137	23,545	9,740	1,290	800	950	2,740	4,935	8,775	31,880	30,485	224,966
Hake	450	4,680	4,962	7,282	1,462	8,700	9,250	685	600	1,742	1,935	750	42,498
Halibut	448	33	1,017	2,227	1,392	546	573	1,013	80,469	2,589	1,948	235	92,490
Herring	132,990	178,820	48,680								127	60,927	421,544
Kingfish				1,075	250	819	9,071	7,719	6,383	5,225	9,865	1,190	41,597
Mackerel						733		130	36				899
Perch	2,191	3,626	8,049	5,135	418		5,390	7,673	8,318	5,697	4,578	4,368	55,443
Rockfish	39,916	22,976	117,127	135,874	97,839	85,940	65,904	66,718	100,167	48,143	67,679	38,515	886,798
Sablefish	678	2,905	37,843	2,077	4,948	7,841	150	450		25,960	5,883		88,735
Salmon		197	4,293	4,668	19,965	7,523	19,026	611,361	269,297				936,330
Sandabs	142,297	114,449	101,537	81,250	34,412	62,708	56,675	32,350	65,414	86,856	70,916	57,340	906,204
Sardines	494,383	28,597		88,080	170,495	155,660	161,270	119,060	1,457,405	1,509,535	1,875,500	846,630	7,656,615
Sea Bass—White							66	16,383	18,240	28,815	1,082	11	64,597
Shad		12	50	9,399	7,342			25					16,828
Skates	25,811	27,137	10,055	17,675	2,850	5,462	4,875	7,138	8,275	10,445	19,710	16,905	156,338
Smelt	1,345	6,243	16,168	4,654	10,924	8,288	8,817	11,508	6,235	3,832	540	36	78,590
Sole	594,654	600,098	766,078	411,311	277,310	455,813	185,949	288,830	494,895	506,081	429,459	1,067,375	6,078,453
Striped Bass	122	4,201	27,838	27,092	9,435			26,963	10,029		417	38	106,135
Suckers			43	1,173	53								1,269
Tomcod	800	375	2,100	500		125	50						3,950
Whitebait					196	2,646	1,924	2,032	791		47	53	7,689
Miscellaneous		1,500	2	5,859	569	235	550	1,056	683	300	125	1,065	11,944
Crabs	421,800	386,040	409,656	227,502	333,336	202,152	228,000				283,464	542,256	3,034,206
Shrimps	25,047	24,681	40,229	56,231	46,867	44,293	47,285	31,892	21,230	22,027	30,872	34,741	425,392
Clams—Softshell	3,388	4,782	4,258	3,642	4,049	3,563	3,435	3,401	3,440	3,060	3,170	3,150	43,338
Cuttlefish	390	50	1,227	1,871	1,594	2,328	329	454	373		36		8,552
Mussels	361	769	1,267	615	971	1,559	885	1,336	1,038	620	880	1,006	11,307
Oysters—Eastern	53,570	48,015	48,510	42,350	26,565	18,480	17,880	25,300	50,710	65,835	79,255	108,020	584,490
Totals	2,068,488	1,559,280	1,758,598	1,223,139	1,104,432	1,101,828	851,651	1,356,244	2,755,589	2,591,743	2,973,830	2,883,536	22,228,358

SAN FRANCISCO AND SAN MATEO COUNTIES
1926

SAN FRANCISCO AND SAN MATEO COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Anchovies					50,150	59,170	56,870	55,350	40,860	15,725			278,125
Carp			375	558	1,544								2,477
Cultus Cod	13,679	13,489	49,721	47,122	10,148	10,342	11,000	45,447	44,235	18,110	26,483	40,810	330,586
Eels											5		5
Flounders	16,125	19,560	120,412	40,596	31,025	7,818	1,072	1,190	53,263	79,485	26,550	26,319	423,415
Grayfish	23,320	48,730	28,962	5,785	250	1,245	875	3,695	3,935	11,735	19,365	40,225	188,092
Hake	2,485	127	917	3,485	24,835	12,780	13,775	9,710	4,410	2,395	565	467	75,951
Halibut	268	1,173	1,133	1,387	2,214	670	1,541	551	1,856	761	1,124	384	12,764
Herring	245,330	289,975	188,205	33,570								87,520	844,600
Kingfish	250	1,325	997	3,612	2,097	5,959	16,879	7,552	1,625	7,025	125	75	47,521
Mackerel											138		138
Perch	3,670	2,624	6,980	5,327	347		1,970	9,526	10,212	3,547	1,876	1,251	47,330
Rockfish	98,725	45,847	120,827	122,164	33,257	65,613	70,313	64,398	50,398	20,187	84,753	138,592	915,074
Sablefish	6,001	10,900	64,092	42,423	13,639	26,697	53,216	29,550	92,303	21,256	11,619	32,401	404,097
Salmon	271	34	267	539	2,223	142,586	1,030,945	309,723	2,158				1,488,746
Sandabs	30,793	43,953	57,261	72,620	90,160	90,950	43,785	63,085	42,410	88,965	65,900	86,308	746,190
Sardines	634,815	115,150		9,000	4,000	126,969	118,020	2,509,930	3,733,540	3,102,285	4,122,703	4,265,330	18,741,742
Sea Bass—White								342	4,273	3,789			8,404
Shad			2,132	85,940	33,706								121,778
Skates	12,585	35,020	48,661	25,575	19,105	6,020	2,495	4,850	14,840	16,440	16,460	20,242	222,903
Smelt	62	608	30,548	22,675	12,505	11,619	2,450	2,568	5,698	1,810	529		91,102
Sole	979,466	437,245	684,825	840,555	782,192	953,774	552,166	509,014	790,123	656,464	870,263	1,112,571	9,168,958
Striped Bass		287	12,752	14,049	4,696			417	442			163	32,806
Tomcod			250					315			125		690
Turbot												75	75
Whitefish				2,034	6,562	14,419	442	1,633	2,038	1,825	1,557	445	30,955
Miscellaneous	1,325	1,690	2,775	2,633	4,996	713	1,598	3,589	3,440	1,075	750	275	24,859
Crabs	423,840	368,496	234,552	305,880	272,016	303,936	3,672				267,288	357,888	2,537,568
Shrimps	51,771	17,609	35,023	41,537	64,891	39,709	59,969	66,338	53,395	25,078	27,207	33,443	515,491
Clams—Softshell	4,304	4,264	4,062	3,965	3,853	3,129	4,070	3,620	3,619				34,886
Cuttlefish	382		789	713	489	240		475	148	54	20	79	3,389
Mussels	610	1,218	1,060	462	490	265						55	4,160
Oysters—Eastern	63,525	63,305	57,750	49,610	26,125	24,750	1,870	14,135	15,576	47,905	52,800	71,720	489,071
Totals	2,613,602	1,522,060	1,755,360	1,784,216	1,497,515	1,909,973	2,048,993	3,717,033	4,974,467	4,125,916	5,598,205	6,286,638	37,833,978

SAN FRANCISCO AND SAN MATEO COUNTIES
1927

SANTA CRUZ COUNTY

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore											120		120
Barracuda						3,141	12	5,448	12,064				20,665
Bonito							46,061	8,900	1,517				56,478
Cultus Cod	2,330	935	1,285	2,776	14,516	4,373	8,171	8,318	10,852	3,780	6,624	3,247	67,357
Flounders	299	1,794	5,863	5,146	26,600	29,912	19,200	30,075	37,925	3,344	5,911	440	166,509
Grayfish				575	100		1,150	1,600	1,050	1,350	1,355	250	7,230
Hake				875	1,512	3,950	7,700	1,050	750				15,837
Halibut	6	82	35	143	253	212	690	718	1,330	49	208		3,926
Kingfish	1,875	7,020	12,269	8,512	1,647	2,750	2,760	1,220	255	1,050	775	8,219	48,332
Mackerel		128	47		478	5,071	11,241	41,753	2,581	933			62,232
Perch	750			625				1,250	4,442	150	1,525		8,742
Rockfish	81,146	69,109	90,827	126,391	87,162	108,978	26,280	55,202	80,960	86,846	94,378	100,285	1,007,564
Sablefish	304	280	4,431	507	3,317	803			2,850				12,494
Salmon					1,968	7,778	2,016	306	167				12,235
Sandabs	6,500			8,715	39,861	36,917	41,025	24,175	17,420	10,125	6,360	125	191,823
Sardines										1,500			1,500
Sea Bass—White	90		39			2,279	50,351	45,021	87,051	735			185,566
Skates	750			5,000	6,924	5,950	4,100	5,125	7,175	3,150	3,510	1,375	43,059
Smelt			34		2,379	12,277	55	28,194	32,831	14,593	556	76	90,995
Sole	29,717	1,052	2,059	106,970	454,132	347,096	463,623	361,447	185,070	59,409	78,465	1,814	2,090,854
Tomcod	375												375
Miscellaneous				61	297	1,509	596	4,672	500	40	383		8,058
Crabs	5,568	9,576	13,224	3,504	360	120					11,400	4,080	47,832
Cuttlefish	2,569		1,388	168	105	92	75			198	12	56	4,663
Totals	132,279	90,026	131,501	269,768	641,611	573,210	685,706	624,474	486,990	187,252	211,582	119,967	4,154,366

SANTA CRUZ COUNTY
1926

SANTA CRUZ COUNTY

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Anchovies					430	13			218				661
Barracuda						9							9
Bonito								2,112	617	53			2,782
Cultus Cod	2,103	321	2,441	3,187	985	1,084	10,087	5,642	3,552	1,926	4,758	1,144	37,230
Flounders			3,626	127			27,765	35,745	11,230	4,690	63	11	83,257
Grayfish							1,975	3,550	1,100				6,625
Hake							377	7,665	560				8,602
Halibut		24	119	326	268	390	402	127	42	42	564	180	2,484
Herring					1,050	530							1,580
Kingfish	664	2,895	6,526	293	10,060	7,633	11,981	10,605	2,100	170			52,927
Mackerel	30			25	276	240	887	162		98	326	10	2,054
Perch				5,012			1,130	4,194	2,450	500			13,286
Pompano				4	94	3							101
Rockfish	75,679	78,812	30,528	10,809	50,502	71,348	13,499	60,917	81,373	30,200	37,314	20,525	561,906
Sablefish	2,696	7,280	21,317	27,229	53,602	35,105	14,741	16,305	4,887	3,668	758	1,592	190,080
Salmon			1,240	58,454	23,647	33,327	90,857	6,660					216,185
Sandabs							35,203	39,311	29,550	3,810		18	107,960
Sardines				4,985	31,115		400	85	89				36,665
Sculpin							153	354		58	10		575
Sea Bass—Black			100										100
Sea Bass—White				36		1,756	2,806	13,621	19,816	1,113			39,148
Skates							3,155	7,130	3,860	500			14,645
Smelt				135	20,330	17,244	9,438	28,045	18,452	12,510	379		106,733
Sole	494	675	5,209	5,307	4,281	2,929	278,138	295,326	128,427	31,060	710	273	752,809
Whitebait					968								968
Miscellaneous				1,650	25	92	125		75	1,594	2,597	3,697	9,833
Crab	4,128	8,472	45,984	30,432	18,024	16,128	7,056				26,328	101,184	257,736
Cuttlefish	56		743	25	104	65		58					1,051
Mussels		175											175
Squid				5,390	91,456	148,785	14,700						260,301
Totals	85,850	98,654	117,833	153,396	307,397	339,681	524,934	537,514	308,396	91,992	73,807	128,634	2,768,088

SANTA CRUZ COUNTY
1927

MONTEREY COUNTY

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore									1,728	50,591	62,691	4,089	119,099
Anchovies						3,885	10,720	33,505			450		48,560
Barracuda				42	280		2,128	3,359	18,959	21,294	19	5	46,086
Bonito	11,567			198	61	14	1,208	20,970	9,244	898	335	18	44,513
Cultus Cod	11,355	2,073	5,082	4,165	5,690	3,095	2,764	4,655	4,622	7,891	10,738	19,275	80,765
Flounders		8										8	16
Grayfish		5,767	5,520	153									11,442
Halibut	119	54	302	368	179	196	5,225	2,601	348	66	26	70	9,554
Kingfish	4,955	11,263	832	3,965	60	323	12,537	2,071	125	339	4,330	6,519	47,319
Mackerel	132,244	159,911	129,529	91,892	41,774	139,191	9,044	72,435	88,581	63,258	79,759	49,770	1,057,388
Mackerel—Horse	5	8	249	443	196	125	1,679	19,369	3,779	3,253	20,332	7,079	56,517
Perch	1,093	382	355	547	10		1,884	280	30				4,581
Pompano							81						81
Rockfish	167,028	80,851	160,020	122,067	114,683	64,606	59,233	119,049	121,515	96,524	67,680	126,698	1,299,954
Sablefish	340			13	100					306		1,655	2,414
Salmon	48			222	30,832	8,031		287					39,520
Sandabs	50		88	51	268	161	7	19	15	12	520		1,191
Sardines	21,043,675	19,800,235	16,981,115	24,955	33,265	1,045	138,500	6,060,691	31,359,932	31,753,520	18,994,000	8,969,494	155,160,307
Sea Bass—White		18			3	75	712	43,219	57,266	24,065	327		125,685
Skates												50	50
Smelt	43	410	1,152	9,290	14,188	9,863	12,370	23,436	23,146	6,606	2,280	705	103,489
Sole	171	79	4,236	61,262	31,192	24,583	31,343	23,265	1,640	1,108	540	477	179,896
Striped Bass									70				70
Whitebait							273	15					288
Miscellaneous	1,451	26	14	2,047	6,972	4,742	10,547	485		501	3,282	226	30,293
Crabs		1,104	1,698	432		96	129					312	3,672
Abalones	70,300		33,125	210,350	151,850	286,225	330,550	349,900	232,300	100,900	119,123	158,400	2,043,023
Cuttlefish	6,055	3,185	6,446	5,613	5,535	5,100	5,074	3,609	3,014	2,423	2,110	739	49,803
Mussels				625	625		750			320	160		2,480
Squid	5,548	4,185	30,845	120,378	2,255,473	617,120	4,598		1,280	150	43,251	44,331	3,127,159
Totals	21,456,027	20,069,529	17,360,518	659,180	2,693,236	1,168,476	642,247	6,782,600	31,927,594	32,134,025	19,411,953	9,389,830	163,695,215

MONTEREY COUNTY
1926

MONTEREY COUNTY

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore										1,051			1,051
Anchovies			11,012	17,096	16,131	5,480	150	2,240			3,830		55,939
Barracuda			19	6					2,594	16			2,635
Bonito		1,850	56									40	1,946
Cultus Cod	25,040	5,556	4,610	4,873	4,376	2,934	1,648	4,915	2,014	1,708	24,097	40,976	122,747
Flounders	156		5	10			150	85	665	220	255		1,546
Grayfish											2,075	1,700	3,775
Halibut	80	96	551	266	192	331	587	1,712	2,484	509	614	671	8,093
Herring			1,400										1,400
Kingfish	7,739	8,080	45,334	4,856	4,236	740	343	81		1,150	4,920	3,215	80,694
Mackerel	106,244	90,289	35,764	23,514	11,524	81,217	96,282	161,248	74,673	132,960	124,588	101,758	1,038,191
Mackerel—Horse	686	408	5,420	2,195	1,339	731	50	801	6,789	37,569		100	56,088
Perch	45	140	1,965	14,138			7,241	1,442		115	1,719	90	26,895
Pompano			64	8	4								76
Rockfish	137,048	95,970	189,714	88,063	60,866	49,937	21,557	69,781	76,811	92,976	172,896	181,173	1,236,792
Sablefish	122	2,057		60		$0	260	655	343		32		3,839
Salmon			4	137,752	180,318	145,063	29,653	8,052					500,842
Sandabs	37	20	163		72	108	83	276	351	201	1,729	499	3,539
Sardines	31,052,440	18,053,505	5,934,945	465,935	934,611	2,785,550	18,282,548	21,742,859	45,828,040	13,259,389	1,900,785	13,679,315	173,919,922
Scalpin				90	27					60			177
Sea Bass—White			241	1,318	55		129	2,772	3,365	210	273		8,363
Skates		252	771	1,022	231	149			2,503	50	1,429		6,407
Smelt	989	93	5,505	2,913	1,403	3,411	8,516	38,916	8,520	1,067	582	1,116	73,031
Sole	657	298	1,417	1,640	996	1,591	2,877	38,124	28,975	16,204	11,851	12,872	117,502
Whitebait			151	632	72			79					934
Miscellaneous	180	29	294	376	357		113	1,679	65	1,952	739	1,552	7,336
Crabs	432	432	384									336	1,584
Abalones	64,914		235,875	467,250	198,250	212,350	313,100	387,900	126,425	59,696	348,930	297,875	2,712,445
Cuttlefish	2,696	796	2,307	2,620	4,471	6,259	6,575	5,299	96	122	73	99	31,383
Mussels	1,625		9,240	5,500	4,990	3,440	360						25,155
Squid	1,705	24	16,789	154,434	3,832,920	1,304,540	37,660		223	21,561	67,485	287,840	5,725,181
Totals	31,402,835	18,259,895	6,502,000	1,396,567	5,257,441	4,603,941	18,809,882	22,469,186	46,164,936	13,628,696	2,668,872	14,611,227	185,775,478

MONTEREY COUNTY
1927

SAN LUIS OBISPO, SANTA BARBARA AND VENTURA COUNTIES

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Barracuda	5,779				8,626	8,034	4,721	31,469	1,697	1,868	2,886	5	65,085
Bonito	1,246				240	225	3,554	9,334	896				15,495
Carp							4,200						4,200
Cultus Cod	12							130		6	215		363
Halibut	17,077	8,863	19,353	7,625	23,105	27,311	16,466	36,255	11,990	22,411	19,775	18,032	228,263
Herring	239	51											290
Mackerel	2,783				3,769	2,876	298	6,538	478	40			16,782
Perch			506							145	73		724
Rock Bass				83	684	598	56	541		18		42	2,022
Rockfish	6,055	3,824	7,731	3,661	2,817	2,925	3,466	12,597	14,806	10,378	10,013	8,995	87,248
Sablefish	12							8		95		34	149
Sculpin							7						7
Sea Bass—Black				448			195	530		286	592		2,051
Sea Bass—White	543			1,654	2,287	6,966	25,901	24,399	3,668	21,120	17,960	530	105,028
Sheepshead	40	40	121			650					480	259	1,560
Smelt	3,331	5,868	7,748	6,849	8,387	3,644	1,100	507	135			1,747	39,316
Sole	5,410	9,656	7,315	8,550	10,391	8,255	7,025	6,890	3,325	4,952	8,773	6,670	87,212
Whitefish							560	3,100	1,060				4,720
Yellowtail						228	9	2,330	401	272	245		3,485
Miscellaneous	2,935	1,469	205		46	8	2,121	2,730	202	101	1,296	839	11,952
Spiny Lobsters	4,546	4,486								14,120	21,013	15,424	59,589
Abalones	824		1,517	1,470	1,605	2,763	3,005	328	189	185	5,054	2,807	17,747
Clams—Piamo	25,199	15,054	16,273	23,733	28,097	29,255	28,775	27,767	25,319	21,889	17,489	15,447	274,317
Mussels				25			632						657
Totals	76,011	49,311	60,769	53,670	90,502	93,738	102,091	165,453	64,166	97,886	103,864	70,831	1,028,292

SAN LUIS OBISPO, SANTA BARBARA AND VENTURA COUNTIES
1926

SAN LUIS OBISPO, SANTA BARBARA AND VENTURA COUNTIES

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Barracuda			7	578	285	876	4,165	4,170	5,363	3,001	11		18,456
Bonito						2	201	95	13	458			769
Cultus Cod			16				38	35	98		126	149	462
Halibut	15,167	13,375	21,823	17,190	13,838	24,672	38,104	36,433	21,533	13,194	16,851	30,138	262,418
Herring	282	239	21										542
Mackerel	150	645	159			78	1,573	2,457	1,942	926	3,665	38	11,613
Perch			454	286			110		296	17	26	168	1,337
Rock Bass	9		399	22	330	639	567	1,262	372	956	875	839	6,270
Rockfish	12,078	7,107	14,338	16,117	7,729	11,677	9,031	16,440	4,499	4,816	9,932	7,858	121,622
Sablefish		5		18				40				67	130
Salmon							21						21
Sardines					180		225	155	312	7	20		879
Sculpin		6					10	18	7		18		59
Sea Bass—Black	104					350	165	445	255	1,112	1,035	512	3,978
Sea Bass—White	2,697	165	62		1,174	7,660	10,477	9,199	2,199	7,273	6,384	1,641	48,331
Sheepshead	56	98	65					110		18	36	333	716
Smelt	2,745	9,092	11,429	11,095	2,826	2,755	3,383	4,332	4,332	3,094	74	629	56,685
Sole	5,558	6,181	14,820	16,037	14,544	44,028	30,816	45,725	9,870	3,348	8,090	8,039	207,056
Whitefish		13							75				88
Yellowtail								20			19		39
Miscellaneous			2,962	5,183	1,262	202	3	280			189	34	10,115
Spiny Lobsters	13,361	11,469								18,675	28,206	32,232	103,943
Ablones	998		5,381	2,091	1,433	574	3,146	942		316	3,156	48	18,085
Clams—Pismo	13,956	11,019	19,996	18,768	20,727	22,343	20,171				1,535	4,485	133,999
Cuttlefish						61	41	55					157
Mussels	23		68		20								111
Totals	67,184	59,414	91,944	88,301	64,348	115,917	122,246	122,193	51,166	57,211	80,348	87,210	1,007,482

SAN LUIS OBISPO, SANTA BARBARA AND VENTURA COUNTIES
1927

LOS ANGELES COUNTY, INCLUDING LANDINGS FROM MEXICO

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore	9,935			29		230,672	808,187	673,766	39,252	152	2,096	1,944	1,766,033
Anchovies					790	1,768	2,099	505	410	1,225	535	934	8,197
Barracuda	81,005	141,528	272,529	586,694	462,136	334,894	236,280	174,198	120,640	179,783	182,999	151,783	2,924,478
Bonito	5,373	7,227	5,216	8,441	25,407	161,728	107,295	1,625,151	367,917	286,276	22,252	23,233	2,645,499
Carp											5,173	3,484	8,657
Cultus Cod	180	102	185								35		502
Eels					155								155
Flounders	200		32	6	139	1,323	332	498	72	83	67	60	2,812
Grayfish	2,342	4,105	3,926	5,154	3,508	4,335	3,453	5,242	2,973	2,152	1,586	4,069	42,845
Halibut	48,487	92,989	149,803	34,406	29,826	12,975	11,892	30,009	27,118	22,162	17,239	12,675	489,581
Kingfish	45,950	48,221	40,022	24,554	14,390	17,131	1,667	5,777	25,099	36,269	37,522	45,399	342,001
Mackerel	161,647	93,085	153,208	173,001	146,918	151,640	57,463	73,262	148,069	329,567	175,057	156,866	1,849,853
Mackerel—Horse	994	3,580	1,568			8,023	23,808	31,974	14,049	39,890	28,057	30,313	182,256
Mullet	3,443												3,443
Perch	5,292	5,329	4,706	5,697	1,628	1,558	953	2,089	8,207	9,426	8,108	4,755	57,748
Pompano	918	630	3,149	878	704	416	14	4	20	339	486	204	7,762
Rock Bass	7,513	3,346	24,479	29,253	38,086	30,834	63,172	43,948	23,797	18,339	31,143	8,016	321,926
Rockfish	300,419	312,345	392,311	267,680	244,304	111,030	98,675	97,488	147,458	194,234	291,378	359,986	2,817,308
Sablefish	318	35	2,108	1,119	31	5	34		172	10	69	398	4,299
Sandabs	1,224	435	1,615	1,593	1,508	1,408	740	430	402	938	850	1,556	12,694
Sardines	25,562,289	38,193,330	21,766,962	512,149	11,127	2,668	9,285	5,405	329,825	2,670,890	15,585,817	8,844,427	113,494,174
Sculpin	4,466	1,217	8,284	10,139	9,090	5,689	308	11,958	14,692	10,540	9,891	8,465	94,739
Sea Bass—Black	1,906	2,002	3,411	3,883	1,927	752	2,768	3,690	2,046	1,176	4,606	4,022	32,189
Sea Bass—White	41,421	56,573	33,625	20,705	103,250	34,307	285,161	269,060	43,650	10,745	79,801	101,199	1,079,497
Sheepshead	6,128	6,416	8,127	6,758	5,447	1,959	478	7,716	12,759	13,447	22,884	13,241	105,460
Skates	2,797	5,104	5,432	2,556	995	1,424	642	439	298	18	426	635	20,676
Skipjack	86		1,035	68,588	736,592	393,208	399,613	5,304,654	3,384,790	2,347,799	524,167	250,562	13,611,184
Smelt	37,304	26,862	35,326	21,224	13,146	17,819	19,093	20,372	20,142	37,705	33,060	47,595	327,848
Sole	1,771	1,010	3,158	521	390	15	508	292	3,074	1,210	254	316	12,579
Swordfish				495		602	1,605	1,712	4,054	1,395	935		10,798
Tuna, Unclassified	800	4,669	8,246		115,366	115,846	15,928						260,855
Tuna—Bluefin			1,078	15,164	53,505	2,116,665	2,870,380	1,175,836	104				6,232,762
Tuna—Yellowfin	4,563		87,712	903,359	1,345,756	625,174	7,638	838,528	1,005,326	734,789	961,499	209,833	6,814,174
Whitefish	39,234	18,059	55,519	35,718	14,477	2,251	1,701	17,887	22,943	26,365	27,999	25,361	287,514
Yellowtail	23,274	44,163	75,068	153,662	241,915	186,742	61,488	402,041	165,097	109,353	64,785	67,738	1,595,236
Miscellaneous	6,019	13,950	23,656	12,895	12,352	6,726	6,463	9,922	14,547	9,429	12,149	13,586	141,096
Spiny Lobsters	48,858	5,973								46,332	66,493	29,185	196,841
Clams—Cockle	1,272								150				1,422
Clams—Mixed	3,514												3,514
Cuttlefish	34		85		61						25	41	246
Mussels									75				75
Oysters—Native	360												360
Totals	26,461,336	39,089,285	23,169,271	2,908,301	3,634,926	4,581,707	5,139,236	10,833,853	6,039,056	7,332,945	18,199,403	10,421,951	157,811,270

LOS ANGELES COUNTY, INCLUDING LANDINGS FROM MEXICO
1926

LOS ANGELES COUNTY, INCLUDING LANDINGS FROM MEXICO

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore						217,688	1,200,632	1,527,973	483,114	271,702	12,329	5,150	3,718,588
Anchovies	6,360		7,777	2,910	7,131	5,960		635	15	355	349	643	32,126
Barracuda	193,299	230,062	248,344	329,067	1,028,831	640,105	367,372	627,884	289,962	405,362	284,734	314,568	4,959,590
Bonito	12,718	3,160	1,624	11,153	1,972	26,536	92,071	121,912	269,813	507,901	174,546	63,557	1,286,980
Carp			2,601										2,601
Cultus Cod		296	479	57									832
Flounders	144	3	145	92	236	475	158	681	295	10			2,239
Grayfish	2,189	1,683	1,766	5,598	7,289	18,298	7,865	8,515	5,738	8,323	16,247	7,361	90,872
Halibut	27,279	66,424	161,528	51,610	34,746	14,930	3,060	12,871	28,276	21,735	21,273	12,849	456,581
Kingfish	51,106	51,669	50,548	23,995	32,617	26,867	4,150	11,649	9,953	29,409	31,898	27,459	342,320
Mackerel	205,857	212,309	245,894	114,179	224,734	199,428	163,229	145,737	181,111	318,029	252,531	665,967	2,929,005
Mackerel—Horse	29,570	31,219	46,581	17,240	25,187	18,985	50,856	28,764	31,064	42,353	29,695	58,874	411,288
Mullet		2,193	2,697		700	887	4,030	885	103		1,063	2,421	14,979
Perch	3,686	7,741	16,650	7,837	74	1,195	7,837	9,673	2,694	4,649	7,398	8,780	78,174
Pompano	4,533	7,822	9,461	496	13,340	656	172	79	32	88	492	134	37,005
Rock Bass	5,763	10,321	5,393	12,453	24,541	54,767	56,277	25,929	9,903	15,661	12,059	14,152	247,219
Rockfish	306,997	233,047	579,264	252,864	159,407	165,107	29,298	29,746	43,311	173,526	119,008	82,242	2,173,917
Sablefish	178	232	1,279	105	70								1,864
Sandabs	1,429	800	1,429	1,472	1,536	1,412	1,033	1,048	1,032	873	870	864	13,798
Sardines	26,051,313	22,952,252	40,923,435	2,317,615	9,767,543	864,253	7,552	14,383	530,296	2,995,617	20,000,132	17,142,640	143,547,031
Sculpin	9,563	7,765	8,626	5,829	11,012	4,962	2,184	2,775	8,825	3,402	5,098	4,346	74,387
Sea Bass—Black	2,667	2,584	2,069	742	283	1,769	2,455	3,513	413	5,868	6,057	11,137	39,587
Sea Bass—White	236,541	277,357	247,488	20,001	102,997	184,411	67,391	92,867	50,546	32,919	9,623	29,214	1,345,394
Sheepshead	15,879	14,043	11,424	10,976	5,539	2,218	526	2,696	3,922	5,602	8,744	29,625	111,194
Skates	1,137	1,625	2,063	844	1,063	431	381	863	1,706	1,225	5,451	2,577	19,366
Skipjack	4,224		4,969	220,375	100,557	190,852	60	3,492,844	9,099,396	3,781,428	1,021,545	194,244	18,110,494
Smelt	36,682	29,387	42,645	33,358	16,532	42,564	26,499	30,336	29,813	45,298	63,443	41,557	438,114
Sole	564	3,453	2,513	325	284	859		1,746	5,047	1,056	3,440	3,814	22,931
Swordfish				595		1,752	2,054	1,043	2,754	1,402	606		10,206
Tuna—Bluefin						705,605	1,118,307	656,138	1,043,679	224,118	29,060	523,518	4,361,453
Tuna—Yellowfin	7,175	243	145,381	1,811,219	2,432,144	323,548	1,146	297,212	3,437,865	2,500,199	1,614,433	362,527	15,333,090
Whitefish	42,889	30,696	27,650	13,728	6,459	17,514	4,084	516	2,026	12,528	24,436	29,641	212,167
Yellowtail	661	1,013	71,719	195,214	59,392	10,774	14,242	108,196	73,966	579,895	453,609	93,251	1,641,932
Miscellaneous	13,804	8,499	13,937	4,525	8,901	11,701	9,930	14,175	9,210	6,199	16,129	13,839	130,449
Spiny Lobsters	20,685	19,123	2,178							52,829	77,938	43,055	215,808
Clams—Mixed	2,517	3,070			330	54							5,971
Cuttlefish	64	27									28	57	176
Squid	400	25,091	2,690	148									28,329
Totals	27,297,671	24,214,889	42,892,377	5,466,524	14,075,047	3,817,561	3,244,881	7,273,284	15,656,095	12,440,561	24,284,284	19,784,163	200,447,937

LOS ANGELES COUNTY, INCLUDING LANDINGS FROM MEXICO
1927

ORANGE COUNTY

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore						1,410	261	295					1,966
Barracuda			201	5,119	23,990	12,179	2,612	649		6			44,756
Bonito	10		499	335	748	1,546	984	587	71	10			4,790
Cultus Cod	311	72											383
Grayfish								12					12
Halibut	9,672	17,533	8,386	1,246	2,904	1,546	48	525	107	188		876	43,031
Kingfish	25	512			39							18	594
Mackerel	9,261	30,021	22,263	20,273	8,605	7,950	950	1,960	25,703	5,636	9,354	8,841	150,817
Mackerel—Horse	386		5										391
Mullet	48							36	459	481			1,024
Perch	110				27			80	10	36		6	269
Rock Bass	5,606	1,092	5,587	2,289	270	2,599	806	6,477	9,247	10,030	8,884	5,606	58,493
Rockfish	7,874	2,148	3,665	4,233	3,664	2,388		889	1,449	1,747	2,836	490	31,683
Sablefish										20			20
Sandabs	57	5	85						76	5			228
Sardines	635	75						400	128				1,238
Sculpin	4	48	352					35		63	25		527
Sea Bass—Black	69	74		262		897		240	1,156	1,952	1,916	8	6,374
Sea Bass—White	1,234	156	313	822	1,561	67		294	867	92	428	34	5,868
Sheepshead			20							597	1,603	396	2,616
Skates	15												15
Skipjack	360			241				117					718
Smelt	14,556	55	190	200	621		808	65	42,777	52,568	30,780	20,587	163,207
Sole	496	285	186	902	134	385				81		375	2,754
Swordfish								165					165
Tuna—Yellowfin								2,533	392	27	31		2,982
Whitefish			227									62	289
Yellowtail			484	1,558	587	284	139	81	254	220	42		3,649
Miscellaneous	1,262	582	304	209	318	552		202	36	1,086		115	4,666
Spiny Lobsters	3,392	682								7,451	6,697	2,921	21,143
Totals	55,293	53,340	42,767	37,689	43,768	31,803	6,608	15,641	82,732	82,296	62,596	40,335	554,868

ORANGE COUNTY
1926

ORANGE COUNTY

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore						414	1,296	5,875	1,678	12,937	1,908	257	24,365
Barracuda				7,308	90,744	8,867	1,910	120		674			109,623
Bonito	13	5	275	1,900	60	145	450	24	393	947			4,212
Flounders		7		49		19	15	5					95
Halibut	3,423	3,282	6,261	6,353	5,532	1,641	17	8	26	51	51	341	26,986
Kingfish		45	107	397	27	8							584
Mackerel	32,429	17,472	33,110	29,592	26,416	8,234	1,708	3,829	2,048	4,291	7,907	24,116	191,152
Mullet									413	52	45		510
Perch	6	10					637	186		7			846
Rock Bass	748	6,256	6,257	8,303	5,527	6,527	6,723	3,688	10,440	6,466	13,356	13,327	87,612
Rockfish	610	638		116	3,885	743	697	1,940	952	39,849	44,358	7,549	101,237
Sandabs			5	100						28			133
Sardines		50									900	65	1,015
Sculpin	98	161	159	148		9	125	5			36	217	958
Sea Bass—Black	803	2,150	5,379	3,022	7,419	2,964	2,163	527	823	2,334	5,720	2,637	35,941
Sea Bass—White	7,663	143	95	2,368	331	336	954	155	122	530	508	183	13,387
Sheepshead	321	18		10	32		10		48	79	178	147	843
Skates	4												4
Skipjack								48	1,881	56	124		2,109
Smelt	18,336								32,552	29,313	17,068	12,482	109,751
Sole	469	31	486	198	319	51	8						1,562
Tuna—Bluefin									765			17	782
Tuna—Yellowfin								45		21	114		180
Whitefish												21	21
Yellowtail		23		11		30	15	14	382	715	75	68	1,333
Miscellaneous	829	207	408	79	94	58			204	237	2	473	2,591
Spiny Lobsters	2,897	694								6,716	12,665	3,698	26,670
Cuttlefish											4	14	18
Totals	68,648	31,192	52,542	59,954	140,386	30,046	16,728	16,469	52,727	105,303	104,913	65,612	744,520

ORANGE COUNTY
1927

SAN DIEGO AND IMPERIAL COUNTIES (INCLUDING LANDINGS FROM MEXICO)

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore					418	164,930	401,840	15,219	155	51	90		582,703
Barracuda	17,631	50,165	111,744	240,894	114,645	590,571	349,236	188,689	108,525	91,874	32,791	24,631	1,921,394
Bonito	10,401	3,990	6,831	3,428	20,262	78,892	144,581	49,074	12,020	12,942	6,860	5,551	354,832
Dolphin											1,810	1,335	3,145
Eels	41	22											63
Flounders	42	22		12									76
Grayfish	20,432	5,795	18,820	23,331	26,806	535	29,028	16,540	45,105	17,703	6,218	9,845	220,228
Halibut	67,998	30,502	59,270	8,331	35,140	89,941	66,805	149,749	27,910	15,194	6,713	7,874	565,427
Herring	1,825										584	11,290	13,699
Kingfish	1,416	94	215	99	427	25	260		83	2,004	345	80	5,058
Mackerel	92,432	68,909	76,885	30,247	26,041	15,344	19,611	12,726	5,660	45,672	42,951	48,463	484,941
Mullet	8,142	14,297	7,781	675	1,426	3,063	1,475	467	1,096	5,113	3,366	385	47,286
Perch	115	650	162	42			514	546	718	2,778	130		5,655
Pompano		40		146	26	70							282
Rock Bass	21,709	11,552	12,441	16,239	19,010	44,338	51,666	15,579	5,367	14,268	22,368	19,377	253,914
Rockfish	241,675	136,279	218,460	143,116	139,378	75,846	67,525	64,049	58,315	48,438	81,723	70,021	1,344,824
Sardines	1,005,188	3,591,464	5,407,754	1,251	511,997	16,320	383,890	3,982	2,724	38,917	61,347	2,432	11,027,266
Sculpin	5,896	640	1,931	226	532	11	36	135	1,015	474	1,660	239	12,795
Sea Bass—Black	9,380	27,333	23,954	23,889	19,463	27,084	9,511	23,667	39,348	67,042	46,156	20,293	337,120
Sea Bass—White	15,674	25,260	31,218	30,268	49,448	28,670	147,273	97,906	62,305	43,927	63,376	10,514	605,839
Sheepshead	3,147	301	554	730	705	81	1,048	2,052	2,500	5,152	7,862	5,129	29,261
Skates	2,055	2,575	6,175										10,995
Skipjack	31,510	12,661	3,543	85,724	257,009	262,146	37,203	2,882,837	2,040,140	812,656	557,901	356,116	7,339,446
Smelt	1,801	1,782	1,026	53	1,075	436	872	4,891	165	196	32	473	12,802
Sole	1,114	331	399	37	52	25	25					609	2,592
Swordfish	500					2,682	1,120	4,340	11,284	12,961	1,693		34,580
Tuna													
Tuna—Bluefin						280,332	13,368	71					293,771
Tuna—Yellowfin	224,899	144,278	156,613	339,960	359,196	180,956	1,578	1,564,651	1,178,049	655,633	507,917	434,070	5,747,830
Whitefish	14,180	8,782	10,439	7,835	2,629	60	690	842	1,283	3,466	11,542	14,182	75,541
Yellowtail	94,789	19,272	150,232	185,913	378,060	509,294	425,447	342,876	417,773	307,879	309,216	279,993	3,420,744
Miscellaneous					150					710			860
Spiny Lobsters	109,731	79,519	114,679	17,421						76,200	242,006	258,094	897,650
Squid			8,402										8,402
Totals	2,003,723	4,236,615	6,429,307	1,159,868	1,963,905	2,371,652	2,154,512	5,440,888	4,021,538	2,281,250	2,016,687	1,580,996	35,660,941

SAN DIEGO AND IMPERIAL COUNTIES (INCLUDING LANDINGS FROM MEXICO)
1926

SAN DIEGO AND IMPERIAL COUNTIES (INCLUDING LANDINGS FROM MEXICO)

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore						33,392	421,544	377,162	2,378	751	136		835,363
Anchovies				970		380							1,350
Barracuda	59,302	42,003	41,043	159,107	175,504	196,739	202,691	92,324	47,784	41,881	26,451	24,397	1,109,426
Bonito	6,487	2,476	1,700	48	1,848	39,778	168,914	110,617	36,647	21,732	17,728	13,344	421,319
Grayfish	23,035	7,383	5,692				167						36,187
Halibut	58,043	39,876	49,716	43,606	94,104	64,313	86,791	72,011	21,665	8,182	3,300	4,114	545,721
Herring	3,026										508	12,411	15,945
Kingfish	170	240	177	145	586	1,068	633	1,909	203	90			5,221
Mackerel	103,135	35,508	28,651	104,970	70,577	53,321	42,393	12,622	11,641	26,559	40,378	38,751	568,496
Mullet	242	2,215	9,627	5,408	388	1,939	1,745	1,502	653	462	146	160	24,487
Perch			555	220			205	765	538	285			2,568
Pompano		1,535	9	15,620	73	221	56	395		36			17,945
Rock Bass	22,970	14,916	6,263	14,624	9,212	37,065	33,360	25,473	7,113	5,063	4,861	3,791	184,739
Rockfish	138,714	62,128	165,768	158,679	172,207	152,941	76,517	29,145	23,447	28,829	50,071	97,402	1,155,948
Sardines	438,499	1,525,672	178,556	395,592	1,180,570	852,086	4,807	1,941	263,324	794,170	391,610	670	6,027,797
Sculpin	3,636	1,213	5,791	5,169	2,046	337	6,409	4,974	2,943	843	1,105	3,587	38,053
Sea Bass—Black	34,999	35,732	10,408	8,958	4,578	28,507	60,511	42,927	15,435	36,312	18,089	91,533	387,989
Sea Bass—White	27,602	10,159	14,813	14,916	26,401	224,122	160,118	198,427	54,396	35,364	5,655	22,345	794,318
Sheepshead	12,409	1,453	1,163	860	75		1,137	542	2,334	4,825	13,639	8,207	46,644
Skipjack	55,319	32,572	48,444	611,362	192,894	548,824		4,088,985	5,451,999	2,918,071	875,081	869,776	15,093,357
Smelt	5,049	1,445	1,589	3,535	3,018	744	223	1,042	1,261	299	2,847	1,620	22,672
Sole	563	177	1,052	207	115	155				264	435	843	3,791
Swordfish						2,608	18,653	37,877	40,894	19,194	856		120,082
Tuna—Bluefin						217,402	318,694	83					536,151
Tuna—Yellowfin	149,644	295,968	676,929	941,009	1,624,695	588,709	587	884,064	2,252,425	1,334,239	2,019,970	1,832,536	12,600,775
Whitefish	3,786	2,823	8,120	10,205	16,831	7,352	15,804	6,907	1,584	6,760	1,187	19,467	100,826
Yellowtail	35,351	9,953	40,161	83,714	46,754	142,872	345,376	571,311	229,484	532,531	316,223	227,819	2,581,549
Miscellaneous	5,898	7,299	275	5,685		75							19,232
Spiny Lobsters	229,222	212,790	157,862	69,992						62,260	203,395	209,016	1,144,537
Squid									302				302
Totals	1,417,101	2,345,527	1,454,274	2,654,931	3,622,666	3,195,018	1,967,155	6,563,007	8,468,450	5,879,002	3,993,661	3,481,969	45,042,761

SAN DIEGO AND IMPERIAL COUNTIES (INCLUDING LANDINGS FROM MEXICO)
1927

FISH LANDED IN CALIFORNIA FROM SOUTH OF AN EXTENTION OF THE INTERNATIONAL BOUNDARY LINE BETWEEN THE UNITED STATES AND MEXICO

(This Includes Both High Seas Fish Caught off the Coast of Mexico and the Catch Made in the Territorial Waters of Mexico)

1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore											60		60
Barracuda	80,654	177,210	255,172	376,031	169,599	125,964	16,277	197,011	139,072	164,967	199,553	175,785	2,077,295
Bonito	6,284	7,277	5,966	5,589	11,495	3,916	2,292	535	11,012	76,325	22,364	25,645	178,698
Dalphin											1,810	1,335	3,145
Flounders		22											22
Halibut	26,459	16,064	3,008	190	26,911	93,481	65,128	150,922	30,306	12,921	3,733	3,214	432,337
Kingfish	125					20							145
Mackerel				550	1,627			458	286	5,110	2,710	2,451	13,192
Mackerel—Horse	50	255						1,290	1,030	1,378			4,013
Mullet	455	8,010	4,438	163						2,855	2,620		18,541
Perch	115	885	263							2,947	130		4,340
Rock Base	10,502	10,339	3,730	6,009	374	289		269	167	5,953	15,770	18,650	72,058
Rockfish	90	6,305	4,737	335		330					974	1,250	14,022
Sea Bass—Black	4,755	27,463	17,168	21,027	15,030	17,795	1,534	20,021	23,169	53,392	42,813	13,687	257,894
Sea Bass—White	55,917	79,578	47,389	31,655	59,940	26,838	113,511	52,814	29,670	17,028	117,265	106,728	738,613
Sheepshead	85	115			165			1,245			1,250		2,860
Skipjack	31,510	12,661	3,543	153,932	993,486	655,444		299,953	1,154,534	1,789,792	1,033,545	605,930	6,734,330
Smelt	210					500		100	557		290	325	1,982
Swordfish						270			1,000		305		1,575
Tuna—Unclassified					99								99
Tuna—Yellowfin	229,462	144,278	191,705	1,243,319	1,704,952	801,176		905,513	1,479,956	1,144,838	1,380,781	643,534	9,869,494
Whitefish	2,673	1,520	389	486	68			422		1,415	6,789	10,056	23,728
Yellowtail	115,750	60,479	149,549	176,729	189,243	78,906	15,825	119,888	127,847	162,748	327,398	325,518	1,849,693
Miscellaneous	597	7,580	12,398			275				710	420	497	22,477
Spiny Lobsters	102,608	73,523	114,679	17,421						35,304	175,741	213,749	733,025
Clams—Cockle	1,272												1,272
Clams—Mixed	3,514												3,514
Oysters—Native	360												360
Totals	673,457	633,575	814,014	2,033,436	3,172,989	1,805,234	214,867	1,750,451	2,968,606	3,477,683	3,338,137	2,146,322	23,058,741

FISH LANDED IN CALIFORNIA FROM SOUTH OF AN EXTENTION OF THE INTERNATIONAL BOUNDARY LINE BETWEEN THE UNITED STATES AND MEXICO

(This Includes Both High Seas Fish Caught off the Coast of Mexico and the Catch Made in the Territorial Waters of Mexico)

1926

FISH LANDED IN CALIFORNIA FROM SOUTH OF AN EXTENTION OF THE INTERNATIONAL BOUNDARY LINE BETWEEN THE UNITED STATES AND MEXICO

(This Includes Both High Seas Fish Caught off the Coast of Mexico and the Catch Made in the Territorial Waters of Mexico)

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore								123,389	580	26			123,995
Barracuda	252,449	271,924	266,979	127,037	7,773	11,644	910	13,531	41,656	246,461	266,210	337,582	1,844,156
Bonito	6,762	2,747	1,332			155			1,043	332,501	184,033	67,939	596,532
Halibut	35,568	36,213	47,545	39,269	85,633	60,840	75,151	71,515	21,596	7,931	2,767	1,014	485,042
Mackerel	2,075	8,371	200	1,090									11,736
Mackerel—Horse											2,563	2,274	4,837
Mullet	242	4,408	12,063	5,408	700						1,148	2,421	26,390
Perch		5,295	2,064	220								185	7,764
Pompano	4,050	8,938	9,428	15,878	12,108								50,402
Rock Bass	18,137	16,100		1,513	1,561				358	915	460	1,014	40,058
Rockfish		495	6,302	540							297	222	7,856
Sea Bass—Black	32,926	35,422	10,743	3,411	2,446	8,412	19,405	16,230	8,551	33,231	22,211	91,881	284,869
Sea Bass—White	259,932	268,370	257,091	23,926	5,089	238,200	126,815	170,990	46,885	31,014	7,308	30,938	1,466,848
Sheepshead	285	325											610
Skipjack	59,543	32,572	53,413	831,667	293,451	739,676		5,637,290	11,427,526	6,154,782	1,709,671	1,063,771	28,003,362
Smelt	40	280											320
Sole			22										22
Tuna—Yellowfin	156,817	296,098	822,310	2,752,228	4,056,839	912,257		1,112,719	5,580,196	3,829,907	3,632,849	2,186,578	25,338,798
Whitefish	2,756	3,127	2,989	972	1,367					630	4,046	9,621	25,508
Yellowtail	34,914	10,175	109,136	166,719	42,716	12,035	90,108	273,039	51,451	962,107	732,026	304,911	2,783,397
Miscellaneous	6,890	9,544	4,978	5,750	350	75					6,789	1,190	35,566
Spiny Lobsters	269,526	203,485	157,862	69,992						30,525	167,209	144,236	982,835
Clams—Mixed	2,517	3,070											5,587
Totals	1,085,429	1,217,159	1,764,457	4,045,620	4,510,033	1,983,354	312,389	7,418,703	17,179,842	11,630,039	6,739,677	4,245,797	62,132,490

FISH LANDED IN CALIFORNIA FROM SOUTH OF AN EXTENTION OF THE INTERNATIONAL BOUNDARY LINE BETWEEN THE UNITED STATES AND MEXICO

(This Includes Both High Seas Fish Caught off the Coast of Mexico and the Catch Made in the Territorial Waters of Mexico)

1927

15. TABLES SHOWING THE MONTHLY CATCHES LANDED IN CALIFORNIA FOR THE TWO YEARS 1926 AND 1927

In the preceding tables, the catches for each district of the state were shown. These district figures were summed and the results are here presented to show the monthly landings for the state as a whole. As in the preceding tables, these figures are in pounds and include fish landed in California from the territorial waters and high seas off the coast of Mexico.

TABLES SHOWING THE MONTHLY CATCHES LANDED IN CALIFORNIA FOR THE TWO YEARS 1926 AND 1927

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1926

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore	9,935			29	418	397,012	1,210,288	689,280	41,135	50,794	64,997	6,033	2,469,921
Anchovies					790	5,653	12,780	35,510	2,310	1,225	985	904	60,157
Barracuda	104,415	191,693	384,474	832,749	609,677	948,819	594,989	403,812	261,892	294,825	218,695	176,424	5,022,464
Bonito	28,597	11,217	12,546	12,402	46,718	242,405	303,683	1,714,016	391,665	300,126	29,427	28,802	3,121,604
Carp	14,993	12,184	15,540	7,310	742	408	4,200	665	90	16	7,635	8,395	72,178
Catfish	21,196	45,840	34,622	24,834	9,935			11,946	21,015	33,668	28,637	25,684	257,377
Cultus Cod	39,434	20,088	68,807	75,103	55,188	34,466	42,732	51,014	97,038	77,645	65,448	22,939	649,902
Dolphin											1,810	1,335	3,145
Eels	41	22	5	5	155	10							238
Flounders	51,632	43,129	30,558	19,033	46,679	34,328	20,457	95,959	104,226	93,277	34,314	94,049	667,711
Grayfish	78,403	67,804	53,881	38,755	31,704	5,670	34,581	26,134	54,033	29,980	41,039	44,649	506,723
Hake	450	4,680	4,962	8,157	2,974	12,650	16,950	1,735	1,350	1,742	1,935	750	58,335
Halibut	143,807	150,056	238,166	54,391	146,319	182,124	153,453	254,072	186,735	78,452	60,383	39,762	1,687,720
Hardhead	15,847	4,429	2,102							4,095	4,976	12,176	43,625
Herring	157,619	179,681	54,140								831	81,336	453,907
Kingfish	54,221	67,110	53,338	38,205	16,823	21,048	26,295	16,787	31,945	44,887	52,837	61,425	484,921
Mackerel	398,357	349,104	382,350	317,413	227,585	322,805	138,607	208,804	271,108	436,106	397,101	263,940	3,623,290
Mackerel—Horse	1,385	3,388	1,822	443	196	8,148	25,487	51,343	17,828	43,143	48,389	37,302	239,164
Mullet	11,633	14,297	7,781	675	1,426	3,063	1,475	503	1,555	5,594	3,396	385	51,753
Perch	21,234	17,315	29,587	20,205	7,373	7,284	11,950	21,255	23,899	22,325	16,329	10,154	208,910
Pike	708	491	227	116		8		16	46	205	529	644	2,990
Pompano	918	670	3,149	1,024	730	486	95	4	20	339	486	204	8,125
Rock Bass	34,828	15,990	42,507	47,844	58,339	78,080	115,700	66,545	38,411	42,655	62,395	33,041	636,335
Rockfish	849,743	628,016	904,892	810,537	693,269	457,718	328,976	425,446	536,183	493,832	619,367	704,990	7,540,969
Sablefish	1,652	3,220	44,382	3,716	15,374	12,959	1,426	18,854	30,062	19,158	22,752	2,087	175,642
Salmon	779	3,811	47,131	231,277	817,358	780,987	208,711	2,208,050	1,239,565	43,221	95,577	27,612	6,084,079
Sandabs	153,968	118,659	108,655	98,239	76,569	101,194	99,047	56,974	83,327	105,606	81,896	59,801	1,143,935
Sardines	48,106,170	61,613,671	44,155,831	626,435	726,884	175,693	693,095	6,189,538	33,150,014	36,124,362	36,516,664	18,662,893	286,741,250
Scalpin	10,266	1,905	10,597	10,365	9,622	5,700	351	12,128	15,707	11,077	11,576	8,704	108,068
Sea Bass—Black	11,355	29,409	27,365	28,034	21,838	28,733	12,474	28,127	42,550	70,456	53,270	24,323	377,934
Sea Bass—White	58,962	82,007	65,193	53,449	156,549	72,304	519,760	510,412	291,974	130,357	163,085	112,288	2,216,402
Shad	29	1,722	229,356	631,613	28,195			1,811	23		8,588	895	902,202
Sheepshead	9,315	6,757	8,822	7,488	6,152	2,690	1,526	9,768	15,259	19,196	32,829	19,125	138,927
Skates	31,428	34,916	21,662	23,231	10,769	12,836	9,617	12,702	15,658	14,913	23,646	19,615	232,993

1926

Skipjack	31,956	12,661	4,578	154,553	993,601	655,444	436,816	8,187,608	5,424,930	3,360,455	1,082,068	606,678	20,951,348
Smelt	61,590	48,855	68,424	45,459	54,449	66,431	46,204	92,388	130,722	121,240	75,199	72,162	883,123
Sole	656,123	628,711	811,621	651,673	779,404	836,409	689,830	680,867	688,004	600,121	528,541	1,098,566	8,649,870
Splittail	483	2,161	320					410	155		661	1,132	5,322
Striped Bass	61,582	110,145	169,592	138,075	17,130			89,931	26,686		63,863	73,797	750,801
Suckers	478	230	43	1,173	53						7	4	1,988
Swordfish	500			495		3,284	2,815	6,217	15,338	14,266	2,628		45,543
Tomcod	1,175	375	2,100	500		125	50						4,325
Tuna	800	4,669	8,246		115,366	115,846	15,928						260,855
Tuna—Bluefin			1,078	15,164	53,505	2,397,027	2,883,748	1,175,907	104			643,903	6,526,533
Tuna—Yellowfin	229,462	144,278	244,225	1,243,319	1,704,952	806,130	9,216	2,405,711	2,273,767	1,390,446	1,469,477	32	12,564,986
Turbot		34	125	53	67	875	140			8	31	53	1,365
Whitefish	703	1,254	3,358	2,291	6,753	25,718	34,583	7,771	1,071	47	55		85,557
Whitebait	53,974	29,941	66,945	43,554	17,106	2,311	2,301	18,729	24,226	29,831	39,541	39,605	368,064
Yellowtail	118,403	63,435	225,784	341,133	620,562	696,548	487,083	747,328	583,435	417,724	374,288	347,731	5,023,114
Miscellaneous	12,042	23,740	34,040	21,136	24,104	13,772	20,408	19,067	15,968	12,578	17,263	16,006	230,124
Total fish	51,632,451	64,791,970	48,776,901	6,683,655	8,213,402	9,575,331	9,407,827	26,745,144	46,151,029	44,539,993	42,335,416	23,492,395	382,345,514
Crustaceans and Mollusks:													
Crabs	458,332	419,040	448,992	254,760	358,560	234,288	245,496				311,832	565,080	3,296,380
Shrimps	47,884	42,588	102,735	109,196	140,107	190,119	168,381	185,037	73,666	150,789	127,638	93,371	1,431,511
Spiny Lobster	166,527	90,660	114,679	17,421						144,103	336,209	305,624	1,175,223
Abalones	71,124		34,642	211,820	153,455	288,988	333,555	350,228	232,489	101,085	122,177	161,207	2,060,770
Clams—Cockle	4,990	2,999	5,256	321	233	448	1,743	348	456	83	278	721	17,976
Clams—Mixed	6,615	1,547	2,494	4,222	5,649	3,818	577	412	2,501	2,959	1,569	2,739	35,202
Clams—Pismo	25,190	15,054	16,273	23,753	28,097	29,255	28,775	27,767	25,319	21,889	17,489	15,447	274,317
Clams—Softshell	20,386	22,133	22,722	22,033	21,066	21,806	20,637	21,988	20,934	19,050	17,803	15,404	245,962
Cuttlefish	9,048	3,235	9,146	7,652	7,295	7,520	6,378	4,063	3,287	2,621	2,223	836	63,304
Mussels	361	709	1,267	1,265	1,619	1,596	2,202	1,336	1,113	940	1,040	1,006	14,614
Oysters—Eastern	53,570	48,015	48,510	44,315	28,305	20,561	19,981	27,498	32,949	69,776	83,726	113,216	610,422
Oysters—Native	360												360
Squid	5,548	4,185	39,247	120,378	2,255,473	617,120	4,598		1,280	150	43,251	44,331	3,135,361
Grand totals	52,502,295	65,442,195	49,622,864	7,500,891	11,213,261	10,990,850	10,240,250	27,363,821	46,565,023	45,053,438	43,400,751	24,811,377	394,707,016

1926

TABLES SHOWING THE MONTHLY CATCHES LANDED IN CALIFORNIA FOR THE TWO YEARS 1926 AND 1927

1927

Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
Albacore						251,494	1,623,472	1,911,010	487,170	286,441	14,373	5,407	4,579,367
Anchovies	6,360		18,789	20,976	73,842	71,003	57,020	58,225	41,093	16,080	4,170	643	368,201
Barracuda	252,601	272,065	289,413	496,066	1,295,454	846,596	576,048	724,498	345,703	450,934	311,196	339,165	6,199,739
Bonito	19,218	7,491	3,655	13,113	3,880	66,461	261,636	234,760	307,488	531,091	192,274	76,941	1,718,008
Carp	4,382	11,085	16,633	6,066	5,434	558		5,209	3,651	331	4,570	5,095	63,014
Catfish	13,353	24,296	48,076	39,725	28,060			30,726	44,890	54,800	56,059	31,318	371,303
Cultus Cod	41,358	19,810	58,282	61,784	18,772	21,283	39,957	79,972	51,732	22,549	56,005	84,804	556,308
Eels											5		5
Flounders	32,377	29,063	130,954	43,604	44,631	8,312	29,160	37,706	69,663	108,165	27,348	29,081	590,064
Grayfish	48,544	57,796	36,432	11,383	7,539	19,543	10,882	15,760	10,743	20,058	37,687	49,286	325,653
Hake	2,485	127	917	3,485	24,835	12,780	14,152	17,375	4,970	2,395	565	467	84,553
Halibut	104,260	124,863	271,053	162,347	195,859	152,779	196,695	252,510	166,634	127,380	69,174	48,677	1,872,231
Hardhead	5,321	5,040	1,372	64						700	8,025	12,367	32,898
Herring	279,004	311,085	190,126	33,570	1,050	530					590	352,366	1,168,321
Kingfish	59,929	64,254	103,689	33,298	49,623	42,275	33,986	31,796	13,881	28,844	36,943	30,749	529,267
Mackerel	447,845	356,223	341,558	272,280	333,527	342,548	306,072	326,155	271,415	482,863	429,533	830,620	4,740,639
Mackerel—Horse	30,256	31,627	52,001	19,455	26,526	19,716	55,906	29,565	38,753	79,922	29,695	58,974	467,376
Mullet	242	4,498	12,324	5,408	1,088	2,826	5,775	2,387	1,160	514	1,254	2,581	39,976
Perch	9,451	21,105	68,507	51,283	1,091	1,954	21,783	28,259	16,322	10,754	17,019	15,455	262,893
Pike	688	1,349	2,595	786	313	30		25	34		384	661	7,865
Pompano	4,533	9,057	9,534	16,128	13,511	880	228	474	32	124	492	134	55,127
Rock Bass	29,490	31,493	18,312	35,402	39,610	99,026	96,927	56,352	27,828	28,146	31,145	32,109	525,840
Rockfish	774,611	524,505	1,111,313	657,354	503,622	534,796	226,965	283,812	295,365	412,268	525,322	540,671	6,390,604
Sablefish	8,997	20,824	94,310	100,522	98,340	89,704	84,530	63,297	163,370	150,361	83,999	34,400	992,654
Salmon	6,230	1,942	12,745	240,149	1,034,688	952,696	1,890,945	1,677,263	541,476	75,435	77,906	434	6,511,929
Sandabs	33,229	46,173	63,278	75,800	92,548	92,470	80,163	103,720	73,742	95,567	73,049	62,889	892,718
Sardines	58,177,067	42,626,629	47,036,936	3,193,427	11,918,019	4,628,928	18,413,552	24,269,333	50,355,760	20,151,468	26,416,150	35,088,020	342,275,289
Scalpin	13,227	9,145	14,576	11,230	13,085	3,308	8,881	8,126	11,775	4,263	6,267	8,150	114,299
Sea Bass—Black	38,573	40,466	17,986	12,722	12,280	35,590	65,294	47,412	16,926	45,626	30,901	105,819	467,595
Sea Bass—White	274,592	287,804	262,699	38,639	130,958	418,382	243,956	323,161	140,585	82,896	22,442	47,383	2,273,407
Shad	62	646	250,900	2,314,536	1,522,231			8,758	3,201		2,094	295	4,103,423
Sheepshead	28,665	15,612	12,652	11,846	5,646	2,218	1,673	3,348	6,304	10,524	22,597	38,312	159,397
Skates	14,116	36,907	51,495	27,441	20,399	7,200	6,031	12,843	22,909	18,215	23,340	22,819	263,715
Skipjack	50,543	32,572	53,413	831,667	293,451	739,676	60	7,581,877	14,553,276	6,609,555	1,896,750	1,064,120	33,805,960
Smelt	65,546	42,750	108,189	84,753	60,159	86,422	52,882	105,828	106,970	103,970	89,787	58,665	965,921
Sole	1,031,856	456,900	736,742	892,856	814,281	1,003,696	864,134	892,831	968,142	725,556	923,059	1,169,702	10,479,765
Solittail	3,668	2,798	448	100	15				58	296	1,296	1,922	10,601
Striped Bass	35,330	45,227	109,222	155,037	75,126			130,484	32,580		39,400	25,188	647,594
Suckers	290	42	181	262	235						5	5	1,020
Swordfish				595		4,360	20,707	38,920	43,648	20,596	1,462		130,288
Tomcod			250					315			125		690

1927

Tuna—Bluefin						984,065	1,436,911	656,223	1,044,444	224,118	29,099	523,535	4,898,386
Tuna—Yellowfin	156,817	296,211	822,310	2,752,228	4,056,839	912,257	1,733	1,181,321	5,690,290	4,234,459	3,634,517	2,195,963	25,934,045
Turbot	49	119	140	83	498	723	1,327		47		505	459	3,950
Whitebait	1,931	7,376	10,275	22,878	30,869	32,008	13,786	5,376	2727	5,136	1,792	445	134,149
Whitefish	46,675	33,532	35,770	23,033	23,290	24,866	19,888	7,423	3,685	19,288	25,623	49,129	313,102
Yellowtail	36,012	10,989	111,880	278,939	106,146	153,676	359,633	679,541	303,832	1,113,141	749,926	321,138	4,224,853
Miscellaneous	22,036	17,878	21,123	20,159	15,451	12,945	11,769	20,423	13,848	11,057	20,781	19,983	207,453
Total fish	62,220,819	45,939,293	52,613,755	13,073,453	22,993,731	12,680,580	27,129,519	41,944,399	76,297,681	36,455,986	36,026,701	43,385,446	470,761,365
Crustaceans and Mollusks:													
Crabs	445,800	390,864	297,216	363,120	311,640	346,152	31,608				304,392	469,920	2,960,712
Shrimps	93,039	44,749	92,504	96,862	140,817	158,789	152,669	185,405	207,492	210,888	152,627	150,524	1,697,365
Spiny Lobsters	266,165	244,076	160,040	69,992						140,480	322,204	288,001	1,490,958
Abalones	65,912		241,256	469,341	199,683	212,924	355,846	435,242	126,425	59,922	352,056	297,923	2,816,530
Clams—Cockle	629	481	1,149	811	552	693	859	596	85		53	6	5,914
Clams—Mixed	6,199	8,702	8,945	7,167	7,715	5,317	2,769	1,937	1,397	4,648	4,326	5,541	64,663
Clams—Pismo	13,956	11,019	19,996	18,768	20,727	22,343	20,171				1,535	4,485	133,000
Clams—Softshell	14,604	14,454	15,737	16,805	13,333	12,799	13,940	10,665	13,139	9,110	8,307	8,490	151,383
Cuttlefish	3,198	823	3,839	3,358	5,064	7,144	6,616	5,857	244	176	125	249	36,693
Mussels	2,258	1,393	10,398	5,962	5,500	3,705	360					55	29,631
Oysters—Eastern	63,525	65,054	58,576	50,600	34,540	33,858	14,355	14,135	15,576	52,415	63,112	89,175	554,921
Squid	2,105	25,115	19,479	159,942	3,924,376	1,453,325	52,360		525	21,561	67,485	287,840	6,014,113
Grand totals	63,200,209	46,746,023	53,542,890	14,336,183	27,657,678	14,937,629	27,781,072	42,598,236	76,662,564	36,955,186	37,302,923	44,996,655	486,717,248

NOTE.—The tables showing the landings of tuna in southern California will be subject to certain additions to be noted in a future publication when the complete results of an audit of cannery books are available.

1927

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CALIFORNIA DIVISION OF FISH AND GAME
FISH BULLETINS

* No. 1. Report on Fish Conditions. 1913; 48 pp., 3 figs. Contains:

The Abalone Industry in California. By Charles Lincoln Edwards.
The Towing of Salmon and Steelhead Fry from Sacramento to the Sea in a "Live Car." By N. B. Scofield.
The Problem of the Spiny Lobster. By Bennet M. Allen.
Investigation of the Clams of California. By Harold Heath.
Investigation of the Life History of the Edible Crab (Cancer magister). By F. W. Weymouth.
A General Report on a Quinnat Salmon Investigation Carried on during the Spring and Summer of 1911. By N. B. Scofield.
Trout and Black Bass Planting and Transplanting in the San Joaquin and Southern Sierra Districts. By A. D. Ferguson.

* No. 2. The Scientific Investigation of Marine Fisheries as Related to the Work of the Fish and Game Commission in Southern California. By Will F. Thompson. 1919; 27 pp., 4 figs.

* No. 3. The Spawning of the Grunion (Leuresthes tenuis). By Will F. Thompson, assisted by Julia Bell Thompson. July 15, 1919; 29 pp., 9 figs.

No. 4. The Edible Clams, Mussels and Scallops of California. By Frank W. Weymouth. Jan. 10, 1921; 74 pp., 19 pls., 26 figs.

* No. 5. A Key to the Families of Marine Fishes of the West Coast. By Edwin C. Starks. March 3, 1921; 16 pp., 4 figs.

* No. 6. A History of California Shore Whaling. By Edwin C. Starks. October, 1922; 38 pp., 22 figs.

* No. 7. The Life History and Growth of the Pismo Clam. By Frank W. Weymouth. 1923; 120 pp., 15 figs., 18 graphs.

* No. 8. Racial and Season Variation in the Pacific Herring, California Sardine and California Anchovy. By Carl L. Hubbs. February, 1925; 23 pp., 4 pls.

* No. 9. Preliminary Investigation of the Purse Seine Industry of Southern California. By Tage Skogsberg. 1925; 95 pp., 23 figs.

* No. 10. The Life History of Leuresthes tenuis, an Atherine Fish with Tidecontrolled Spawning Habits. By Frances N. Clark. October, 1925; 51 pp., 6 graphs, 7 pls.

No. 11. The California Sardine. By the Staff of the California State Fisheries Laboratory. 1926; 221 pp., 74 figs.

Thompson, Will F. The California Sardine and the Study of the Available Supply.
Sette, Oscar Elton. Sampling the California Sardine: A Study of the Adequacy of Various Systems at Monterey.
Higgins, Elmer H. A Study of Fluctuations in the Sardine Fishery at San Pedro.
Thompson, Will F. Errors in the Method of Sampling Used in the Study of the California Sardine.
Scofield, W. L. The Sardine at Monterey; Dominant Size Classes and their Progression, 1919-1923.

No. 12. The Weight-Length Relationship of the California Sardine (Sardina caerulea) at San Pedro. By Frances N. Clark. 1928; 58 pp., 11 figs.

No. 13. The Seasonal Average Length Trends at Monterey of the California Sardine (Sardina caerulea). By Carroll B. Andrews. 1928; 13 pp., 6 figs.

No. 14. Reports on the Seals and Sea Lions of California. By Paul Bonnot. 1928. 61 pp., 38 figs.

No. 15. The Commercial Fish Catch of California for the Years 1926 and 1927. By the Bureau of Commercial Fisheries. 1929; 94 pp., 52 figs.

These bulletins are offered in exchange for the publications of other bodies engaged in marine research. Address: California State Fisheries Laboratory, Terminal Island, California.

* Out of print.