

California. Dept. of Fish and Game.
Biennial Report 1883-1884.

REPORT
OF THE COMMISSIONERS
OF FISHERIES
FOR THE
STATE OF CALIFORNIA
1883-4.

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Biennial Report 1883-1884.

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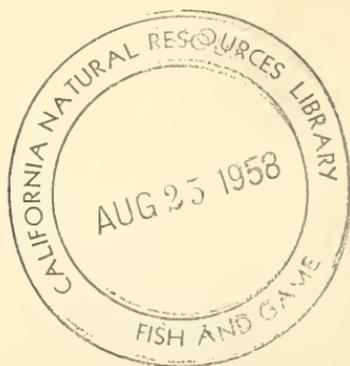
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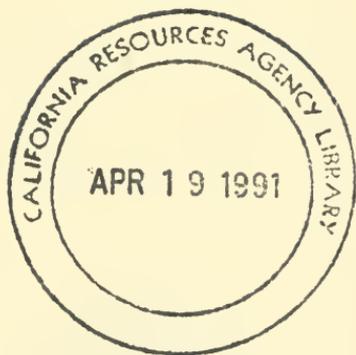
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REPORT
OF THE
COMMISSIONERS OF FISHERIES
FOR THE
STATE OF CALIFORNIA,
FOR THE
YEARS 1883-4.

COMMISSIONERS OF FISHERIES.

A. B. DIBBLE, Grass Valley, Secretary and Treasurer.
R. H. BUCKINGHAM, Sacramento, President.
J. D. REDDING, San Francisco.



SACRAMENTO:
STATE OFFICE JAMES J. AYERS, SUPT. STATE PRINTING.
1884.

REPORT.

To his Excellency GEORGE STONEMAN, Governor of California:

The Commissioners of Fisheries for the State of California, appointed under an Act of the Legislature, entitled "an Act to provide for the restoration and preservation of fish in the waters of the State," approved April 2, 1870, respectfully submit their eighth biennial report.

SALMON.

This most important of our inland water fish is in great demand, not only by all our citizens for table consumption, but also by the numerous canneries, some twenty-one in number, situated on the banks of the Sacramento, the bays, and in San Francisco, having increased their business in the last few years to large proportions. The average pack now is about 200,000 cases per annum. The boats employed in 1883, in taking salmon, were about 1,200, and are increasing in number. The average catch to each boat is about 1,500 fish, weighing about 21,600,000 pounds, per annum.

The increase of catch for the last three years caused a marked decrease in the supply for the year 1883, with a chance of a more marked decrease for the year 1884, the causes of which are many, viz.:

First—Illicit fishing done during the close season.

Second—Loss of salmon in the tules.

Third—The consumption by seals and sea-lions, which are very destructive to salmon and other fish. They follow the fish from the Golden Gate to Rio Vista.

Fourth—The different kinds of aquatic birds, which are very numerous, and very destructive to the young of all kinds of fish as they are descending from the spawning grounds to the ocean.

Fifth—Dams and other obstructions near their spawning grounds.

These are the principal difficulties over which the Commissioners have no control, except as to the first.

THE VIOLATORS OF THE LAW.

The Commissioners have exercised their power to abate the evil of illicit fishing, but owing to the limited means at their command, they have been unable to do all that was required to be done. There has been in that direction a great amount of work performed, in different parts of the State, the most of which was done on the lower Sacramento and San Joaquin Rivers, and the bays of Suisun, San Pablo, and San Francisco.

During the close season of 1883 the Commission placed a patrol upon the rivers and bays, which has had a very wholesome effect.

Mr. W. C. Jones, the Deputy Commissioner, had charge of the patrolmen employed, and did good service, as his annexed report shows.

The marked increase of salmon caught in the last few years is on account of the demand from the canneries. During the heavy run in former years, the fishermen did not work more than one third of the time. The canneries take the most of the catch from the first of April to the fifteenth of July, and from the first of September to the middle of October. The fishermen work most of the time, say eighteen hours of the twenty-four.

It is necessary for the Commission to plant as many young salmon as can be procured, at the headwaters of the Sacramento, in order to keep up the supply. Owing to the breaking of the waterwheel of the United States hatchery on the McCloud River, and to other causes, the supply of young fish was cut short in the year 1883 more than 3,000,000. It will be necessary for the California Commissioners to plant not less than 4,000,000 young fish each year, in order to meet the heavy drain continually going on.

The present Commission has used considerable exertion against the violators of the fish laws, but unless some stringent legislation is obtained, our streams and bays will soon be without a needful supply of salmon and other fish.

The large demands that came from the packing houses in the year 1883, caused an unusual amount of fish to be taken. During this season, which has been an unusually short one, the amount of fresh salmon, which has been packed, amounts to 451,957 Spring salmon, and 160,542 Fall salmon, aggregating 7,349,998 pounds. The amount of fresh Spring salmon sold in the markets was 115,004, and of Fall run 52,902, aggregating 2,235,684 pounds; total number of pounds sold and canned in the year 1883, 9,585,672 pounds. These statistics do not include 60,000 or more caught above Sacramento City. In order to meet this immense drain, it will be necessary to have at least one hatching house belonging to the State on the Little Sacramento, or the McCloud, or Pit Rivers.

From the fifteenth day of October, 1883, until the first day of January, 1884, the run of salmon was very good, and especially in the month of January, as there were more caught during that month of what is termed the Winter run, than in years past. The cause was probably on account of the stage of the river, which was extremely low for that season of the year. The Spring run was retarded in consequence of the low water, and no considerable amount of fish was caught until after the twentieth of March. The outlook for a heavy run early in the season was not promising, there being less fish observed outside the Bay of San Francisco than for a number of years preceding.

The decrease of salmon in the McCloud River, in 1883, was caused by the continual blasting on the line of the Northern Pacific Railroad, above Redding; this caused the fish to stop below the United States hatchery, at Bairds, only allowing very few fish to ascend to their spawning grounds. It was a cause that could not be avoided.

Mr. Livingstone Stone, the Deputy United States Fish Commissioner for this coast, did all in his power to catch as many fish as would fill his contract with the Commissioners of this State (4,000,000), but did not succeed by about 3,000,000. The Commissioners desire not less than 4,000,000 each year in order to keep up the supply and to increase the number. The demand is increasing every

year, and, unless the number of young fish can be increased, our run of salmon will be less every year. In the year 1883 there were caught not less than 300,000 more than the Commission planted. A considerable number of salmon spawn in different streams, quite a large proportion running into the Sacramento and San Joaquin Rivers; and, in fact, we feel assured that most of the Fall run of salmon never reach the McCloud, but deposit their ova upon the bars between Colusa and Red Bluff.

EIGHTEEN HUNDRED AND EIGHTY-FOUR.

The run of salmon during this year has been very late. The Spring run was very light up to and after the first of April. During the month of April the run started in with a small catch, and remained so until the first of May, when a small increase was noticed for about two weeks; then the run slackened, and by the middle of May the fish were very scarce, and continued scarce all through May, resulting in the smallest take in a number of years.

The June run, which in ordinary years has been the heaviest, resulted in a very small showing; a heavy decrease for the Spring run.

The causes for the scarcity of salmon for the year 1884 are several, viz.:

First—The loss of fish in the tules in the years 1881 and 1882.

Second—The using of small mesh nets from 1877 up to 1883, and the increase of seines at or near the spawning grounds. The increase of nets used in the bays leading to the river has also caused a great decrease. The river is at times apparently completely dammed by nets.

The pack of salmon on the Sacramento for the year 1884 will fall short fully one half from that of the year 1883, although more than ordinary exertions have been made by the fishermen to obtain them.

The Commissioners in their report of 1878-9 predicted a heavy run of fish in the Sacramento River for the years 1883 and 1884, but, for the various causes mentioned, their predictions have not been fulfilled.

The Fall run of salmon of 1884 has been the lightest that was ever known in the memory of the oldest fisherman. On the first and second days of September the run was not as heavy as it should have been during the same days in the month of October. There is no cause known to the Commission for the marked decrease in the Fall run this year, as the Fall fish have invariably taken care of themselves.

EASTERN SALMON.

These are a different species and are entirely unknown to the Pacific Coast. They inhabit the waters north of the forty-first degree of latitude, and are never seen south of that degree. They are caught in great numbers as high north as the coast of Norway.

The California, or Chinook, are taken in lower degrees of latitude than any other kind of salmon, and run down as low as thirty-seven degrees north, which we believe is as low as they are ever caught. This is occasioned by the temperature of the water, which in some seasons of the year reaches as high as eighty degrees Fahrenheit.

At the time when the fish are seeking their river spawning grounds they begin to fail in quality as food (although they are used by a great many), and large numbers are secured just before spawning, by fish-

ermen and others, on the upper waters of the rivers. Numbers of fishermen have been known to catch and sell salmon immediately after spawning and upon the spawning grounds, when the fish were wholly unfit for human food. This grievous evil, in our opinion, should be prohibited by very stringent laws.

TRUCKEE TROUT.

Of this species of fish, most are taken in the State of Nevada, on account of the various dams in that State, which are constructed in such form that it is impossible for trout to raise over them. Unless the State of Nevada does something towards dam abatement, the Truckee River trout will be a fish of the past in a very short time. Although the citizens of Nevada stoutly deny this fact, it appears strange that no trout are caught above the Nevada State line, when in former years they were abundant the whole length of the river from Pyramid Lake to Lake Tahoe.

Commissioner Dibble visited several of the dams in the State of Nevada, and in his report, before the meeting of the Board held on the fourteenth day of April, 1884, he stated that the statements of the mill owners on that portion of the river in California were correct, in that it was impossible for trout to ascend the Truckee above Foulkes' Dam, near Verdi, in the State of Nevada.

LAND-LOCKED SALMON.

The Commission received from Mr. Atkins, Deputy United States Fish Commissioner at Bucksport, State of Maine, 30,000 eggs of the Shadoc salmon. They were received on the seventeenth of March, 1884, in good condition, and were hatched with only a loss of seven and one half per cent. They were distributed in the lakes as follows:

Bigler.....	15,000
Donner.....	5,000
Webber.....	5,000

The plant of land-locked salmon by the former Commissioners has only been a partial success. Very few of the fish have been taken as yet, although a better showing is looked for. At present writing, the catch has been about the same as last season, no great amount having been captured.

PERCH.

In former years this fish was very plentiful, but has become very scarce in the last few years, owing to several causes, viz.:

First—We believe the greatest cause of disappearance is due to the reclamation of our tule lands by closing the sloughs, whereby ingress and egress is stopped, causing them to deposit their spawn in the rivers, and the spawn is lost by being covered with sediment.

Second—By a continual drain upon the supply by Chinese and other fishermen, who are ever on the alert to find their hiding places.

In our opinion a law should be passed to protect them from seine fishing for at least two years.

For some reason the run of perch has been better this year (1884) than for a number of years past, owing, probably, to the several

breaks in the levees between Knight's Landing and Cache Slough, on the Sacramento River, which has allowed the fish egress from the shoal lakes into the tules. Perch are taken in all the lower rivers and streams of the Sacramento and San Joaquin; also in Clear and Tulare Lakes. They do not appear to have decreased in those waters where reclamation has not been so extensive, as in those tule districts above mentioned, but appear to be as plentiful as formerly.

It is not the habit of the perch to ascend very high in any of the streams, but they confine themselves to the more sluggish portions of the waters of the State, lakes and ponds, which seem to be their favorite haunts.

CHUB.

This fish, a great favorite with the Indian and Mongolian races, has been scarce for the past few years, but are now becoming more plentiful, the probable cause of increase being the breaking of the levees in the overflowed districts, which gives the fish a chance to return to the river. The outlook for the year 1884 is good for a fine run, from the fact that in the month of March they were numerous in the river, and, as the run lasts generally two or three months, we may expect a large increase from last year; their habits being similar to the perch, the probabilities are that the same causes lead to the same effects.

PIKE.

With reference to the pike, we repeat the same statement made in regard to perch and chub. The pike is more plentiful at the present time than most of our strictly inland fish. They ascend the rivers higher than most of the other kinds and are thereby protected, as most of the fishermen do not follow them very far up the river. As they are not taken in quantities except by those who fish with fyke nets, they ascend the river as far as Red Bluff. They are said to be a great enemy to the young salmon. They are a good table fish for baking or boiling.

The pike run commences with the channel pike in the month of December, and with the bar or school pike in the month of March. They vary in size from one half pound for bar to twenty-four pounds for channel; there is a marked increase for this year.

These fish are known on the upper waters as whitefish, although they bear no resemblance to the eastern fish of that denomination.

DACE.

The dace, a native of our rivers and lakes, were never very plentiful, and are on the decrease. They are similar in shape, but are different in color from the pike, being of a yellowish brown on the back, and a dingy white on the sides and stomach. The dace are nearly extinct; from what cause, the Commissioners are unable to ascertain at present.

MULLET (OR HARD-HEAD).

The mullet or hard-head is one of the most common of our inland fish, and is used more by the Chinese than by any other class of people—their extreme cheapness being the great desideratum. They are taken in large numbers during the Fall and Winter months.

They inhabit the lakes and sloughs, and also the rivers, but, like some other species of fish mentioned, are getting scarce. In our opinion, they need no protection.

CARP.

The carp has been introduced into the State by the United States Commissioners. They have proven a great success. They do well in any of our lakes and ponds, natural or artificial, and are one of the most prolific of all of the inland-water fish. The condition of the water, whether clear or otherwise, so long as vegetation exists therein, is agreeable to the carp. They are truly vegetarian in regard to diet; living and thriving upon vegetable food. It is the opinion of the Commissioners that the carp are a fish that will come into general favor with the middle class of our citizens, as they can be raised very cheaply by artificial methods. They are well known in China, where they are raised almost entirely by artificial means.

The carp will never be a fish sought after by our Waltons, as they are a fish that seldom take the hook.

Opinions differ in regard to the quality of carp as a food fish; the flesh being of a rather coarse order. They are not so highly flavored as some other kinds of fish.

The carp are already being taken in the Sacramento River, and in some of the lakes bordering on it—not in any great numbers as yet, but enough have been caught to show that they thrive well in our waters. The Commissioners are well satisfied that, in a few years, there will be any quantity of them, as they increase rapidly.

STURGEON.

This is one of our best and cheapest food fishes, and is coming more in favor with all classes of our citizens, and, like most other kinds of food fish, is steadily on the decrease in numbers. This is due almost wholly to the mode of fishing resorted to by the Chinese.

The catch for the year 1883 fell short fully fifty per cent from the result of the catch the previous two or three years. Unless something is done in the way of legislation, the State will, in a few years, be without this kind of fish, one of the best of cheap food fish that inhabit our waters.

In the opinion of the Commissioners, a law should be enacted to protect sturgeon less than twenty-four inches in length. The small ones are not marketable fish, but are dried and sent to China by the Chinese fishermen, who are the only ones that follow that line of the business, they having monopolized the sturgeon trade.

There are two species of this fish that visit our waters; one called the green, and the other the white. They are both good food fish. There is a difference of opinion as to which kind is the best; the majority, however, favor the white.

CATFISH AND BULLHEADS (OR POUT).

These fish were introduced into our waters by the late Commissioners, and have thrived wonderfully. All of the lakes, ponds, and sloughs of the central portion of the State are well stocked with them. It has been stated by fishermen that they would destroy all the native

fish. It is our opinion that it was a timely act on the part of the former State Commissioners to plant them just when they did, as our native fish were giving out. They are caught from the mouth of the Sacramento River as far up as Tehama, a distance of about two hundred miles. They are a fish that need no protection. They are so prolific that it is a question if they can ever be exterminated.

Catfish proper are not so plentiful as the bullhead. It is a mistaken idea that all the fish that are called catfish are so in reality. There are two distinct species, however, bearing a near resemblance to each other; the catfish having a peculiar build and a swallow-tail, while the bullhead or pout has a square tail. The pout seems to take to the lakes, while the catfish prefer the river, and are seldom caught in the lakes. They are coming more into favor with our citizens every year. The prejudice that existed at the time of their introduction is fast dying out, and the majority of our people claim that they are a better food fish than the carp. Whether such be the fact is a matter of taste.

The idea that they would destroy our native fish is a fallacy, as, in the last two years, statistics tend to show that such is not the fact. In this statement the disciples of the famed Izaak Walton, we think, will bear us out.

There is also in our lakes and rivers a small native catfish, not very plentiful, and too insignificant to call for any extended notice, the fish being seldom over four inches in length.

WHITEFISH.

This is what might be termed a land-locked shad. The results accruing from the planting of this kind of fish in our waters are not fully known to the Commissioners. They are a fish that do not take the hook, and, as our laws protect the lakes in which they were deposited from all kinds of nets, we have no reliable data as to whether they are a success or not. There are native whitefish that are caught in Lakes Bigler and Donner, which have been taken for those planted by the former Commissioners, but they are different in form from the eastern, being longer and more slim in build, and not so full in the shoulders.

The native, or river whitefish, are taken in great numbers, and are called fresh water herring. They are to be found in all the streams in the State; are small in size, from one half to one pound each. They are in great favor with the Chinese.

There has been no showing of the eastern whitefish so far, although it is five years since they were planted. Up to August thirtieth not one has been taken, so far as the Commissioners have any knowledge.

SHAD.

Since the Commissioners first planted shad in our rivers they have done well, so much so that the whole Pacific Coast can now be said to be well stocked. They have been taken from Monterey Bay on the south, to British Columbia on the north. The shad have large breeding grounds in the waters of the center of the State; their increase has been marvelously great. We have no accurate means of knowing the amount of shad that can be taken in a single day. Enough is known, however, at the present time, to assure us that an unlimited supply can be had in the proper season.

Of all the migratory fish in our waters, the shad is one of the most prolific. Our tule lakes are splendid spawning grounds for them. During the year 1883 the law to protect shad was in force; fishermen who caught them generally returned them to the water, but enough were caught to assure the Commissioners that they had greatly increased in numbers and growth, some being seined that weighed nine and three quarter pounds.

It is the opinion of the Commissioners that California is the only State in the Union where shad can be taken and marketed the year round.

STRIPED BASS.

This most desirable fish is not a native of our waters. A few were planted by the former Commissioners in the Bay of San Francisco at Army Point. In the opinion of the Commissioners they will be a success, as they have been taken in the Bay of San Francisco weighing four pounds, and one taken in the Bay of Monterey in September, 1883, weighed nearly seventeen pounds. It will be some time before striped bass will be very plentiful, as the immense area in which they travel will have to be well stocked before any one place would have any considerable number for the fishermen to work upon. In October, 1883, one was caught in the Sacramento River weighing sixteen pounds. This and other catches are strong evidence that the striped bass will propagate in our waters. The Commissioners find that by reason of thus stocking our bays the whole Pacific Coast is benefited, as in the case with shad. Bass have been taken as far north as British Columbia.

March third, 1884, a striped bass, weighing four pounds, was for sale in a San Francisco market. March eleventh there was one offered for sale that weighed eighteen and one half pounds. It seems to us that most of the eastern fish assimilate themselves very readily to our waters.

SALT WATER FISH.

ROCK COD, OR GROUPEL.

This fish abounds in great numbers all along the Pacific Coast. The markets of California are well supplied from the Bays of San Francisco, Monterey, Tomales, and from Punta Arenas and the Farallone Islands; they are caught with hook and line near the rocks and are always in good demand.

Their habits compare with the blackfish of the New England Coast. There are as many as five different varieties; the red is considered the most numerous of all. In the last ten or fifteen years the markets received the most of their supply of this fish from outside the Bay of San Francisco. The decrease in the bay is owing to the same conditions as have caused the decrease of the inland or fresh water fish. They are gradually lessening in number by the continual drain upon them, occasioned by the various devices which our cosmopolitan fishermen use in their capture.

The immense number of small fish of all kinds annually destroyed by the Chinese and other fishermen in the bay, compel the marketmen to look further abroad for their daily supply, as not more than one half of that supply is obtained in the vicinity of San Francisco.

In former years most of the supply was obtained in and around the bays; at present the bays of Monterey, Tomales, Point Reyes, and other points along the coast, north and south, come in for their share of the market supply. As the consumption increases about ten per cent per annum, increasing with the increase of our population, the outlook for years to come is not promising. The Commissioners know of no way to increase the supply of fish of the varieties that are strictly indigenous to our salt waters, as the greater number of species are migratory in their habits—only few kinds remaining the year round in our waters. The best varieties of salt water fish are flounders, soles, turbot, and tomcod, which are taken in good quantities in the inland bays, the greater portion in San Pablo Bay. Sea perch, or porgy, as they are termed in the New England States, are a fine pan fish. Ours, in appearance, are darker in color than the eastern. Herring are considered the most plentiful of all our food fish. They are caught in great numbers in the Winter months, and are always in great demand.

BAY FISH.

San Pedro and San Diego Bays furnish most of the crayfish that are used in the markets of the State. Shoalwater Bay furnishes all of the native oysters, and a large proportion of the clams that are used in the various markets of the State. It is a well known fact that at the present time a large percentage of the food fish that are used throughout the State come from outside bays and rivers; only a small per cent being caught within the Bay of San Francisco.

In the opinion of the Commissioners the catch of all kinds of fish will decrease to a considerable extent in the next five years, if the Chinese are allowed to fish with what is known as bag-nets, for the purpose, as claimed by them, of taking shrimp. The nets they use are so small in size of mesh that they catch and destroy the young of all kinds of food fish by the hundreds of tons annually.

Monterey supplies annually a large number of fish of all kinds to the markets of San Francisco and the State.

EELS, BLACK BASS, AND LOBSTERS.

Eels, placed in our waters by the former Commissioners, have not been a success. It is probable that the place where they were deposited, and where they have made their home, has not yet been discovered; at all events, none have been taken since they were planted. It seems to us that they ought to do well in our inland waters, as they are fond of the bottoms of ponds or streams where mud prevails, as is the case in our lakes and rivers.

Black bass, in our opinion, would do well in all of our large-lakes, such as Bigler, Donner, Webber, Clear, and Tulare.

Lobsters may not do well in our latitude. They are not caught in any considerable numbers below forty-one degrees north on the Atlantic Coast. In the opinion of the Commissioners it would be useless to expend any considerable amount to renew the lobster experiment.

In some of the lakes near San Francisco, quite a number of black bass have been taken, and they seem to have done very well.

In this report, the Commissioners who have signed it deemed it proper, in the naming of the various species of fish, to avoid Latin

nomenclature, and to call them by the good old Saxon or provincial names by which they have been known to our fishermen and people.

NOTES BY THE COMMISSIONERS.

The fish interest is on the increase all along the line, from the Oregon Coast to the line of Mexico, every bay having its well established fisheries, which send the greater proportion of their catch to San Francisco, where they find a ready market.

Most of the salmon which are exhibited for sale in the months of November, December, and January, are taken up the coast at Point Arenas, Little River, Eel River, Bolinas, and Rogue River. The species consists of what is known as the coast or steel-head. There are a few of the salmon taken at other points that are indigenous to the waters of the Sacramento River.

We would also respectfully state that when the present Commissioners were appointed they were at a loss to know where to commence, as the head of the old Commission, Hon. B. B. Redding, died a few months before, and the only one left was the Hon. S. R. Throckmorton, who was at the time in very poor health; and he also died in a month or so after our appointment, leaving us without any one to confer with who had any knowledge of what was to be done or where to commence. We entered upon our duty as strangers to the business, and it may have cost more to carry on the needed work than it did our predecessors, but when taking into consideration the amount of work done by the present Commission, we confidently believe that the people of this State will approve of our action and endeavors to secure and advance its fish industry.

The present Commissioners have used earnest endeavors to protect the fish interest from the unlawful raids made by unprincipled fishermen during the close season, by employing and placing a patrol on the various bays and watercourses of this State, which action has resulted in great benefit. During the month of August, 1883, the Commission caused the arrest of thirty-six violators of the fish laws, chiefly Greeks and Italians; all were convicted and fined. During the months of September and October, 1883, forty-eight Chinese were arrested for violating the provisions of Section 636 of the Penal Code, by fishing with set-nets, and in nearly all cases convictions were obtained. The Legislature should pass a very stringent law prohibiting the use of set-nets, whether for catching of shrimp or fish; shrimp nets especially are more destructive to the young of all varieties of fish than any other nets used, from the fact that while the fishermen, who are fishing for the market, use nets that will catch nothing but marketable fish, on the other hand, those parties who catch shrimps have their nets made of so small sized mesh that it is impossible for the young of any kind to escape therefrom, thereby catching and destroying immense numbers. The only way to avoid the evil is to stop the catching of shrimp except by the use of proper seines. If the mode adopted by the Chinese is allowed to be continued, in a few years they will have the Bay of San Francisco entirely drained of all kinds of food fish. The number of small fish, shrimp, etc., so taken by the Chinese, and by illicit fishing, amounts to thousands of tons per year. The distribution of fish, in 1883, was not as large as in former years, on account of the fact that the United States Commissioners did not send to the State of California any kinds of fish that

they had been accustomed to furnish in former years. Our Commission has sent out from the Shelby hatchery and distributed, between the twenty-first of May, 1883, and the first of January, 1884, over 95,000 trout.

In December, 1883, there were placed 600,000 young salmon in the McCloud River by the United States Fish Commission, at the expense of \$600 to the State of California.

On April 13, 1884, the California Commissioners planted over 200 carp in the lakes of Yolo County, and on April 25 placed a number in China Slough, Sacramento County.

The present Commissioners of the State of California have been unable to place new varieties of fish in the waters of the State, from the fact, mainly, that the United States Commission has not been able to furnish the much desired and needed supply. The United States Commissioner, Hon. Spencer F. Baird, in making annual distribution of fish, up to the year 1883, favored California with its proportion. To him and to his associates the people of this State owe their thanks for the successful stocking of our watercourses and bays with shad, catfish, carp, black bass, striped bass, whitefish, etc.

We most earnestly hope that, in the coming years, we may be favored by the United States Fish Commission with a supply of the different varieties of eastern fish.

VIOLATIONS OF LAWS.

The fish laws have been violated to a great extent on the upper rivers, by unprincipled men, who have established fisheries from Fremont to Redding, on the Sacramento River. The great damage that has been done by these up-river fishermen has been occasioned by the continued drawing of seines upon the gravel bars, not only in the taking of the fish ready to deposit spawn, but also in destroying the ova already deposited upon the gravel bars, these bars being the natural spawning grounds of the salmon. In the opinion of the Commissioners, the State should set apart that section of the river from Jacinto to the McCloud and Pit Rivers as breeding grounds, so that no net or seine could be legally used in that portion of the river. If a law of that character is not passed and enforced, the salmon interest of this State will be of short duration, as the parties using seines on the spawning grounds do more towards annihilating the salmon than all the gill-net fishermen, as the gill nets are nearly of a uniform size of mesh, and only take matured fish, while the seines take all sizes, from one half pound up.

In the opinion of the Commission, it would be wise for the Legislature to enact such laws as will control excessive and prohibit destructive modes of fishing, such as Chinese bag nets, Chinese trout lines, etc., as they are destructive to the young of all kinds of fish.

The Commission would advise that a law be passed to prohibit the use of any weir, pound, bag net, China trout line, set nets, and all other contrivances, in the public waters of this State, with the exception of the fyke nets, and providing that the wings thereof do not extend more than twenty-five feet in the stream from the bank or shore; also, to enact such laws as will prohibit the Indians from taking any kind of fish by any other method than was in use by them prior to 1850.

SHELBY HATCHERY.

The hatching of trout at the Shelby hatchery was started in the month of May, 1883, and during the year there were hatched and distributed over 95,000 trout, and, although this hatchery was started very late in the season for trout hatching, it establishes the fact that the conditions and surroundings are very favorable to the business.

The hatching house was, in 1883, under the charge of Mr. Richardson, a gentleman well versed in the art of propagating fish artificially. Under his management, in the space of two months, over 95,000 were hatched of the species as follows: McCloud River, Lake Bigler, Donner Lake, and Modoc or rainbow trout. After the appointment of the majority of the present Commission they examined into and took charge of the property belonging to the State, which consisted of an old building called a hatchery, situated about one mile from the railroad in Alameda County, near Chabot Lake; some transporting cans, and a few hatching boxes which were not worth moving. As soon as we could conveniently get to work, the Commission found a suitable place for a temporary hatchery, which is situated on what is called Butterfly Creek, between Colfax and Grass Valley, on the Nevada Narrow Gauge Railroad. The Commission received the privilege of building a hatchery house, with the use of a bountiful supply of water, from the owner of the property, Joseph Shelby, Esq.

SACRAMENTO RIVER.

The Sacramento River, which heads in the northern part of the State, runs nearly north and south through four degrees of latitude, and is one of the best salmon streams in the world. At the head the water is clear and icy cold, and the river has a fine gravelly bottom, making fine spawning grounds.

The principal tributaries are the Pit River, which rises in Siskiyou County in Goose Lake, and the McCloud River, which is one of the finest streams in the State of California, and widely noted as a trout stream. Here the United States Commission built their hatchery. The water is very cold, more so than any other stream in the State.

The Feather River is another branch, and in early years was a very good salmon stream, but of late years the salmon have not ascended on account of the impure water.

M'CLOUD RIVER.

The United States hatchery on the McCloud River has been a great benefit to the State of California in years past, on account of the large number of salmon which have been planted and obtained from it in the headwaters of the Sacramento River. The abandonment of the hatchery and of the propagation of fish by the United States Commission, leaves the State of California without any hope of depositing any salmon fry in any of our streams this year (1884). It is to be hoped that our next Legislature will make an appropriation that will enable us to establish a hatchery, in the year 1885, on one of the branches of the Sacramento River. As our interest in the packing of salmon is very great, it occurs to us that the State should make liberal provision in the direction mentioned. The United States hatchery,

on the McCloud River, has been virtually given up, and we can expect no further salmon supply in that direction. Unless the Legislature make an ample appropriation for the erection of a State salmon hatchery, the decrease of salmon will annually continue, and in a short time we will neither have the salmon for a food, nor the canneries as an industry, and the fisherman vocation will pass away.

FISH-WAYS, OR LADDERS.

Not many arrests, up to the present time, have been made for the violation of the law by dam owners, in failing to establish ways and ladders.

The dams on the headwaters of the Stanislaus, Tuolumne, San Joaquin, and the upper Sacramento Rivers, are, in our opinion, a great drawback to the salmon interest, as the spawning grounds are, for the most part, above the dams. There being no fishways at the dams, the fish deposit their ova farther down the rivers, where fishermen are using nets, and thereby disturbing the ova and killing every egg that would otherwise mature. The failure to erect proper fish ladders was one of the causes of the decrease of salmon in the year 1884.

APPEAL TO THE LEGISLATURE.

The California Commission call upon the next Legislature to make appropriations for two hatcheries—one for the purpose of hatching trout and keeping the same in proper ponds until they become at least four months old, and a hatchery for the breeding of salmon on the headwaters of the Sacramento River. Without these hatcheries the Commission will be unable to keep up the supply. The demand now exceeds the supply by more than 100,000 matured salmon. The California Commissioners have been dependent upon the United States Commission for all salmon supplies, and we can no longer look for fish in that direction. Because the California salmon do not thrive well in Atlantic waters is the reason why the United States Commissioners have discontinued their work at the McCloud River hatchery.

AMERICAN RIVER.

This branch of the Sacramento River is nearly depleted of all kinds of fish, although most of the small streams which empty into it are well supplied with small brook trout. The same can be said of the Feather and Yuba Rivers. The great cause of depletion is owing to the fact that gold mining has been carried on upon those streams from the first discovery of gold to the present time, causing the water to be heavily charged with debris.

It is the opinion of the Commission that the accumulations of sand, etc., from the mines work great destruction to the ova by covering it with deposit, and also forcing the fish that would naturally breed in these waters to seek other streams where the water is purer.

SAN JOAQUIN RIVER.

This is a very good stream for the Fall run of salmon, the ascent being not very steep, and the current, especially the first seventy-five miles, not being very strong. The different branches form fine spawn-

ing grounds, provided the fish could reach their headwaters. The only stream emptying into the San Joaquin not dammed is the Mokelumne. The Tuolumne and Stanislaus are dammed in such a way as to prevent the fish from ascending.

BIG MEADOWS.

These meadows lie in Plumas County. They are grand spawning grounds for trout. The north fork of the Feather River runs through the meadows. The river derives its waters from springs, some of which are extensive, causing large streams to flow into the main river, and furnishes, with a large realm of water, one of the finest spawning grounds in the State—one of the best for feeding, spawning, and fish increase. The water is cold at all seasons of the year; the temperature not higher than sixty degrees Fahrenheit. The waters have been diverted from the original watercourse by what is known as the Watt cut, which, at certain times of the year, leaves insufficient water for fish to ascend over the natural falls in the river, causing great complaint from the property holders along the meadows. They have just cause for complaint.

THE M' CLOUD RIVER.

The McCloud River takes its water supply from the Shasta Buttes. The river runs nearly north and south, with little variation, through six or seven townships, and ranks among the finest of our mountain streams. The water is always cold, varying in depth from three to fifteen feet. It is also a most excellent trout stream, the rainbow and Dolly Varden trout being caught in its waters in great numbers, and weighing from one half pound to eight and ten pounds each.

Salmon also ascend the McCloud in great numbers for the purpose of spawning during the season. At this time of the year it is a known fact that they will readily take the hook, a fact not known to exist in any other river in our State.

The tributary of the Little Sacramento, called Dog Creek, is well stocked with trout that weigh from one half pound to three pounds.

Mosquito Creek is well stocked.

Little Mosquito and Portage Creeks are well stocked with California brook trout, and of average weight with those found in the small streams that empty into the Sacramento, Pit, and McCloud Rivers, making that section of our State one of the best trout fishing localities found in our own State or the United States, as also furnishing the best spawning grounds in the world considering the area.

The different branches of Pit River are as follows:

Hat Creek is well supplied with the rainbow trout, which average from one half pound to four pounds above the falls, and weighing from one half pound to eight pounds below the falls.

Hatchet Creek also abounds with small brook trout.

Bennie Creek, above the falls, is also well filled with large brook trout, pulling the scale at one and one half pounds.

Fall River is also well supplied with the black trout and native whitefish. The latter fish do not resemble the eastern whitefish. In fact all the streams that empty their waters into Pit and McCloud Rivers are all good trout streams and well stocked.

The streams on the eastern divide of the State are not so prolific with trout, although some few are well stocked. The lakes are well supplied. The only streams which appear to have become materially exhausted, are our coast streams in and around San Francisco. This, no doubt, is owing to the large population that indulge in the pastime of angling. There has been a scarcity of food for the trout to feed upon in the upper rivers, but the fish have done better during the last few months. This may have been caused by the continued blasting on the northern railroad in the vicinity of their feeding and spawning grounds.

In our opinion, the McCloud River trout are migratory, and are called on the lower rivers, salmon trout.

CLOSE SEASON.

On the first day of August, 1883, the Commission placed a patrol upon the Sacramento River and adjacent bays, under the direction of W. C. Jones, as Deputy Commissioner. The arrangements for the patrol were completed by the ninth of the month, when the first sortie was made and several parties were arrested for illicit fishing. From the ninth of August, the patrol was kept in the field. In fact, the pirates and violators of the law seemed to forget that there ever was a law passed for the protection of salmon. It was a hard matter to make them believe that the Commissioners were in earnest. Deputy Commissioner Jones at times was compelled to resort to force in order to prevent parties from further violating the laws. In the opinion of the State Commission, Mr. Jones has succeeded, by his energy and intrepidity, in stopping almost all of the lawless and wanton destruction of salmon, especially during the close season of 1883.

During the close season of 1884, viz.: the month of August, there was but little illicit fishing done, except in the last few days of the month, when a few boats ventured out, and those were captured by our deputy, W. C. Jones.

One of the greatest drawbacks to successful work is, the want of a proper conveyance to patrol the rivers, and at all times; sailboats are not always successful in making captures, on account of the fishermen having fast crafts of their own, and, as soon as the Commission's boat is discovered, they escape. This is owing to the fact that the most of their boats are superior sailers. The Commissioners need a good steam launch, with a light draft of water, having speed sufficient to overtake and bring the violators to justice.

REPORT OF DEPUTY FISH COMMISSIONER W. C. JONES.

We herewith submit the report of Deputy Fish Commissioner W. C. Jones:

BIRD'S LANDING, January 1, 1884.

To the honorable Board of Fish Commissioners of the State of California:

GENTLEMEN: In compliance with your request, I hereby submit my report from August 1, 1883, to January 1, 1884.

On the first of August, 1883, I received a deputy commission authorizing me to patrol the Sacramento River, the San Joaquin River, and Suisun Bay.

Up to the ninth of August I succeeded in locating several tanks and salt-houses, where active preparations were being made for the purpose of salting fish during the close season. Up to the ninth, no arrests had been made. On that day, in attempting to arrest two Greeks in Three-mile Slough, one of them, named A. Nicholas, was killed; the other, John Peterson, was arrested. Nothing more occurred until the fourteenth, when two nets were captured near Chinatown, the owners escaping. On the sixteenth, a raid was planned, using the steam tug Belshaw, owned by Captain Nelson & Co., of the Benicia cannery, and up to the twentieth, we captured thirteen hundred salted salmon and three tanks. In this raid, no owners appeared. On the twenty-first, five men were taken, and on the twenty-second four more, for violating the fish laws; on the twenty-seventh two more, and on the night of the thirtieth sixteen men, making a total for the month of August of thirty-nine individuals. During the month of September nothing of interest occurred.

By directions of your Board a raid was planned to overhaul the Chinese fishermen in San Pablo and San Francisco Bays, and during the ten days following, we captured forty-three Chinamen who were using set-nets. On the twenty-ninth two Greeks were captured near Collinsville, violating the Sunday law. November second, took in four Chinamen with nets set across Cache Slough, and on the eighth four more, for the same offense; making a total number of prisoners up to the eighth of November, inclusive, eighty-two. Of the white fishermen there were thirty-one. Their nationalities are as follows:

Greeks	14
Italians	10
Portuguese	4
Austrians	2
Germans	1

The whole number were convicted, thirteen paying fines of \$50 each; the remainder serving out their sentence in jail. Of the Chinamen, fifty-one in number, eighteen were convicted; fifteen were tried at Martinez by jury and released, and five more that were tried at San Rafael were freed by jury, ten convicted, and the remainder were not brought to trial. Nothing more occurred until January 15, 1884, when, by direction of your honorable Board, I descended the Sacramento River to inspect nets. Found two at Courtland, one at

Emmaton, one at Collinsville, below the legal size in length of mesh. The owners were all arrested. The one at Emmaton pleaded guilty and was fined \$50 on the twenty-ninth of January.

On the sixteenth of January found two nets below legal size at Courtland. One of the parties pleaded guilty, and on the eighth day of February was fined \$50.

COLLINSVILLE, October 20, 1884.

To the honorable the Board of Fish Commissioners :

GENTLEMEN: In compliance with your request, I hereby submit the following report from January 1 to October 23, 1884, inclusive. I have captured the following, viz.:

January 15 to 25—Fourteen Greeks and Italians, charged with stealing a house located on the lower end of Grizzly Island, on or near the north boundary of Suisun Bay. All of the above parties were tried in Fairfield, and found guilty of petty larceny, fined \$50 each and costs, aggregating \$80 to each prisoner.

February 10—Took in Harry Beyer, John Seevie; February 15—Frist Hartman, Frank Harmainsons, J. D. Crandell, Frank Robies. Discharged.

February 15—Antone Bruers, tried at Benicia, and fined \$50.

February 15—Alonzo Pisto, tried at Benicia, and fined \$50.

February 25—A. Devoto, tried at Benicia, and fined \$50.

February 25—A. Costo, tried at Benicia, and fined \$50.

February 25—Santo Lucee, tried at Benicia, and fined \$50.

February 25—Christ. Manuel. Sent to jail.

March 15—Peter Bumbus. Sent to jail.

March 15—George Manuel. Sent to jail.

March 12—Peter Dago. Sent to jail.

March 12—John Nacht. Sent to jail.

March 19—Costa Stratto. Sent to jail.

March 19—A. Theodros. Sent to jail.

April 17—Tom Lee. Sent to jail.

April 17—Ah Chung. Sent to jail.

April 17—Ah Gon. Sent to jail.

April 17—Ah Shone. Sent to jail.

April 19—Peter Tom. Fined \$50.

April 19—A. Constantine. Fined \$50.

May 5—George Brown. Fined \$50.

May 5—John Smith. Fined \$50.

May 5—Demetry Bobi. Fined \$50.

May 5—John Brown. Fined \$50.

May 5—Demetro Lawrence. Fined \$50.

May 5—Nicholas Bruce. Fined \$50.

May 5—John Mimecha. Fined \$50.

May 5—John Andrews. Fined \$50.

May 5—George Brown. Fined \$50.

May 11—Chas. Kesling. Fined \$50.

May 11—Thos. Roberts. Fined \$50.

May 11—John Lunes. Fined \$50.

May 11—George Journess. Fined \$50.

May 19—John Golitto. Jail fifty days.

May 19—Joseph Pogee. Jail fifty days.

June 7—Nicholas Barra. Fined \$50.

June 7—Constine Janullo. Fined \$50.

June 7—Josey McCorea. Fined \$50.

June 7—Alex. Peters. Fined \$50.

June 7—Alex. Rozario. Fined \$50.

June 9—John Constine. Fined \$50.

June 9—Pappello Sofico. Fined \$50.

June 9—Christ. Sprego. Fined \$50.

June 9—George Allec. Fined \$50.

June 9—John Nicholas. Fined \$50.

June 16—Nicholas Christ. Fined \$50.

June 16—Nicholas Columbus. Fined \$50.

August 15—Joseph Largomorisina, Antone Petro, Manuel Gappie, Joseph Penio, Manuel Tarkenka. Held for stealing a cow from Walter Storey of Chipp's Island. Case set for November 15, 1884.

August 29—John Starbo. Fined \$50.
 August 29—Manuel Dorris. Fined \$50.
 August 29—Henry Richardson, A. Mastillo, Peter Holker. Jailed.
 August 29—John Bell. Fined \$50.
 August 29—Niel Nelson. Fined \$50.
 August 29—Chas. Summon, Andrew Faruseth, Martin Busion. Not guilty by jurors.
 September 16—Antone Bragell. Fined \$50.
 September 16—A. Andrews. Fined \$50.
 September 16—F. Bayo, A. Bosco. Jailed.
 September 25—John Spodd. Fined \$50.
 September 25—M. Calighan. Fined \$50.
 September 30—Romaro Francisco, Frank Rittie. Jailed.
 October 4—Ah Shun, Gom Lee, Tom Tough, Ah True. Jailed.

Total amount collected for fines, \$2,000.

The foregoing report does not include some forty arrests that I made during the fourteen months that I have been under the employment of the Fish Commissioners. By the partiality of the jurors, and in some cases not having sufficient evidence to convict, many of the violators escaped justice.

The best evidence that I have to offer in the interest of the good accomplished by the river patrol, is the small amount of violations now being committed of the existing fish laws. It is a well known fact that previous to the establishment of an efficient patrol on the rivers and bays, fishermen carried on their unlawful business without restraint.

The following is the number of convicted violators of the law as regards nationality:

Greeks	45
Italians	23
Germans	6
Americans	1
Chinese	18
Total	93

I hereby certify the above report to be correct.

W. C. JONES,
 Deputy Fish Commissioner.

HISTORY OF FISH CULTURE.

1850—French Government appointed a Fish Commission.

1850—Norwegian Parliament voted 3,000 thalers for the culture of fish.

1854—Belgian Government organized a fish-breeding establishment on the same principle as France.

1856—Massachusetts appointed a Fish Commission to inquire and report; the result was, that in 1865 the State adopted the present system and granted appropriations.

1857—Russia appointed a Fish Commission; the result of their labor culminating in the establishment in 1862 of a government breeding place in Finland, and by the year 1873 there were ten such in that province.

1860—Russia also subsidized an extensive hatchery at Nicholasky, in the Province of Novgorod.

1865—The State of New Hampshire sent commissioners to Canada for salmon ova. From 1865 to 1870, the State expended some \$23,000 for fish culture.

1865—The Austrian Government founded a fish hatchery at Saltzburg, and in 1873, every province in the empire was provided with its own breeding establishments.

1866—The State of Pennsylvania organized a Fish Commission, but no money was appropriated until the year 1873; but between the years 1873 to 1880 inclusive, the amount given through State aid was, for the purpose of public fish culture, nearly \$100,000.

1866—The State of Connecticut appointed a Fishery Commission, and appropriated for the purpose of public fish culture, from 1868 to 1880, \$44,500.

1866—The Dominion of Canada established a Fishery Commission with a large staff of officers, with ample funds at their command.

1867—The State of Maine appointed a Fish Commission. From 1867 to 1880, appropriations were made to the amount of \$38,000.

1868—The State of New York appointed a Commission of Fisheries, and from 1868 to 1879, expended the sum of \$169,000.

1870—The State of California appointed a Commission of Fisheries, and from 1870 to 1882, appropriated the sum of about \$40,000.

1870—The State of New Jersey appointed a Fishery Commission, and from 1871 to 1880, the appropriations were about \$30,000.

1870—Rhode Island appointed a Commission for Fish Culture, and from 1871 to 1880, appropriated \$10,000.

1870—Alabama appointed a Fish Commission.

1871—The Congress of the United States of America appointed a Commission of Fish and Fisheries, for all the States of the Union, with a full staff of officers having a knowledge of Fish Culture, and up to 1880, the total sums placed at the disposal of the Commission amounted to about \$488,500.

1871—The American Fish Culturist Association organized, and in 1872 applied to Congress to authorize the United States Commission to undertake the duty of restoring fish to the depleted rivers, and a resolution was passed authorizing the United States Commission to fulfill that duty.

1872—At Bucksport, State of Maine, an extensive breeding place was established at the joint expense of certain States and the United States Commission, under the control of the United States Commission.

1873—The State of Ohio appointed a Fish Commission, and from 1873 to 1880 the sums voted for fish culture amounted to nearly \$29,500.

1873—The State of Wisconsin appointed a Fish Commission, and from 1873 to 1880 the sum voted for fish culture amounted to about \$40,000.

1874—The State of Iowa appointed a Fish Commission, and from 1874 up to 1880 money was appropriated for the artificial culture of fish amounting to \$23,500.

1875—The New York Commission succeeded in hatching sturgeon, and were very successful.

1875—The State of Minnesota appointed a Fish Commission, and from 1875 to 1880, sums were appropriated amounting to \$23,000.

1876—The State of Kentucky appointed a Commission of Fisheries, and from 1876 to 1880 the various sums appropriated for fish culture were, in total, \$11,000.

1877—The State of Kansas appointed a Fish Commission, and from 1877 to 1880 appropriated for fish culture the sum of \$2,500.

1877—Germany and the United States were successful in the artificial hatching of herring.

1877—United States successfully introduced three species of carp from Germany.

1877—United States Congress established a Government carp pond by special appropriation, from which pond several hundred thousand carp have been distributed to all parts of the United States.

1877—The State of Colorado established a Fishery Commission, and from 1877 to 1880 appropriated for fish culture the sum of \$2,000.

1877—The State of Nevada appointed a Fish Commission, and from 1877 to 1880 the sum of \$2,500 was appropriated.

1877—West Virginia appointed a Commission of Fisheries, and from 1877 to 1880 there was appropriated for fish culture about \$4,000.

1877—There was one salmon caught in the Delaware River, and in 1878 there were several hundred taken.

1876—Salmon were planted in the Connecticut River, and in 1878 the fishermen caught more than six hundred.

1878—Sole were introduced by the United States Commission into the United States.

1878—Codfish were successfully hatched on the coast of Massachusetts by the United States Commission of Fisheries.

1879—Haddock were successfully hatched, in large numbers, by the United States Commission of Fisheries on the coast of Massachusetts.

1880—The United States Government built and equipped a large steam vessel for the transportation of fish.

1880—Spanish mackerel and other species of European fish were introduced by the United States Commission.

1880—Countries to which prizes were awarded at the Berlin International Exhibition, were as follows:

United States: Six gold medals, one silver, one bronze, and two honorable mentions.

Germany: Three gold, one silver, three bronze, and eleven honorable mentions.

Russia: One gold, one silver, one bronze, and one honorable mention.

Norway: One silver medal.

Sweden: One silver medal.

Austria: One bronze medal.

Switzerland: One bronze medal.

The people of the United States may well feel proud of the awards above mentioned. It shows that the people of the United States are the most progressive, energetic, and in fact the foremost in the art of fish culture. To-day, in such respect, the United States takes the lead of all other countries in the civilized world, and it is to be sincerely hoped that she will continue to maintain the supremacy.

REPORT OF TREASURER.

To the Commission of Fisheries of the State of California:

Appended find your Treasurer's statement and reports of receipts and disbursements from March 3, 1883—at which time the present Board was organized—up to December 3, 1884.

As to receipts, to the extent they have come from State appropriations, in this report will be found, in consecutive order, the number, date, and amount of each of the Controller's warrants.

The accounts covered by these warrants were presented to and approved by the State Board of Examiners, and are now on file in the proper State department.

All other disbursement accounts were paid by bank checks, and, on settlement of the bank account, these paid checks have been returned, and are now on file as vouchers.

Having given to the fish industry of California, personally and as one of the Commissioners, much consideration, I deem it not inappropriate for me, in this report, to present a few suggestions.

In order to protect and increase the fish industry, I suggest that an appropriation of \$3,000 be solicited from the ensuing Legislature, to enable the Fish Commissioners to purchase a swift steam launch, by means of which the Commission and its patrol may successfully pursue, overtake, arrest, and bring to punishment all violators of the fish laws, and to drive the Chinese and other offenders from our bays and rivers.

I further suggest that the State appropriate \$10,000 to be expended by the Board of Fish Commissioners in the establishment and construction of a State salmon hatchery—the hatchery to be erected at an available site on one of the upper tributaries of the Sacramento River. The hatchery should have a hatching capacity of 6,000,000, with ample storage reservoirs for the safety of the young fry, until, by size, they can protect themselves from the devouring large fish. It is reported by the United States Fish Commissioner that from September, 1873, to November, 1882, 18,337,000 young salmon were released from the United States hatchery into the McCloud River, a tributary of the Sacramento. Whilst I have much reason to question the statement

as to numbers, I fully appreciate the obligation of our citizens to the Government of the United States and her Commissioners for a very generous and valuable supply. The General Government having practically, if not positively abandoned all work of supply in the direction mentioned, the State must do it or lose the salmon.

In my judgment this branch of *fish culture* demands immediate and active attention of the Commission and the Legislature.

I further suggest that a "boat license law" be enacted, requiring all persons and parties known as market or cannery fishermen, and those engaged in catching fish to dry, salt, or transport, to pay a license tax upon each boat used by them in their vocation. Such law will have the approval of the law abiding fishermen.

I further suggest that the State appropriate, for the thirty-seventh fiscal year, \$7,000, and for the thirty-eighth fiscal year, \$6,000, and that a special appropriation of about \$1,000 be made to cover the deficiencies of the thirty-fifth and thirty-sixth fiscal years.

Submitted.

A. B. DIBBLE,
Commissioner and Treasurer.

MISCELLANEOUS RECEIPTS AND DISBURSEMENTS.

Date.		Amount.
1883.	<i>Receipts.</i>	
March 3-----	Cash received from former Commission, deposited with Anglo-Californian Bank-----	\$6,504 11
March 3-----	Cash from estate of Traylor-----	21 28
June 26-----	Cash returned by J. D. Redding-----	97 40
November 9-----	Cash returned by J. D. Redding-----	55 00
1884.		
February 19 ---	Cash from Sacramento River Packing Company-----	200 00
		\$6,877 79
1883.	<i>Disbursements.</i>	
March 5-----	Paid J. G. Woodbury, labor account-----	\$230 25
March 10-----	Paid Francis & Valentine, printing annual report and express'ge-----	54 25
March 12-----	Paid Wells, Fargo & Co., freight on eggs from East-----	60 00
March 15-----	Paid Livingstone Stone, 4,000,000 salmon eggs-----	2,000 00
March 24-----	Paid J. G. Woodbury, salary and expenses-----	44 00
April 2-----	Paid R. H. Buckingham, expense account-----	10 00
April 10-----	Paid R. E. Wilson, counsel fee-----	100 00
April 18-----	Paid John Sissengood, balance labor account-----	15 00
April 25-----	Paid Wells, Fargo & Co., expressage-----	4 45
May 5-----	Paid J. D. Redding, expense account-----	40 00
June 9-----	Paid R. H. Buckingham, expense account-----	130 00
June 9-----	Paid A. B. Dibble, expense account-----	50 00
June 9-----	Paid J. D. Redding, expense account-----	125 00
July 4-----	Paid J. A. Richardson, salary and expense account-----	100 00
July 12-----	Paid Weisbien Bros., fish eggs-----	24 00
July 13-----	Paid J. G. Woodbury, expense account-----	18 00
August 14-----	Paid R. H. Buckingham, enforcing Section 634 Civil Code-----	500 00
July 19-----	Paid Peter Johnston, merchandise for hatchery-----	173 23
August 14-----	Paid J. D. Redding, expense account-----	40 00
August 8-----	Paid Mohawk Lumber Company, lumber-----	49 33
August 17-----	Paid J. A. Richardson, salary and expenses-----	100 00
August 18-----	Paid California Wire Works, wire-----	14 75
August 18-----	Paid J. D. Redding, expense account-----	210 00
August 20-----	Paid A. C. Lowell & Co., merchandise-----	20 00
	Amount carried forward-----	\$4,112 26

MISCELLANEOUS RECEIPTS AND DISBURSEMENTS—Continued.

Date.		Amount.
	Amount brought forward	\$4,112 26
August 31	Paid R. H. Buckingham, expense account	189 30
September 5	Paid Samuel Granger (for J. A. Richardson), labor account.....	50 00
September 10	Paid James Dobbins, for services and labor on river.....	539 50
September 10	Paid W. C. Jones, for services and labor on river	530 00
September 12	Paid J. A. Richardson, for services and labor on river.....	300 00
September 22	Paid A. B. Dibble, cash advanced and expenses.....	384 50
September 28	Paid H. S. Crocker & Co., printing	6 00
September 29	Paid R. H. Buckingham, expense account and Chinese prosecution, etc.....	250 00
October 10.....	Paid R. H. Buckingham, expense account and Chinese prosecution, etc.....	100 00
October 15.....	To Huntington, Hopkins & Co., merchandise.....	9 93
November 20	To H. Woodson, trout eggs.....	20 25
November 20	To A. B. Dibble, expense account	12 37
December 24.....	To A. R. Hamlin, labor account.....	90 00
December 31.....	To Wells, Fargo & Co., expressage.....	3 40
December 31.....	To discount on State warrant.....	18 76
1884.		
February 19	Paid C. H. Rogers, boat and service (Sacramento River Packing Company).....	75 00
.....	Paid June, October, and December, 1884, discount on State warrants.....	53 27
.....	Paid, July, 1884, Wells, Fargo & Co., expressage.....	1 55
.....	Paid Mohawk Lumber Company, on bill omitted by error in claim No. 5.....	12 75
		\$6,758 84
	Balance unexpended.....	118 95
		\$6,877 79

SUMMARY OF EXPENDITURES OF APPROPRIATION FOR THIRTY-FIFTH FISCAL YEAR.

	To appropriation.....		\$5,000 00
1883—October 29	1. By warrant No. 1,952.....	\$1,250 28	
December 21	2. By warrant No. 2,971.....	1,568 35	
1884—February	3. By warrant No. 3,969.....	552 00	
March 4	4. By warrant No. 4,334.....	180 00	
May 21.....	5. By warrant No. 6,835.....	763 70	
June 28	6. By warrant No. 7,136.....	544 20	
August 16.....	7. By warrant No. 536.....	* 141 47	
			\$5,000 00

* This is the amount paid of the claim for \$896 45—see below.

CONDITION OF APPROPRIATION FOR THIRTY-FIFTH FISCAL YEAR.

To claim No. 1—Expenses.....	\$1,250 28
To claim No. 2—Expenses.....	1,568 35
To claim No. 3—Expenses.....	552 00
To claim No. 4—Expenses.....	180 00
To claim No. 5—Expenses.....	763 70
To claim No. 6—Expenses.....	544 20
To claim No. 7—Expenses.....	896 45
	\$5,754 98
By amount drawn as above.....	5,000 00
Deficiency in appropriation to pay claim No. 7	\$754 98

STATEMENT IN DETAIL OF EXPENSES OF APPROPRIATION FOR THIRTY-FIFTH
FISCAL YEAR, BEGINNING JULY 1, 1883, AND ENDING JUNE 30, 1884.

Claim No. 1, August 6, 1883, to October 13, 1883, inclusive.

1. To W. C. Jones, patrol and expense account.....	\$664 65	
2. To R. H. Buckingham, expense account.....	163 38	
3. To Charles Donicke, boat and services.....	50 00	
4. To Carquinez Packing Company, tug service.....	80 00	
5. To S. Marsich, merchandise.....	25 80	
6. To Peter Terrillo, sloop and expenses.....	65 95	
7. To John J. Murphy, services.....	32 00	
8. To J. Grimley, labor on river.....	15 00	
9. To F. M. Angelotti, retaining fee.....	40 00	
10. To John Ferrin, services, cash, etc.....	103 50	
11. To D. Odds and Lot Smith, keepers' fees.....	10 00	
		\$1,250 28

Claim No. 2, September 22, 1883, to November 20, 1883, inclusive.

1. To A. B. Dibble, expense account.....	\$187 40	
2. To R. H. Buckingham, expense account.....	133 60	
3. To W. C. Jones, labor and expenses.....	415 35	
4. To Livingstone Stone, salmon eggs.....	600 00	
5. To W. J. Hugh, board, etc.....	13 00	
6. To Frederick Buckingham, services.....	76 00	
7. To John Cropper, services.....	69 50	
8. To sloop Bessie, Captain Ferrella.....	73 50	
		1,568 35

Claim No. 3, November 11, 1883, to January 31, 1884, inclusive.

1. To J. N. Gill (W. C. Jones), merchandise.....	\$12 85	
2. To F. M. Angelotti, legal services.....	20 00	
3. To John Cropper, services.....	25 00	
4. To Jacob Cantrell, services.....	30 00	
5. To Charles Dagnol, services and boat.....	45 00	
6. To Wm. T. Wallace, Jr., legal services.....	80 00	
7. To R. H. Buckingham, expense account.....	102 15	
8. To D. H. Burton, labor, etc.....	110 00	
9. To W. C. Jones, labor and expenses.....	127 00	

Claim No. 4, February —, 1884.

To A. B. Dibble, expense account.....	\$180 00	
		180 00

Claim No. 5, January 8, 1884, to April 17, 1884, inclusive.

1. To J. D. Johnson, labor.....	\$18 00	
2. To W. C. Jones, services and expenses.....	113 50	
3. To Eureka Lumber Company, lumber.....	40 71	
4. To Peter Johnson, hardware.....	109 49	
5. To J. Shebley, services, etc.....	48 50	
6. To J. C. Frazier, one month's salary.....	100 00	
7. To J. Shebley, fish, expenses, and labor.....	95 55	
8. To R. H. Buckingham, expenses.....	118 40	
9. To J. C. Frazier, salary, expenses, etc.....	116 90	
10. To Mohawk Lumber Company, lumber.....	2 65	
		763 70

Claim No. 6, February 10 to May 9, 1884, inclusive.

1. To R. H. Buckingham, expense account.....	\$83 05	
2. To A. B. Dibble, expense account.....	333 85	
3. To J. C. Frazier, salary, expenses, etc.....	127 30	
		544 20

Claim No. 7, July 23 to December 11, 1884, *inclusivc.*

1. To Lenni Fish Company, fish.....	\$125 00
2. To J. A. Richardson, salary and expenses.....	328 50
3. To H. Woodson, 25,000 trout.....	200 00
4. To W. C. Jones, sloop and services.....	90 00
5. To J. C. Frazier, salary, expenses, etc.....	107 95
6. To John Healey, boat and services.....	45 00
	896 45
Apportioned all that was received from the warrant.....	141 47
	\$5,000 00

NOTE.—Claim No. 7 allowed, \$896 45; balance in appropriation, \$141 47; deficiency, \$754 98.

EXPENDITURES FOR THIRTY-SIXTH FISCAL YEAR, ENDING JUNE 30, 1885.

To appropriation.....		\$5,000 00
<i>By expenditures, Claim No. 1, Warrant 537, July 6 to July 13, 1884, inclusive.</i>		
1. To J. C. Frazier, salary and expenses.....	\$178 30	
2. To W. C. Jones, salary and expenses.....	40 00	
3. To W. C. Jones, sloop and services.....	200 00	
4. To J. C. Frazier, expenses, Lake Tahoe.....	16 50	
	\$434 80	
<i>Claim No. 2, Warrant 1,839, from July 1, 1884, to August 11, 1884, inclusive.</i>		
1. To J. Shebley, cash and labor.....	\$168 10	
2. To Bosqui, engraving and printing.....	25 00	
3. To W. C. Jones, salary and expenses.....	600 00	
4. To R. H. Buckingham, expense account.....	154 65	
	947 75	
<i>Claim No. 3, Warrant 3,088, December 2, 1884.</i>		
1. To J. C. Frazier, services and expenses.....	\$247 95	
2. To W. C. Jones, services and expenses.....	160 00	
3. To R. H. Buckingham, expense account.....	98 35	
	506 30	
4. To A. B. Dibble, expense account.....	365 04	
	2,253 89	
Balance unexpended.....		\$2,746 11

RECAPITULATION.

Receipts.

Miscellaneous.....	\$6,877 79
Appropriation thirty-fifth fiscal year.....	5,000 00
Appropriation thirty-sixth fiscal year.....	2,253 89
	\$14,131 68

Disbursements.

Miscellaneous.....	\$6,758 84
Thirty-fifth fiscal year.....	5,000 00
Thirty-sixth fiscal year.....	2,253 89
	14,012 73
Balance unexpended.....	\$118 95

DISTRIBUTION OF FISH, 1883.

- 5,000 trout in Butterfly Creek, above reservoir, Nevada County.
 33,000 trout in the upper waters American River.
 15,000 trout in Webber Lake.
 5,000 trout in Butterfly Creek, below reservoir.
 8,000 trout in San Bernardino County.
 300 carp in Yolo County.
 29,000 trout in Donner, Webber, and Independence Lakes.

DISTRIBUTION OF FISH, 1884.

25,000 trout in Sonoma Creek.
 30,000 trout in Modoc County streams.
 5,000 land-locked salmon in Independence Lake.
 10,000 land-locked salmon in Donner Lake.
 10,000 land-locked salmon in Bigler Lake.
 2,000 trout at Folsom.
 500 catfish at Fresno.
 10,000 trout in Bear River, Placer County.
 20,000 trout in South Yuba River.
 10,000 trout in American River.
 2,000 trout in stream at Nevada City.
 5,000 trout at Steep Hollow.
 10,000 trout in streams of Santa Clara County.
 10,000 trout in streams of Santa Cruz County.
 70,000 trout on hand for distribution at Shebley.
 600,000 salmon in Sacramento River.
 100,000 salmon-trout (eastern), now being hatched at Shebley.
 300 land-locked salmon in Butterfly Creek and above reservoir.

LIST OF FISH COMMISSIONERS.

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Prof. Spencer F. Baird Washington, D. C.

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 Hon. Charles S. G. Doster Prattville

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Hon. J. J. Gosper Prescott
 Hon. Richard Rule Tombstone
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ARKANSAS.

J. E. Reardon Little Rock
 J. H. Hornibrook Little Rock
 H. H. Rottaken Little Rock

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 A. B. Dibble, Secretary and Treasurer Grass Valley
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Wilson E. Sisty Idaho Springs

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Enoch Moore, Jr. Wilmington

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 S. P. Bartlett Quincy
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Calvin Fletcher Spencer, Owen County

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G. W. Delewader Oakland
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MICHIGAN.

Dr. J. C. Parker, President Grand Rapids
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 Second District—William W. Sweeney, M.D. Red Wing
 Third District—R. Ormsby Sweeney, President St. Paul

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 J. G. W. Steedman, Chairman 2803 Pine Street, St. Louis
 J. S. Logan St. Joseph

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 W. L. May Fremont
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 John F. Antisdell Milwaukee
 Mark Douglas Melrose, Jackson County
 C. Hutchinson Beetown, Grant County

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 E. W. Bennett Carbon County
 P. J. Downs Uinta County
 T. W. Quin Sweetwater County

WASHINGTON TERRITORY.

Albert B. Stream North Cove

DOMINION OF CANADA.

W. H. Whitcher, Commissioner Ottawa, Ontario

PROVINCE OF NEW BRUNSWICK.

W. F. Venning, Inspector of Fisheries St. John

PROVINCE OF NOVA SCOTIA.

W. H. Rogers, Inspector Amherst

PROVINCE OF PRINCE EDWARDS ISLAND.

J. H. Duvar, Inspector Alberton

PROVINCE OF BRITISH COLUMBIA.

A. C. Anderson Victoria

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 The Right Hon. the Earl of Breadalbane, Vice-President.
 The Right Hon. the Earl of Dalhousie.
 The Right Hon. Lord Polworth.
 David Milne Home, Esq., of Milne Gordon.

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 The Right Hon. Lord Abinger.
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 J. W. Young, Esq., W. S., Edinburgh.
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 J. A. Harvie Brown, Esq., of Quarter and Shingarton.
 William Menzies, Esq., Secretary of the Edinburgh Angling Club.
 George H. Handasyde, Esq., Edinburgh.
 J. Barker Duncan, W. S., Hon. Secretary, No. 6, Hill Street, Edinburgh.

SALMON CANNERIES OBTAINING FISH FROM THE SACRAMENTO.

Banner Packing Company	San Francisco
Benicia Packing Company	Benicia
Booth & Co. Packing Company	Collinsville
Booth & Co. Packing Company	Chipp's Island
S. Booth & Co. Packing Company	Black Diamond
W. B. Bradford Packing Company	Collinsville
Carquinez Packing Company	Benicia
Chas. Taylor & Co.	Rio Vista
Cutting Packing Company	Martinez
Courtland Packing Company	Courtland
Capital Packing Company	Sacramento
Columbus Packing Company (F. M. & Co.)	San Francisco
Columbus Packing Company	San Francisco
Jones & Anderson	Sacramento
King, Morse & Co.	Black Diamond
Red Cross Packing Company	San Francisco
Robt. Carter & Co.	Rio Vista
Suisun Packing Company	Suisun Bay
Sacramento River	Chipp's Island
Occident and Orient	Smith's River
Pacific Coast	Eel River

The increase since 1879 in the number of outfits for the taking of salmon, and especially in 1883 and 1884, have nearly trebled, the nets and boats increasing from two hundred and twenty to over fifteen hundred. The nets now have an average length of over three hundred fathoms or eighteen hundred feet each.

The cost of running the different canneries varies considerably, owing to various causes, mainly:

First—Capacity.

Second—Structure.

The cost of running the canneries will average about \$50,000 each per annum.

The cost of each net is about on an average of \$200. The nets have to be renewed annually, or sooner, owing to wear and tear and accidents.

The cost of fishermen's boats average \$200 each on the lower end of the river, while the boats on the upper river, being principally skiffs, cost about \$40 each.

CANNERIES ON THE COLUMBIA.

Showing the immense production of food from salmon.

Aberdeen Packing Company, Quilwact, Oregon	27,500 cases
Adair Packing Company, Astoria, Oregon	11,000 cases
Astoria Packing Company, Astoria, Oregon	20,000 cases
Anglo-American Packing Company, Astoria, Oregon	12,500 cases
Bactolet & Co. Packing Company, Astoria, Oregon	24,000 cases
D. Morgan J. R. Packing Company, Astoria, Oregon	
A. Booth & Co. Packing Company, Astoria, Oregon	
Columbia Canning Company, Washington Territory	16,200 cases
Columbia River Packing Company, Astoria, Oregon	
John A. Devlin & Co., Astoria, Oregon	26,000 cases
Eureka Packing Company, Eureka, Washington Territory	20,000 cases
Samuel Elmore Packing Company, Astoria, Oregon	10,000 cases
Fishermen's Packing Company, Astoria, Oregon	17,500 cases
Hapgood & Co. Packing Company, Waterford, Oregon	10,000 cases
Hartshorne & Co. Packing Company, Astoria, Oregon	16,000 cases
R. D. Hume Packing Company, Astoria, Oregon	14,000 cases
William Hume Packing Company, Astoria, Oregon	16,000 cases
William Hume Packing Company, Eagle Cliff, Washington Territory	

I. X. L. Packing Company, Astoria, Oregon.....	8,500 cases
Knappton Packing Company, Knappton, Washington Territory.....	8,500 cases
George T. Meyers & Co., Rainet, Oregon.....	15,000 cases
J. G. Megler Packing Company, Brookfield, Washington Territory.....	20,000 cases
Ocean Packing Company, Bay View, Washington Territory.....	13,000 cases
Oregon Packing Company, Clifton, Oregon.....	
Occident Packing Company, Astoria, Oregon.....	15,000 cases
Union Pacific Packing Company, Astoria, Oregon.....	15,500 cases
Point Adams Packing Company, Astoria, Oregon.....	
Pillar Rock Packing Company, Pillar Rock, Washington Territory.....	12,500 cases
Scandinavian Packing Company, Astoria, Oregon.....	18,500 cases
Sea Side Packing Company, Astoria, Oregon.....	10,800 cases
White Star Packing Company, Astoria, Oregon.....	16,500 cases
Union Packing Company, Astoria, Oregon.....	20,800 cases
West's Co. Packing Company, Hungry Harbor, Oregon.....	16,000 cases
West Coast Packing Company, Astoria, Oregon.....	16,000 cases
Jas. Williams & Co. Paeking Company, Astoria, Oregon.....	8,900 cases
Thomas & Knowles Packing Company, Astoria, Oregon.....	18,000 cases
F. M. Warren & Co., Cascades, Oregon.....	} 10,000 cases
Warren & Co., Cascades, Oregon.....	
Washington Company, Astoria, Oregon.....	14,000 cases
Bath Canning Company, Gardner, Oregon.....	
Gardner Packing Company, Gardner, Oregon.....	
Jas. Williams, Tacoma, Washington Territory.....	
Puget Sound Cannery, Milton, Washington Territory.....	
R. D. Hume, Rogue River, Oregon.....	
Tillamook Packing Company, Hobsonville, Oregon.....	
Washington Packing Company, Grey's Harbor, Oregon.....	

BRITISH COLUMBIA AND ALASKA CANNERIES.

Bahnoral Canning Company, Skeena River.....	
British America Canning Company, Canoe Pass.....	
British Columbia Canning Company, New Westminster.....	
British-American Canning Company, Skeena River.....	
British Union Packing Company, Ladner's Landing, British Columbia.....	
Cape Fox Packing Company, Cape Fox, Alaska.....	
Chilkat Packing Company, Chilkat, Alaska.....	
Cutting Packing Company, Cook's Inlet.....	
Delta Packing Company, Ladner's Landing, British Columbia.....	
Douglas Packing Company, Nass, British Columbia.....	
E. A. Wadhams Packing Company, Excelsior Landing, British Columbia.....	
English & Company Packing Company, New Westminster, British Columbia.....	
Ewen Packing Company, New Westminster, British Columbia.....	
Findley & Company Packing Company, Deas Island, British Columbia.....	
Inverness Packing Company, Inverness, British Columbia.....	
Joseph Spratt Floating Cannery, —, British Columbia.....	
Karluck Floating Cannery, Kodiak Island, Alaska.....	
Laidlaw & Company, Lapperton, British Columbia.....	
Mettakath, Mettakath, British Columbia.....	
Nass River Fishing Company, Nass River, British Columbia.....	
Nimpkish Cannery, Alert Bay, British Columbia.....	
North Pacific Trading Company, Kalawack, Alaska.....	
Richmond Canning Company, North Arm, British Columbia.....	
River Inlet Canning Company, Queen Charlotte Sound, British Columbia.....	
Robert Cunningham Canning Company, Coquitlan, British Columbia.....	
Wachusett Canning Company, Alaska.....	
Wellington Canning Company, Wellington Landing, British Columbia.....	
Windsor Canning Company, Aberdeen, British Columbia.....	
Quashela Packing Company, Skeena River.....	
Wannuck Packing Company, River Inlet.....	

Respectfully submitted.

R. H. BUCKINGHAM,
A. B. DIBBLE,
Fish Commissioners.





