
REPORT
OF THE
COMMISSIONERS OF FISHERIES

OF THE
STATE OF CALIFORNIA,
For the Years 1872 and 1873.

G. H. SPRINGER.....STATE PRINTER.

REPORT.

To His Excellency,
NEWTON BOOTH,
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 this State," approved April second, eighteen hundred and seventy, respectfully submit their second biennial report.



REPORT.

Your Commissioners, in pursuance of the plan contemplated in their last report, proceeded to open correspondence with the most noted fish culturists in the East, and also with the United States Fish Commissioner, at Washington City, upon the subject of obtaining an additional supply of shad, and also a large variety of other food fishes, from the Eastern lakes and sea coast.

By the kindness of the United States Commissioner of Fisheries, the Hon. Spencer F. Baird, we were allowed to avail ourselves of the services of Mr. Livingstone Stone, attached to the United States Commission, and engaged in transferring salmon eggs from California to the waters flowing into the Atlantic. Mr. Stone's high reputation as a successful breeder of fish, as well as a writer upon the subject of pisciculture, not only gave us confidence in the success of the enterprise, but also led us to enlarge and amplify the scope and range of the undertaking.

In this view, we made arrangements with Mr. Stone, for him to proceed to the Eastern States, and there collect a supply of shad, eels, black bass, white fish, tautogs, striped bass, blue fish, and lobsters.

To carry into effect these plans, we chartered from the Central Pacific Railroad Company a special car, to be placed at our disposal at a given point at the East, and there to await the necessary time for being fitted up for the purpose, and to receive its freight of living fish. All the requisite arrangements for the transit of this car over the different lines of roads, as well as for its necessary stoppages and delays at different points where fish were to be taken in, had been most completely made by our colleague, Mr. B. B. Redding, through the agency of the different railroad managers; and, on the seventeenth day of March, eighteen hundred and seventy three, Mr. Stone left San Francisco, to carry out, if possible, the plan of your Commissioners, to transport a carload of living fish from the Atlantic to the Pacific Ocean.

Referring to this expedition, Mr. Stone says:

"In accordance with instructions received from the Fish Commissioners of the State of California, I left San Francisco for the Eastern coast, on the seventeenth day of March, eighteen hundred and seventy-three, for the purpose of procuring a stock of the best varieties of Eastern fish, and transporting them, alive, across the continent, with a view to introducing these varieties into the public waters of California.

"My plan of operations for the whole undertaking was: First—To collect the fish at some favorable point at the East, where they could be kept alive until everything was ready for the journey. Second—To fit up a car with the apparatus most suitable for transporting living fish; and, third—To take this car, when loaded, to California, in the least possible time, and without any transfer of its contents. This plan was successfully carried into practice, up to the time of the accident just beyond Omaha.

"The first installment of living fish intended for the California car, arrived at Charlestown, New Hampshire—the point of rendezvous—on the seventh of May. It consisted of eighty-two black bass (*grystes fasciatus*), glass-eyed perch (*lucio perca*), and bullheads (*pimelodus*), and about three hundred thousand eggs of the *perca flavescens* and the *lucio perca*.

"These fish were collected at Lake Champlain, and at the Missisquoi River, in Vermont, and were taken a journey of thirty hours, by rail, before reaching Charlestown. They, nevertheless, bore their trip admirably, and arrived at their destination in first-rate order.

"The next two weeks were spent in fitting up the car, which had arrived at Charlestown, New Hampshire, and making other preparations for the difficult undertaking in prospect. Arrangements had been previously made, at the suggestion of the Hon. Spencer F. Baird, United States Commissioner of Fisheries, with Mr. Myron Green, at Castleton, on the Hudson, for a supply of young shad and fresh water eels; and, also, with Captain Orinal Edwards, of Woods Hole, Massachusetts, for young lobsters, and other salt water fish. The Eastern trout (*salmo fontinalis*), were to be taken from the Cold Spring Trout Ponds, at Charlestown. The large lobsters were to come from Johnson & Loring's establishment, at Boston, and Mr. Myron Green was dispatched to the Raritan River for catfish.

"The equipment of the car having been completed, and everything being ready, the third day of June, eighteen hundred and seventy-three, was set for our departure. At midnight of June second, Mr. W. S. Perrin arrived from Boston with a special car, having on board the lobsters, oysters, small lobsters, salt water eels, tautogs, and reserves of ocean water. We began at daylight the next morning filling the tanks in the car and loading in the fish, and by one o'clock in the afternoon everything was ready, and at a quarter past two, on Tuesday, June third, the California Aquarium Car started on its journey.

"The car was furnished by the Central Pacific Railroad Company, and was one of their fruit cars, intended for quick trips across the continent. It was twenty-seven feet long and eight feet wide, and was provided with a Westinghouse air brake and Miller platform, which enabled us to take it along with passenger trains.

"At one end of the car was a stationary tank, built of two-inch plank, lined with zinc, and occupying the whole width of the car, and eight feet of its length.

"This tank was two feet and eight inches deep, and held, when full, about ten thousand pounds of water.

"At the other end of the car was a large ice box, the reserves of sea water, six large cases of lobsters, and a barrel of oysters.

"In the center of the car, and occupying nearly all the room in it, were the other portable tanks for carrying the fish. Our beds were on the top of the large stationary tank, which, of course, was covered. The large tank was also arranged so that we could take on water on a

large scale from the waterworks at the railroad stations en route. This proved to be a very great convenience, and was, in fact, indispensable.

"When we left Charlestown, New Hampshire, the car contained upwards of:

"Sixty black bass from Lake Champlain (*grystes fasciatus*).

"Eleven glass-eyed perch from Lake Champlain (*lucio perca*).

"One hundred and ten yellow perch from Missisquoi River (*perca flavescens*).

"Eighty young yellow perch from Missisquoi River (*perca flavescens*).

"Twelve bullheads (horn pouts), from Missisquoi River (*pimelodus*).

"One hundred and ten catfish from Raritan River (*pimelodus*).

"Twenty tautogs from near Martha's Vineyard (*tautoga Americana*).

"One thousand five hundred salt water eels from Martha's Vineyard (*anguilla*).

"One thousand young trout from Charlestown, New Hampshire (*salmo fontinalis*).

"One hundred and sixty-two lobsters from Massachusetts Bay and Woods Hole.

"One barrel of oysters from Massachusetts Bay.

"Supplies of minnows for feed fish.

"The black bass, bullheads, catfish, and part of the lobsters, were full grown and heavy with spawn.

"Besides the fish above enumerated, I took on at Albany forty thousand fresh water eels from the Hudson, and arranged for twenty thousand shad and shad eggs (*alosa prastabilis*), from the Hudson, to overtake us at Chicago.

"The receptacles for holding the fish consisted of one large stationary tank, eight feet square and two feet eight inches deep.

"One round wooden seventy-gallon tank.

"One round fifty-gallon tank.

"Three round thirty-gallon tanks.

"Three conical-shaped thirty-gallon tanks.

"Six conical ten-gallon tin cans.

"One conical fifteen-gallon tin can.

"Three round nine-gallon tin cans.

"Two thirty-five-gallon casks.

"Six large cases (containing the lobsters).

"The total capacity of the whole, excluding the lobster cases, being about sixteen thousand pounds of water.

"Besides the vessels for holding the fish, the car contained the following articles:

"One large one hundred and twenty-gallon cask, filled with ocean water.

"One sixty-gallon cask, filled with ocean water.

"One large ice box.

"One half barrel of live moss.

"One half barrel of water plants.

"Curd and meal for feed.

"One bushel of salt for killing parasites.

"The aerating apparatus referred to.

"One alcohol stove.

"One set carpenter's tools.

"Two lanterns.

"Two hammocks.

"Two spring beds.

"Two mattresses and pillows.

"Two sets bedclothes.

"One broom.

"One lot green sod.

"Two thermometers.

"Pipes, spouts, and syphons, for taking in and letting off water.

"One long-handled dip net.

"Two short-handled dip nets.

"Movable steps to door of car.

"Sundry barrels, pails, dippers, etc.

"Maps, with stations marked where we knew the water to be good or bad.

"Our trunks, valises, and private baggage.

"When the car left Charlestown there were four of us in it—Mr. W. T. Perrin, of Grantville, Massachusetts, Mr. Myron Green, of Highgate, Vermont, Mr. Edward Osgood, of Charlestown, New Hampshire, and myself. We arrived at Albany at eleven o'clock and thirty minutes P. M., the same evening, all the fish doing well, and the water in the tanks standing at forty-five degrees Fahrenheit. Here we took on the forty thousand eels mentioned above, and half a ton of ice. We also left Mr. Myron Green here to go to the New York Shad Hatching Works, at Castleton, on the Hudson, and get a supply of young shad.

"On my urgent application to the New York Central Railroad authorities, that road took us with their passenger train, which was due to leave Albany at two o'clock and forty minutes A. M., on the same night. We reached Suspension Bridge about noon, and left for Detroit, with a passenger train, on the Great Western Railroad. We took on ice and water at Hamilton, Canada, and reached the boat at Detroit ferry about eleven o'clock P. M. the same day—Wednesday, June fourth—all the fish being in good order, except the lobsters, which were dying in considerable numbers. The ferry boat being just filled, without the aquarium car, they left us east of the river all night, and it being very warm, I spent the rest of the night till daylight looking up ice, of which I at last obtained about a ton and a half.

"Leaving Detroit that morning—Thursday, June fifth—we proceeded directly to Niles, Michigan, with a passenger train, via the Michigan Central Railroad. We had now come all the way with passenger trains, and had we known this beforehand, we need not have lost any time in bringing on the shad; as it was, however, we expected to make slow time on freight trains from Albany to Chicago, and I here arranged to have the shad brought on by express from Albany, two days after we left that point. These two days we had now on our hands, and it was very aggravating to be obliged to lose so much time when time was so precious. There was no help for it, however, and as I thought it would be better to wait part of the time on the road than to spend the whole of the two days in Chicago, I had the car dropped at Niles, Michigan, and we remained there till six o'clock and ten minutes the next morning—Friday, June sixth—when we went on to Chicago, after taking on ice and water, and catching some minnows to feed the large fish with. We entered Chicago about ten o'clock on Friday morning, all the fish doing well, except the lobsters and eels.

"The temperature at which I aimed to keep the different varieties of fish were as follows:

	Fahrenheit.
Catfish.....	50°
Fresh water eels.....	45° to 50°
Tautogs.....	45°
Salt water eels.....	45°
Black bass.....	42°
Yellow perch.....	42°
Bullheads	42°
Glass-eyed perch.....	42°
Trout.....	38°
Lobsters	34° to 36°
Oysters	34° to 36°

“From the experience which I have now had, however, I would advise a change with some of the fish, which would make the temperature as follows:

	Fahrenheit.
Catfish	50°
Fresh water eels.....	50°
Bullheads	48°
Glass-eyed perch	48°
Yellow perch.....	45° to 48°
Black bass.....	42° to 45°
Salt water eels.....	42° to 45°
Tautogs.....	40°
Trout.....	36° to 38°
Lobsters	34° to 36°
Oysters	34° to 36°

“Mr. Myron Green rejoined us with the shad the next morning—Saturday, June seventh—and at ten o'clock and fifteen minutes A. M. the same day, after having taken on three tons of ice and three tons of Lake Michigan water, we left Chicago for Omaha, via the Chicago and Northwestern Railroad.

“We took on water again at Cedar Rapids, Iowa, and arrived at Omaha at eleven o'clock, on the morning of Sunday, June eighth. Through the courtesy of Mr. C. B. Havens, the train dispatcher of the Union Pacific Railroad, who detailed an engine to take our car to the ice house at the Union Pacific shops, we were enabled to take on a ton and a half of ice, and about one o'clock we started westward again. We were now on our sixth day out, and everything was promising well. All the dead eels had been removed, and we had twenty thousand or thirty thousand left. The mortality of the lobsters was on the decrease,

and we still had over forty alive and in good condition. All the other fish were in splendid order. We had ice and water enough on board to take us, if necessary, to the Sierra Nevada—certainly with what supplies we could get in the Wasatch Mountains, where the water is good. The circumstance of the fish having lived so well up to this time, gave us a good deal of confidence, and we were encouraged to hope that they would continue to do well to the end of their journey.

“After leaving Omaha we stowed away as well as we could the immense amount of ice we had on the car, and having regulated the temperature of all the tanks, and aerated the water all around, we made our tea and were sitting down to dinner, when suddenly there came a terrible crash, and tanks, ice, and everything in the car seemed to strike us in every direction. We were, every one of us, at once wedged in by the heavy weights upon us, so that we could not move or stir. A moment after, the car began to fill rapidly with water, the heavy weights upon us began to loosen, and, in some unaccountable way, we were washed out into the river. Swimming around our car, we climbed up on one end of it, which was still out of water, and looked around to see where we were. We found our car detached from the train, both couplings having parted. The tender was out of sight, and the upper end of our car resting on it. The engine was three fourths under water, and one man in the engine cab crushed to death. Two men were floating down the swift current in a drowning condition, and the balance of the train still stood on the track, with the forward car within a very few inches of the water's edge. The Westinghouse air-brake had saved the train. If we had been without it, the destruction would have been fearful.

“One look was sufficient to show that the contents of the aquarium car were a total loss. No care or labor had been spared in bringing the fish to this point, and now, almost on the verge of success, everything was lost.

“I immediately telegraphed the state of affairs to Mr. S. R. Throckmorton, Chairman of the California Fish Commissioners, and to Honorable Spencer F. Baird, the head of the United States Fish Commission at Washington. I received instructions, by telegraph, the next morning, to return East immediately, with my assistants, and take on a shipment of young shad to California, under the auspices of the United States Fish Commission.

“In pursuance of these instructions, I went East, and having obtained forty thousand young shad from the New York State Hatching Works, at Castleton, on the Hudson, I left Albany a second time, at eleven o'clock and thirty minutes p. m., on the twenty-fifth of June, eighteen hundred and seventy-three, in company with Mr. W. T. Perrin and Mr. Myron Green, my assistants on the aquarium car. We were also accompanied, as far as Omaha, on this trip, by Mr. H. M. Webster, whose experience in carrying live shad was, in this instance, of the greatest value.

“On our arrival at Ogden, Utah, I left five thousand of the shad, in first rate order, in charge of Mr. Rockwood, Superintendent of Fisheries at Salt Lake City, to be introduced into Great Salt Lake, and continued with the other thirty-five thousand to Sacramento, California, where we arrived at half-past one in the afternoon of the second day of July, the fish appearing in every respect as fresh and lively as when they left the Hudson a week before.

“We deposited them that night, at ten minutes past nine o'clock, in the Sacramento River, just above the railroad bridge, at Tehama, the

whole undertaking, from beginning to end, having been a perfect success."

Immediately upon hearing of the loss of the aquarium car, we telegraphed a remittance to Mr. Stone, at Omaha, and directed him to repair at once to the Hudson River, and bring out, while yet in time, all the young shad which his now reduced facilities would permit.

Mr. Stone at once proceeded East, and communicating, by telegram, with Mr. Spencer F. Baird, United States Fish Commissioner, received from him not only prompt attention, but was also furnished by Mr. Baird, for the California Commission, all of the shad which the United States Commission could spare—forty thousand in number—which were immediately sent through to California, at the expense of the United States Fish Commission, under the care of Mr. Stone, free of all charges, for which, and for the many kind and valuable aids extended to us by Mr. Baird, this Commission takes this public opportunity of returning their most grateful thanks.

Upon receiving advice of the approach of this shipment, one of the Commissioners repaired to Sacramento, and there met the incoming car with a fresh supply of water and ice. The little immigrants were found to be all alive and in excellent spirits, and after receiving a fresh supply of ice and water, proceeded on their journey to Tehama, on the Sacramento River, and there, that same night, they were successfully placed in the waters which flow into the Pacific.

In the Spring of eighteen hundred and seventy-two, we opened correspondence with Mr. Seth Green, for an additional supply of shad, but the early Summer and excessive heat of the Eastern States at that time, compelled us to abandon the attempt for the season.

In the meantime, viz., in the Fall of eighteen hundred and seventy-two, we received advice of a shipment, made to us by Mr. Baird, of white fish eggs, and we immediately took measures to hatch them, and place them in the waters of the State.

In view of this, we caused an examination of the different lakes into which they could be placed with the best prospect of success, which resulted in our selecting Clear Lake as affording most of the necessary conditions. Among these conditions is an essential one, namely: that it may be seined without destroying other valuable fish, there being few or no fish in that lake, the destruction of which by seining would be any loss, or which, at any rate, would not be most profitably replaced by the white fish, which can be taken only by seining or trapping. The climate, also, of Clear Lake, seemed to us to be the best within reach, remembering always that the eggs of the white fish are very delicate, and will not bear rough transportation. As it was, in the first attempt all the eggs perished; and in the second effort, although great pains were taken, a very large proportion of the eggs perished on the way.

Having selected what we deemed a proper place, we erected a hatching house, under the charge of Mr. J. G. Woodbury, of whom we take pleasure in speaking as a skillful, careful, intelligent, and economical manager.

Mr. Woodbury conducted the hatching of these eggs with great success, and closed his labors with putting into Clear Lake twenty-five thousand living and healthy young white fish, from which we may reasonably hope to stock all the suitable waters in the State. It may be well to state, that the great object at first is to get the desirable fish here and

acclimated in our waters; after that, they may be bred artificially, and distributed to any extent.

It is probable, or at least possible, that ten thousand shad may return to our waters this coming Spring, and forty thousand more in eighteen hundred and seventy-six. If such should be the case, and they are properly protected by legislation, it will be no difficult or costly matter to breed from them a million of young fish, which, in three years more, will stock the entire coast, and give us shad as plenty as we now have smelts. But, to arrive at this, we require some stronger legislation, which will absolutely prevent the taking for food of the new shad as they come in; we require them all for breeding.

If it shall be the pleasure of the Legislature to continue to aid this Commission, it is our intention, this next coming year, to renew our effort to bring across the continent the food fishes of the East, and with the experience which we have had, and the additional knowledge which we have gained, we have hopes of not only repairing our loss of last year, but largely to improve upon that effort. We regret to say that our loss was large. We had embarked in it all the remaining funds of the Commission; but no human foresight could have predicted it, or guarded against it; and we can only say that it is worth all that it has cost to know the fact that an aquarium of living fish, eels, and lobsters, provided with both fresh and salt water, can be brought from the Atlantic to within one day's travel of the Pacific, in good order and in healthy condition.

Since our last report, the Commissioners have given somewhat of their attention to placing in some of the streams and lakes different kinds of native and other fish, although they have not been able to do so much as they would desire to do were the means at their command. There is no cheap way of doing this work; everything pertaining to it requires dispatch and care. We are handling a delicate and perishable material, under circumstances in which the painstaking and expense of the most careful preparations may, in a moment of neglect or accident, be lost entirely. Consequently, we have refrained from any expensive experiments, and confined ourselves to the introduction of food fishes fully known to be profitable in other States, and the dissemination of such domestic fish as can be easily and cheaply transferred from one part of the State to another. In this way, we have, during the past season, placed some ten thousand Lake Tahoe trout in the South Yuba River. Trout from the mountain lakes have been placed in the North Fork of the American River. We have purchased from the breeders of Tahoe trout, also, six thousand trout, which have been placed in Lake Merced. We have also purchased two thousand Eastern red speckled trout (*salmo fontinalis*), which we placed in the North Fork of the American River, near the Summit. Two thousand of the same, and six thousand Tahoe trout, we have placed in the headwaters of Alameda Creek, and two thousand more Eastern speckled trout in San Andreas Reservoir, near this city.

The Commission feels greatly encouraged in its efforts to preserve and increase the fish of California, by the general interest taken by the people in this very interesting subject. On all occasions we have had the most ready aid, and in many cases gratuitous services from those with whom the operations of the Commissioners have brought them in contact, and we would respectfully suggest that we believe that the people are now willing to incur a moderate expenditure in order to have this work continued. This Commission does not believe that any large

appropriation for this purpose is now necessary. Time is required to develop and perfect the successful propagation and preservation of foreign varieties of fish. We have yet a great deal to learn in regard to this subject, and undue haste and lavish expenditure are by no means the most certain way to success. It is now three years since the first attempt to bring shad across the continent was commenced. We now know that some of the shad brought here in eighteen hundred and seventy-one have lived and grown to good size. The shoal of shad are not due in the rivers of California until June, eighteen hundred and seventy-four, but we have had in our hands three specimens, which are, of course, exceptional, and we have heard of two others. The incoming fish will be breeders, and we shall require funds to enable us to establish breeding stations on the Sacramento and San Joaquin Rivers, and, above all, we require proper laws to preserve this season's arrivals. It will be seen by the accompanying statement that the entire expenditure of the Commission since its last report, has been less than six thousand dollars, and during the existence of the Commission—four years—but seven thousand. With this a great deal has been done, and the foundation laid for the accomplishment of much more.

The work is but commenced, and as we have before remarked, time in this business is a more important element than money. The most in importance is the means for preventing the destruction of the fish we already have. The Commission find it almost impossible to prevail upon the people to refrain from destroying fish in the localities where they abound. It seems as if human invention is taxed to its utmost in the desire for wholesale destruction, and the reluctance which men feel to complain of their neighbors, renders it almost impossible to enforce the laws in such cases. If the Legislature should see fit to make an appropriation sufficient to allow the Commissioners to employ, at times, a proper person to look after such violations of the fish laws and see to their enforcement, we think this evil could readily be suppressed, as the people at large show a great interest in having the law enforced, but no one is willing to make himself obnoxious by being an informer. All this would be cured by placing the means of remedy in the hands of the Commission.

The Commission already have the power to do this, and have done it with most hopeful results, so far as their limited means have allowed. It will be necessary, during this session of the Legislature, to have passed a full and comprehensive law relating to all kinds of fishing. In the first place, the whole system of fish-traps, seines, fykes, etc., should be abolished by law. Secondly, the meshes of the nets used should be regulated by law. The time of fishing for salmon should be properly limited. There come from all parts of the State constant complaints of the destruction of fish by sawdust, and the refuse from sawmills, thrown into the streams; and petitions for the enactment of laws to prevent it are now before the Legislature. This Commission will be aided by many citizens interested in these matters, in passing a law covering the piscatory interests of the State, which we hope will be favorably acted upon by the Legislature. The Commissioners have taken pains to ascertain the season of the year during which the taking of salmon should be prohibited by law. We have caused careful observations to be made of the time at which the salmon ascend to the heads of the rivers to spawn, and from all the information we have been able to obtain in that way, and by consulting with persons well qualified to afford advice from the results of practical knowledge of the subject, we would recommend that

the taking of salmon be prohibited by law from the first of August to the first of November. It should be observed that the having in possession, or offering for sale of salmon, during the close term so prohibited, should be punished the same as the taking of them.

In conclusion, your Commissioners, with much diffidence, would ask the aid of the Legislature for the means of carrying on the work which they feel they have just commenced. There will be necessary, for the coming season, funds to erect hatching houses at such stations as shall have been discovered as the spawning grounds of the shad, now soon to be expected in our waters. The renewal of our effort to bring fish and lobsters across the continent, so nearly successful last year, is an earnest wish of the Commission. Our work at large remains unfinished at the time that we are best qualified to prosecute it. The amount of appropriation necessary to carry the Commission over to the next session of the Legislature is not large, and, when we consider the object to be attained, we feel that we may safely ask for a moderate sum, without laying a very heavy additional burden upon the people. The money already expended is but a trifle compared with the benefits to be derived from a like expenditure in the immediate future.

When we entered upon the duties of our office, the whole subject of fish breeding had but lately been entertained on this coast. The ground was new, and the field of operations opened to the Commission covered a large extent of country and marked varieties of climate. We have been compelled to educate ourselves to the work in hand, and to move as cautiously and economically as possible. We are willing to admit that we take great interest in the continuance of our operations; we know that we have learned a great deal about fish culture that will be useful to the State. We believe that we are now on the road to success. We are willing to give our time to it, and perhaps it is not amiss for us to make this report the means of saying that, which may not be generally known, our services are without charge of any kind to the State. We have no individual interests to subserve, and we only ask aid from the State in order that we may serve her, and carry out to completion the objects for which this Commission was created.

EXPENDITURES.

At the last session of the Legislature, an appropriation of two thousand dollars was made to aid the Commissioners in prosecuting their work, and, since our last biennial report, we have expended the following amounts:

1873.		
Jan. 25...	Paid for advertising in <i>Union</i>	\$22 75
Jan. 25....	Paid for copying report.....	59 50
Jan. 27....	Paid Comer & Co., for Tahoe trout for South Yuba.....	300 00
March 17.	Paid telegraph.....	50
April 19...	Paid expenses of establishing hatching station at Clear Lake, expenses of hatching white fish eggs, and examination of Clear Lake, Blue Lake, and other waters.....	547 26
May 3.....	Paid Acclimatization Society for speckled trout placed in San Andreas Reservoir.....	100 00
May 5.....	Paid Acclimatization Society for speckled trout placed in the tributaries of Alameda Creek...	100 00
May 10....	Paid reward for first shad taken.....	50 00
June 3....	Paid traveling expenses of Commissioners.....	44 00
	Paid traveling expenses of R. H. Elam, as Fish Warden, to Santa Cruz.....	60 00
	Paid Haight & Temple, for legal services.....	50 00
	Paid Bugbee for drawings for fish ladders.....	30 00
	Paid Cleveland for fitting up breeding troughs..	77 28
	Paid T. H. Selby & Co. for lead pipe.....	38 09
June 12...	Paid expenses of defending salmon laws.....	48 25
	Paid Acclimatization Society for trout placed in American River.....	100 00
July 2....	Paid expenses of Commissioner to Sacramento to meet shad.....	8 75
July 10...	Paid Comer & Frazer for Tahoe trout placed in Lake Merced, six thousand in number.....	120 00
July 14...	Paid J. G. Woodbury for services enforcing the salmon laws.....	104 50
	Carried forward.....	\$1,761 88

Brought forward.....	\$1,761 88
Paid Acclimatization Society for six thousand Tahoe trout, placed in Alameda Creek.....	120 00
Paid expenses of placing the same.....	51 50
Paid total expenses of the aquarium car bring- ing fish, eels, and lobsters from the Atlantic Coast to California*.....	3,912 18
Total amount expended.....	\$5,845 56

*A part of this amount will be restored by a settlement now pending with the railroad companies.

RECAPITULATION.

Amount of appropriation of eighteen hundred and seventy.	\$5,000 00
Amount of appropriation of eighteen hundred and seventy- two.....	2,000 00
Total.....	\$7,000 00
Expenditures, as per report of eighteen hundred and sev- enty, and of eighteen hundred and seventy-one.....	\$1,137 22
Expenditures, as per report of eighteen hundred and sev- enty-two and eighteen hundred and seventy-three.....	5,845 56
Cash remaining on hand December thirty-first, eighteen hundred and seventy-three.....	17 22
Total.....	\$7,000 00

All of which is respectfully submitted.

S. R. THROCKMORTON,
B. B. REDDING,
J. D. FARWELL,
Commissioners.

APPENDIX.

COMMISSIONERS ON FISHERIES.

UNITED STATES.

PROFESSOR SPENCER F. BAIRD..... Washington, D. C.

MAINE.

E. M. STILLWELL..... Bangor.

HENRY O. STANLEY..... Dixfield.

NEW HAMPSHIRE.

THOMAS E. HATCH..... Keen.

WILLIAM W. FLETCHER..... Concord.

W. A. SANBORN..... Wiers.

VERMONT.

M. C. EDMUNDS..... Weston.

M. GOLDSMITH..... Rutland.

MASSACHUSETTS.

THEODORE LYMAN..... Brookline.

E. A. BRACKETT..... Winchester.

ASA FRENCH..... South Braintree.

CONNECTICUT.

WILLIAM M. HUDSON..... Hartford.

ROBERT G. PIKE..... Middletown.

JAMES A. BILL..... Lyme.

RHODE ISLAND.

NEWTON DEXTER..... Providence.

ALFRED A. REED, JR..... Providence.

JOHN H. BARDEN..... Scituate.

NEW YORK.

HORATIO SEYMOUR..... Utica.
 ROBERT B. ROOSEVELT New York City.
 EDWARD M. SMITH..... Rochester.

NEW JERSEY.

R. P. HOWELL..... Woodbury.
 J. H. SLACK..... Bloomsbury.

PENNSYLVANIA.

H. J. REEDER..... Easton.
 B. L. HEWITT..... Holidaysburg.
 JAMES DUFFY..... Marietta.

VIRGINIA.

WILLIAM B. BALL..... Mid Lothian.
 ASA WALL..... Winchester.

ALABAMA.

CHARLES S. G. DOSTER..... Montgomery.
 RO. TYLER..... Montgomery.
 D. R. HUNDLEY..... Courtland.

CALIFORNIA.

B. B. REDDING..... Sacramento.
 S. R. THROCKMORTON San Francisco.
 J. D. FARWELL..... San Francisco.

MICHIGAN.

GOVERNOR J. J. BAGLEY..... Detroit.
 GEORGE H. JEROME..... Niles.
 GEORGE CLARK Ecorse.

OHIO.

JOHN HUSSEY..... Loveland.
 JOHN H. KLIPPART..... Columbus.
 DR. ELISHA T. STIRLING..... Cleveland.