

California. Dept. of Fish and Game.
Biennial Report 1910-1912.

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BIENNIAL REPORT

OF THE

DEPT. 4 FISH AND GAME COMMISSION

1910-1912

STATE OF CALIFORNIA

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Biennial Report 1910-1912.

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STATE OF CALIFORNIA

FISH AND GAME COMMISSION

TWENTY-SECOND BIENNIAL REPORT

For the Years 1910-1912



FRIEND WM. RICHARDSON, SUPERINTENDENT OF STATE PRINTING
SACRAMENTO, CALIFORNIA

1913

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LETTER OF TRANSMITTAL.

SAN FRANCISCO, CAL., December 31, 1912.

Hon. HIRAM W. JOHNSON, GOVERNOR,

State of California, Sacramento, Cal.

SIR: In accordance with law, we submit for your consideration a statement of the transactions and disbursements of the Board for the biennial term July 1, 1910, to June 30, 1912.

We are also including certain data concerning the transactions of the Board between July 1, 1912, and the date of this report, believing that the value of such data has justified holding the report for it. Certain technical reports which have hitherto been included in the Board's report are this year being issued in separate bulletins.

Respectfully,

F. M. NEWBERT, *President,*

M. J. CONNELL,

CARL WESTERFELD,

Board of Fish and Game Commissioners.

CALIFORNIA FISH AND GAME COMMISSION.

Commissioners, 1910-11.

| | |
|-------------------------------|---------------|
| M. J. CONNELL | Los Angeles |
| W. G. HENSHAW | San Francisco |
| F. W. VAN SICKLEN | Alameda |
| LENDAL M. GRAY | San Francisco |
| DR. DAVID STARR JORDAN | Palo Alto |
| GEO. V. STEED | San Francisco |
| F. G. SANBORN | San Francisco |
| CHAS. A. VOGELSANG | San Francisco |
| <i>Chief Deputy, 1910.</i> | |
| JOHN P. BABCOCK | San Francisco |
| <i>Chief Deputy, 1910-11.</i> | |
| HARTLEY F. PEART | San Francisco |
| <i>Attorney, 1910-11.</i> | |

Commissioners, 1911-12.

| | |
|---------------------------------------------|---------------|
| M. J. CONNELL | Los Angeles |
| F. M. NEWBERT | Sacramento |
| CARL WESTERFELD | San Francisco |
| ERNEST SCHAEFFLE | San Francisco |
| <i>Secretary, 1911-12.</i> | |
| W. H. SHIBLEY | Sisson |
| <i>Supintendent of Hatcherics, 1911-12.</i> | |
| R. D. DUKE | San Francisco |
| <i>Attorney, 1911-12.</i> | |

PART I. GENERAL.

TWENTY-SECOND BIENNIAL REPORT OF THE BOARD OF FISH AND GAME COMMISSIONERS.

PERSONNEL AND ORGANIZATION.

Since July 1, 1910, the personnel of the Board has been as follows: M. J. Connell, W. G. Henshaw and F. W. Van Sicklen served until November 3, 1910, when Lendal M. Gray was seated as a member, succeeding F. W. Van Sicklen, resigned. On November 4, 1910, Dr. David Starr Jordan was seated as a member, to succeed W. G. Henshaw. Upon the death of Commissioner Gray in December of 1910, Geo. V. Steed was appointed to serve, but was never seated as a member of the Board. F. G. Sanborn was seated as a member on January 21, 1911, to succeed Mr. Steed. On August 4, 1911, F. M. Newbert was seated as a member of the Board, to succeed Dr. David Starr Jordan, resigned. Carl Westerfeld presented his credentials on January 2, 1912, and was thereupon seated as a member, to succeed F. G. Sanborn.

On August 11, 1910, John P. Babcock assumed the position of Chief Deputy, succeeding Chas. A. Vogelsang, who had been the Board's executive officer since October 12, 1901.

On November 29, 1911, the Board by resolution, abolished the position and title of Chief Deputy, and appointed Ernest Schaeffle as Secretary, to succeed Mr. Babcock, whose resignation had been tendered and accepted that day.

On the same day the position of Superintendent of Hatcheries was created, and W. H. Shebley, Superintendent of Sisson hatchery since 1893, was promoted to the place. Mr. Shebley has remained in charge of Sisson hatchery, being assisted in the management by R. W. Requa, assistant superintendent, and has in addition directed the Board's work in the field of fish culture and distribution. During the past nine months Mr. Shebley and his assistants have also made surveys of practically every dam and other stream obstruction, and of many of the ditches and canals in the State and have had charge of the construction of fishways and screens.

Hartley F. Peart, who had acted as the Board's attorney for over five years, presented his resignation on February 6, 1912. Mr. Peart's resignation was accepted and R. D. Duke of San Francisco appointed his successor.

Since the filing of the Board's last report, it has been deemed expedient to form a new administrative district, in addition to the San Francisco, Los Angeles and Fresno districts, already existing. The new district is in charge of Commissioner Newbert, with an office in

the Forum building in Sacramento. District management adds to the cost of administration but, in the Board's opinion, greatly increases efficiency. It will probably be found necessary within the next two years to further divide the northern part of the State.

PROPERTIES.

At the request of the State Controller an inventory of the State's property in the care of the Board was taken on June 30th of the present year. A skeleton inventory that will be found elsewhere in this report shows the total value of property under appropriate headings.

PEACE OFFICERS.

It should be plainly stated at this time that the enforcement of the fish and game laws of the State has been left almost entirely to the Board, except in those communities and counties so fortunate as to possess public officers alive to their responsibilities and to the value of assisting in the saving of one of the State's most important assets. The Board has received and appreciated the endorsement and support of many police, prosecuting, and judicial officers in the State and expresses this criticism with the greatest regret and the knowledge that it will cause some ill feeling and friction. The property of the people is at stake, however, and we feel that we would be recreant to the trust imposed upon us if we did not call attention to what we have learned to be a real evil.

Many fish and game officials object to any coöperation between game wardens and peace officers, arguing that no one but a specialist is competent to act in work that is so peculiarly a specialty as fish and game wardenship. The argument does not seem a sound and sufficient one, although we must grant that the best work to be done by game wardens can only be done by officers specially and thoroughly trained in the ways of fish and game, and of fishermen and hunters.

FOREST SERVICE CO-OPERATION.

The Board wishes to speak of the splendid assistance it has received from the United States Forest Service, under the direction of District Forester Coert Du Bois, ably assisted by the supervisors of the nineteen national forests (or forest reserves) in the State. Upon the recommendation of Mr. Du Bois and the supervisors, the Board has deputized over three hundred forest officers, or "rangers," and knows that splendid work has been accomplished by them.

An effective coöperation between the two departments is made possible only by a system of direct supervision, by chief forest deputies on each forest, devised by Mr. Du Bois. Through it the Board is relieved of the necessity of issuing instructions to and receiving reports from over three hundred active men, who undoubtedly are more efficiently and satisfactorily directed by their own chiefs. Each chief forest deputy files a special report with the head office of the Board on the first day of January and on the first day of July of each year, in addition to keeping up a more or less regular correspondence.

By a ruling of the Forest Service, none of its officers can receive compensation for assisting in the enforcement of state laws; it has been possible, however, for the Board to pay the expenses necessarily incurred by forest officers in the prosecution of fish and game cases.

SALARIED, OR REGULAR DEPUTIES.

The Board has a force of deputies (patrolmen or game wardens) distributed over the State at the present time, apportioned to districts as follows: San Francisco, 24; Sacramento, 29; Los Angeles, 11; Fresno, 9.

This force has been built up very largely since 1907, when the revenues of the Board were increased through the first receipts from hunting license sales, and in the opinion of the Board constitutes a very effective and creditable body of officers. The splendid police record made by these men, as shown in the statements of seizures and prosecutions, published in this and in previous reports, is the highest praise that need be offered them.

The state "game wardens" of California are probably the best paid wardens in the world, and the Board believes that every man on the roll is worth what he receives, if not more. Cheap men could be obtained, of course, but men who can do the work needed in this State are not cheap men, and are available for the state's service only as they are assured of proper compensation.

The deputies, or "wardens" in each administrative district, report to the Commissioner or deputy in charge of the district and perform their duties as directed by him. The head office has only the most general supervision of the work within the outside districts and is seldom required to act in even an advisory capacity.

"OUTSIDE," OR SPECIAL DEPUTIES.

The special deputies assisting in the Board's work now number about 400 men, exclusive of forest officers. Many of these deputies have records that compare favorably with those of the most efficient regular officers, while the force as a whole serves as a very valuable and thoroughly appreciated auxiliary. Even if little police work were done by this body of irregular officers, it would still serve as a training school from which to recruit regular deputies.

Every effort is made to keep undesirable candidates out of this force and to weed out with the least possible delay all those who prove unfitted from any cause.

The special deputies receive no salaries, but are paid for their services in prosecutions and are sometimes allowed expenses.

PROGRAM AND WORK.

We recognize that we are administering a public trust, that to us has been assigned the duty of protecting and conserving the fish and game interests of the State for the benefit of all the people, and that to be successful we must have their active coöperation. We believe we can gain their confidence and support by keeping the people fully informed of the nature and scope of our work. We shall attempt to

do this by issuing letters and bulletins from time to time, as well as by complying with that provision of the law which specifically requires this Board to biennially submit to the Governor a full report.

We aim to work on broad, practical and economical lines, and to make the Commission something more than a police force. We shall endeavor to enforce the laws for the preservation of fish and game, and to stock the public waters of the State with food and game fishes best suited to them. By economic and scientific investigations we hope to disclose the life, habits, and abundance of our fish and game, and the conditions most favorable to conserve and, if possible, increase the supply.

We shall maintain a State Game Farm, and shall use every effort to propagate our native species of game, and in particular, the valley quail, recognized as one of the finest game birds in the world—and certainly the game bird best suited to the uplands of this State.

We shall continue to operate the fish hatcheries to their full capacity, and to distribute the output in suitable public waters in every section of the State. We will not stock private waters. We shall give to the distribution of the fish produced in the fish hatcheries the greatest care, endeavoring not only to see that the young fish are intelligently liberated where they may best thrive, but by close observation to ascertain the success of such methods, and to ascertain further if additional and more effective measures can be found.

It has already been demonstrated that the operations of the hatcheries and the stocking of streams in the State with native and non-indigenous fish have produced great results. No other state has reaped as great reward from the moneys so expended.

We believe that, notwithstanding the notable success that has already followed the introduction and the acclimatization of new food and game fishes in the waters of this State, as well as the propagation of our native fishes, much can yet be accomplished; that our waters may be made to produce even more abundantly; for, notwithstanding that this Commission has been in existence for forty years and has accomplished greater results than any similar commission in the United States, very little attention has been directed to a study of the life and habits of any of our food fishes. To intelligently conserve and increase our aquatic food supply it is essential to be conversant with the life, habits, food, abundance and the principal enemies. Until we know the time and place where our food fishes propagate, the waters frequented by their young, and the conditions essential for successful development, we can not proceed intelligently. And, we regret to say that until recently, the Commission was not in possession of sufficient positive information of this character. To obtain such knowledge, we have during the past eighteen months begun a systematic and scientific investigation of the life of our most important food and game species. For this work we have been enabled to enlist the services of several well known scientific men.

The study of the life, abundance and the conditions most favorable to the maintenance of our edible crab (*Cancer magister*) was begun under the auspices of the Board in October of 1910. The work is in the hands of F. W. Weymouth of Stanford University, who is a recognized authority. At the time this investigation was instituted little was known as to where or when these crabs propagate, or the life of their young.

Professor Harold Heath of Stanford University, at our direction, began in December of 1910 a research intended to disclose the life and range of our edible clams. Very little or nothing is known of the life of these valuable mollusks. There appears, however, to be only a limited area in this State which affords opportunity for their existence, and in consequence, we believe that there is great danger that, with the increasing demand and the present unrestricted methods of digging them, the clam beds of the State may be speedily exhausted. We hope, through the efforts and studies of Professor Heath and his assistants, to be able to lay sufficient facts before the legislature to warrant the adoption of measures that will insure the future supply.

The spiny lobster, or "crawfish" fishery of the southern coast is a very important one, but like the other fisheries has been greatly reduced by the heavy operations of recent years. To obtain the accurate information necessary to any scheme of rehabilitation, Professor Bennet M. Allen of the University of Wisconsin, was engaged in July of 1911 to make a study of this animal. Professor Allen's work has been interrupted by the necessity of returning to his university for teaching, but it is hoped that a continuance of his investigation may lay bare many secrets now hidden.

In August of 1911 Dr. Chas. L. Edwards of the University of Southern California undertook a study of our abalones. Dr. Edward's preliminary report, which will be found in the Board's 1913 Fish Bulletin No. 1, is a very complete exposition of the need and value of his particular investigation.

In addition to the investigation that we have begun into the life history of our principal food and game fishes, we have also instituted an investigation of the relations of certain birds to the agricultural interests of the State. Harold C. Bryant, of the State University at Berkeley, has been engaged to conduct the inquiry. We hope to show in what manner each doubtful species of bird affects the farmer and the fruit grower, and what measures are to be taken to encourage the beneficial birds and to exterminate the injurious ones.

Believing that great good will come from the proper education of our children as to the value of the wild birds and animals to the farming interests of the State, and not alone to the sportsmen and the lovers of nature, we have engaged the services of Gretchen L. Libby, late secretary and lecturer for the Audubon Society of California, to conduct a campaign throughout the public schools of the State.

In March of the present year, it was suggested to the Board by Dr. C. A. Kofoid, Professor of Zoology of the University of California, that there was urgent need of a scientific study of the deer and other large game animals of the State. Dr. Kofoid stated that the study had been recommended to him by Dr. Palmer of the U. S. Biological Survey, as the basis for advanced conservation measures, without which our large game could not be preserved. Acting upon the recommendation of Dr. Kofoid and Dr. Palmer, Frank C. Clarke, a post-graduate student of the University of California was employed to conduct the investigation mentioned. Mr. Clarke has traveled over much of the State during the past four months, obtaining information as to distribution, numbers, breeding seasons, etc., that we consider of much value. A preliminary paper will be found in the Board's 1913 Game Bulletin No. 1.

N. B. Scofield, a fishery expert who has been in the employ of the Board at periods for a number of years, has made scientific studies of the shrimp and salmon during the past two years. Mr. Scofield has also assisted in stream surveys along the coast, and has made as thorough a study as his time has permitted of the operations of the trawl fishermen working outside the Golden Gate, and of the lampara net fishermen of Monterey Bay. Several of Mr. Scofield's reports appear in the Board's 1913 Fish Bulletin No. 1.

A very large and important part of the Board's work in the last ten years has been the regulation of various industries in order to prevent or minimize the pollution of the State's waters. While the results obtained are not yet fully satisfactory, we believe that the Board's work deserves public approval.

Outside of cities with their sewage, the principal sources of stream pollution at present are quartz mills and oil refineries, oil loading stations and oil carriers. All of these sources are now in the way of proper handling, after the expenditure of much effort and money.

As will be shown by this and by reports filed previously, the Board has instituted a considerable number of prosecutions for the pollution of State waters. By far the greater work, however, has been done in obtaining a compliance with the statutes through less expensive and tedious means. It is impossible to obtain even an estimate, but we believe that \$250,000 has been spent at the Board's direction in the past two years in constructing oil traps and settling basins, proper hose and pipe connections, acid recovery plants, lampblack and oil-tar separators and filters, sawdust burners, and other contrivances and systems having as their sole purpose the safeguarding of public waters and the protection of the aquatic life therein.

WHAT THE COMMISSION HAS DONE IN TWO YEARS.

Has taken its place in the front rank of state fish and game commissions by instituting and prosecuting scientific investigations of game

and fish, in almost every case with the coöperation or under the direction of the State's leading universities.

Has placed the work of fish culture and distribution on a proper foundation by creating the position of Superintendent of Hatcheries, by appointing a highly qualified expert to the place, and by then allowing him to manage the department.

Has made the greatest and best distribution of trout (over 26,000,000) ever made in the State.

Has provided a department of game conservation, under the direction of a competent expert, which in time will be as important as the fish cultural department.

Has economically managed the State Game Farm, and distributed more pheasants during the season of 1912 than were distributed during three previous years.

Has increased the force of wardens by over twenty men, providing an effective patrol for every part of the State, and particularly the northern part.

Has increased the efficiency of the wardens by detailing special deputies, the Board's attorney and others, to instruct them as to their duties and the subjects with which they have to deal.

Has greatly increased the efficiency of the service in the northern part of the State by forming the Sacramento district from a district that comprised almost fifty per cent of the total area of the State, and by leaving the direction of business in this district to the President of the Board.

Has fairly but firmly enforced all the fish and game laws in every part of the State, prosecuting 2,063 cases, against 1,771 for the best previous two-year period. (The record for the past two years would be much greater were it not for the fact, in the Board's opinion, that violations are becoming less and less common.)

Has aroused public interest in fish and game conservation by directing and otherwise aiding in the formation of a great and representative protective organization, with a membership of over 16,000 people, scattered through every county in the State.

Has made surveys of almost every stream and lake and other body of water in the State, disclosing the fact that hundreds of square miles of water have passed out of control of the public, and that hundreds of square miles are still entirely barren or have no valuable fish.

Has made a comprehensive survey of the natural and artificial waterways of the State, following this by directing the construction of hundreds of screens and fishways.

Has watched the disposition of factory and other waste products, instituting prosecutions and otherwise striving to abate known causes of damage.

Has removed rocks, timber blockades and other obstructions in a number of streams in northern California.

Has transplanted hundreds of thousands of trout, black bass and

striped bass from overflow waters along the coast and in the interior valley.

Has been one of the first commissions in the country to provide its patrolmen with motoreyes, thus reducing transportation expenses and greatly increasing efficiency of force.

Has perfected a coöperation of effort with the U. S. Forest Service, whereby the State secures without cost the services of over 400 highly trained officers, almost all of whom are located in the best fish and game regions.

Has from the head office alone written or issued about 25,000 individual letters, 50,000 copies of circular letters, 325,000 abstracts, or synopses of the fish and game laws, 12,500 game law posters, 8,000 copies of the Board's compilation of the fish and game laws, thousands of copies of the several bulletins and reports already issued, and a great deal of other matter. (About 300 newspapers and periodicals in the State are on the Board's mailing list; to them all is sent each month a statement of the lion bounties paid for the previous month, another statement of the searches, seizures and arrests made by the different districts, and a statement of the Board's expenditures for the month past. If any of these statements are omitted for a month or more, a statement covering the elapsed time is issued.)

Has made studies of general fish and game conditions, and of fishing methods and apparatus, through the Superintendent of Hatcheries, the Assistant in Charge of Game Conservation, and other scientific assistants, and by deputies.

Has made a systematic study of the climatic and other conditions that determine the distribution of plant and animal life, with the idea of preventing the loss of effort, time and money that has occurred in the past through experiments in game introduction and transplantation that were not based on knowledge of vital facts.

RECOMMENDATIONS.

It will be noted that the Board offers no recommendations as to changes in existing legislation or the provision of new. The following quotation from a letter issued by the Board during the fall of 1911 sets forth fully the attitude of the present Commission and explains its deviation from an old practice:

“It has often been said that the fish and game laws of the State of California were passed in the interest of a favored few, to the prejudice of the great mass of the citizens of our State.

Such impression has gone forth, doubtless, by reason of the fact that the people generally have had but little, if any, voice in suggesting or proposing legislation upon the subject, resulting in lack of co-operation by the people with the Commission, without which co-operation neither beneficial laws can be passed, nor material progress be made.

The Commission sincerely desires the active, hearty and earnest

co-operation of all the people of this State in the great work which is before it.

This Commission will be for the people, and it wants their expression as to the laws most suitable for their districts. In other words, it wants the people of the great State of California to say to the Commission, 'We want this and we want that,' and not for the Commission to say, 'We will give you this and we will give you that.' "

Such recommendations as may be found in this report are to be considered as representing the personal views of the specialists submitting them. The Board does not *necessarily* endorse any of them.

ACKNOWLEDGMENTS.

The Board desires to express its sense of deep obligation to the State commissions and departments, and to the universities, scientific institutions and individual scientists in the State and country, whose hearty support during the past two years has made possible the prosecution of many technical investigations. Particularly is the Board indebted to the University of California, the University of Southern California and to Leland Stanford Junior University, for not only support, but for active effort and the direction of difficult studies.

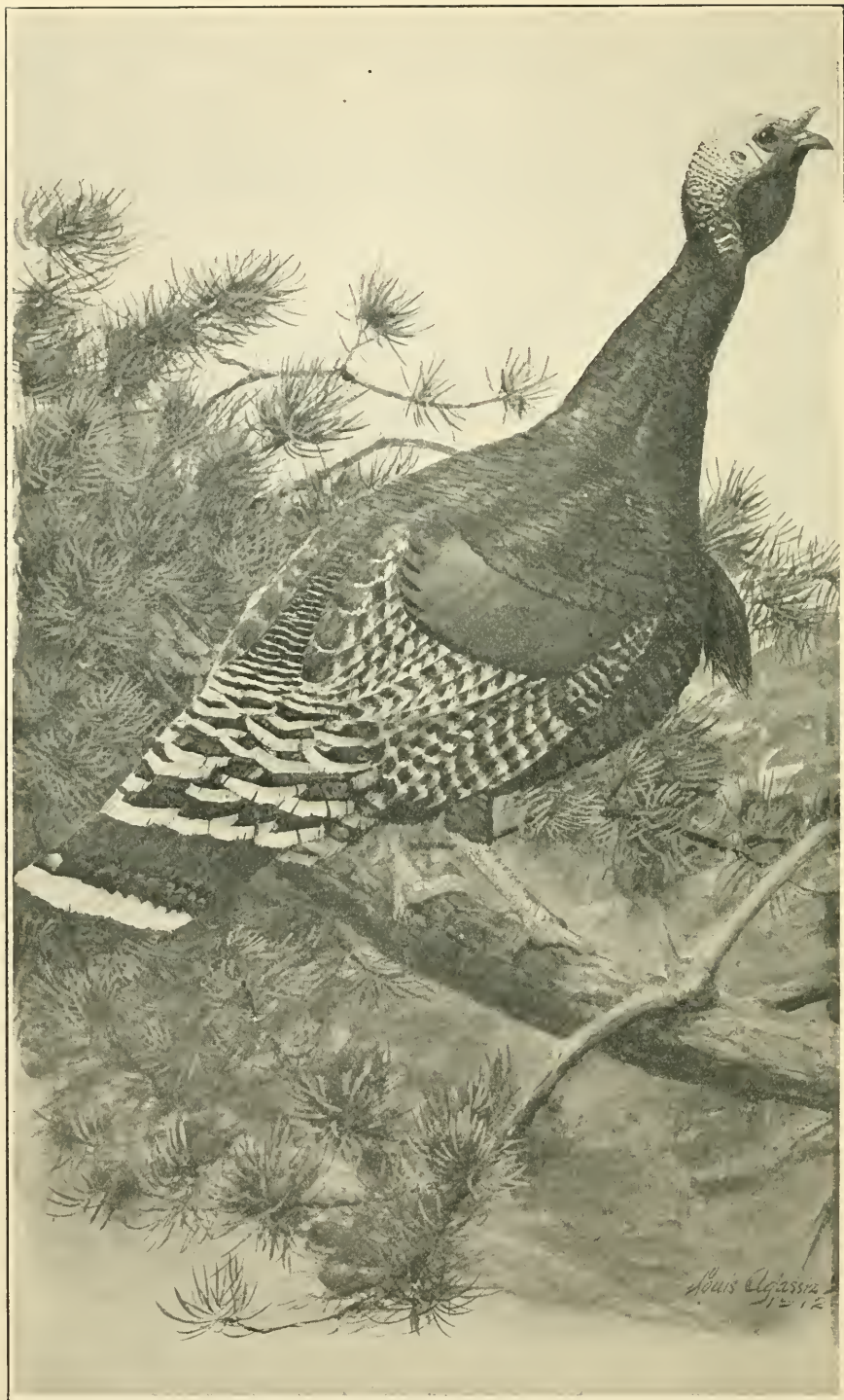
We wish also to thank, personally and officially, the many railroad and other transportation officials in the State, through whose unflinching courtesy the transportation of fish and attendants and special employees, has been possible. Without the free and reduced rate transportation of fish and fish eggs and game, that has been provided by the Southern Pacific, the Western Pacific, the Sierra, the Northwestern Pacific, the Lake Tahoe Railway and Transportation, the Nevada-California and Oregon and other railway companies and by the Pacific Coast Steamship Company and the Wells Fargo and Globe Express Companies, the distribution made by the Board would have been but a part of the gratifying total reported.

In concluding this report we desire to state that during the year that has just past every possible encouragement and assistance has been given by the public. Any success that may have crowned our undertakings must be credited to this favorable and growing sentiment.

Respectfully submitted.

F. M. NEWBERT, President,
M. J. CONNELL,
CARL WESTERFELD,

Board of Fish and Game Commissioners.



Mexican Wild Turkey (*Meleagris gallopavo*).

GAME CONDITIONS IN CALIFORNIA.

By J. S. HUNTER,

In charge Game Conservation, Fish and Game Commission.

As a people we have been slow to realize the importance of the wild life of our country. Our love of hunting has caused the extermination of some of our characteristic varieties of game. In our desire to have a full game bag to our credit, we have been reaching out to the more inaccessible places where game still approaches the conditions that were formerly common throughout the entire country. This desire to protect and cherish that with which we were so abundantly favored has not kept pace with the ability to kill; so that at the present time, there is in many of the states practically no game.

In our own State, while there is not an abundance of game, enough will still remain if judgment is used in the killing that the generations to come will find a state in which game still flourishes and in which the man who enjoys the most fascinating of all sports, may go into the field with his gun and dog and participate in the pleasure of his forefathers.

Our game animals are so valuable that the title to them has been retained by the State. Of late years, the right to take this game has been refused until a hunting license was secured. The law compelling a license has been one of the most popular that has ever been enacted, not only in California, but in every state in which it has been adopted. Millions of dollars are invested in our State in guns and other hunting paraphernalia. This sum has been variously estimated as reaching into nine figures. It is perhaps safe to say that it is not less than twenty-five million dollars. Add to this sum the amount that the score of clubs throughout the State have invested in land and buildings and it will probably total over one hundred million dollars. There are sold in California alone every year twenty-eight million shotgun shells. Every industry benefits from the fact that there is game in our State. Railroads run special hunters' trains during the open seasons. The opening of the season is made the feature of window displays throughout the State. Hotels and resorts, even small towns, owe their very existence to the fact that they are established in a game country. To a great extent, the sturdiness of the American people can be attributed to their love for hunting and outdoor amusements. A state in which game flourishes attracts people from all over the world. The value of land is increased by there being game upon it.

There are present in California so many different conditions of climate and topography that it is almost impossible to create a blanket fish and game law. When deer, for example, are in proper condition to be killed in one section, they are out of condition in another. Two

years ago the legislature divided the State into game districts. Those selected were based upon artificial boundary lines without sufficient regard to natural conditions. In order to be satisfactory, districts must be based upon faunal, geographic and climatic conditions. In another part of this report will be found a suggestive districting scheme, which we believe will be far more satisfactory.

The present condition of game in the State is far from satisfactory. It is possible to secure the bag limit of any variety of game in any part of the State only with a great deal of difficulty. This is not necessarily due to the lack of enforcement of our present game laws, but to the fact that the seasons are too long, not rightly placed, that the number of hunters has been increasing year by year, and to numerous other causes.

DEER.

It is reported in many parts of the State that deer are on the increase. In view of the greater number of hunters, this is remarkable if it is correct; but it is doubtful whether careful investigation will uphold the current reports. There are probably killed in the State each year by hunters, 10,000 deer. Records were secured in 1911 of nearly 7,000, and it is safe to assume that at least 3,000 more were killed. It has been estimated that every mountain lion will kill at least 52 deer a year. Place the lion population at 250 and we can charge up 13,000 deer to lions. Coyotes and other varmints will without doubt bring the total number of deer killed up to the neighborhood of 30,000. In average years the natural death rate is not great; most of them meet violent deaths, so that 30,000 can be fairly accurately placed as the number of deer dead from all causes in the State.

ELK AND ANTELOPE.

Of the thousands of elk and antelope that formerly ranged in our State, we now have but a few scattered bands, feeble reminders to fill us with remorse for the protection we did not give such magnificent game. In the San Joaquin Valley near Button Willow and in the Sequoia National Park range are all that are left of the thousands of "tule" elk that formerly were found throughout the San Joaquin and Sacramento valleys. This species is peculiar to California. They now number between 400 and 500 head. It is reported that twenty odd years ago the band had decreased to less than twenty head. Since that time they have been given protection by the Miller & Lux Company and have now increased to their present number. On account of the size of this herd, it will soon be necessary for the State to take care of them, as no private interest can stand the expense of so great a number of large animals ranging at will through fences and over fields. The writer and Professor Grinnell of the University of California during the past summer visited this section of the State, and a plan

was formulated which it is believed would result in properly caring for the "tule" elk. It is hoped that something along the lines suggested by Professor Grinnel in the following report, can be adopted:

BERKELEY, CALIFORNIA, June 13, 1912.

*State Fish and Game Commission,
San Francisco, California.*

GENTLEMEN: I submit herewith a statement in regard to the dwarf elk (*Cervus nannodes*), as it occurs at the present time in the San Joaquin basin. This information was obtained largely by Mr. J. S. Hunter and myself during the last ten days in April, 1912. During this period we explored the district west from Bakersfield, in Kern and San Luis Obispo counties.

According to the consensus of the accounts given us by old residents of the region, elk formerly ranged in considerable numbers throughout the Sacramento and San Joaquin basins, south to the immediate environs of Bakersfield, thence west through the inner coast ranges and intervening valleys as far as the plains of the Cuyama Valley, in San Luis Obispo County, and extreme northern Santa Barbara County. Before they had become much reduced in numbers, in the sixties, elk occupied most of the tule swamp region of the bed of the San Joaquin Valley. On this account this species of elk has been frequently called the "Tule" elk. The animal, however, ranged up into, and through, the barren ranges of hills all along the west side from west of Tulare Lake south to the vicinity of Maricopa.

By the year 1874 the elk had disappeared throughout nearly all of this territory. One report has it, that in 1874 but one single pair of elk remained between Tulare and Buena Vista lakes. These were on the property of Henry Miller. This gentleman decided to save this remnant if possible, and offered large rewards for information leading to the identity of any one molesting the animals. It is said that the fine herd of elk now existing, has descended from *this pair of animals preserved by Mr. Miller*.

The cause of the rapid decrease in the original numbers of elk is said to have been due to hunters, who make it a business to "jerk" elk meat, and sell it to prospectors on the desert.

It would appear that the dwarf elk never ranged outside of the lower Sonoran life zone within the San Joaquin-Sacramento basin. There was, however, a slight seasonal shifting. To this day, the does go up into the hills during the season when the fawns are born. At this time, too, bands of bucks range high into the hills, but not, generally, above the limits of the temperature conditions existing in the lower Sonoran zone.

The point I wish to bring out here is that this species of elk can not be expected to thrive if transported into any other faunal area than that in which it was originally native. There is no barrier to prevent the dwarf elk spreading high up into the pine belt of the Sierra, or even into the Mojave desert, or west into the coast district. But they did not go, finding the different climatic conditions prohibitive.

The rate of reproduction, that is, the rate of increase, of the dwarf elk is believed to amount to the doubling of the herd every four years, as long as conditions remain normally favorable. It is obviously, however, impossible for such a rate of increase to have been maintained since the original nucleus of the herd was first given protection. It is probable that there are good grounds for believing the numerous rumors, that there has been more or less poaching, even up to within a very few years.

Our investigations in April resulted in our belief that there are at the present time very close to 400 head of elk ranging from Buena Vista Lake to the vicinity of Button Willow and thence west into the elk hills; and as far as known, these are all of the representatives of the species in existence, save for a few which were removed in 1904 to the Sequoia National Park, and a very few in confinement elsewhere. The main herd remains a large part of the time on the valley lands belonging to Miller & Lux, and the Kern County Land Company.

There is no denying the fact that the presence of this great number of animals running at large, inflicts serious injury to these properties. We saw elk crowd through fences and trample fields of standing grain. I am informed upon good authority, that it is estimated that on the Miller & Lux property alone, \$5,000 worth of damage is done each year by the elk, in breaking fences, and in trampling alfalfa and grain outside of what forage they actually consume.

The elk pay absolutely no attention to the ordinary cattle fence. We saw them go over both barbed-wire and rail fences with the greatest ease. The elk prefer, however, to crowd through if they can, as we observed in several cases.

The problem presenting itself for immediate action on the part of every one interested, is that of securing a permanent range. Everything points towards the rapid subdividing of the large land holdings into farms. No single owner can then stand the ravages of the elk. It is not for a moment to be supposed that any one advocates the unlimited protection of elk under the present conditions of rapid settlement of the California valleys. It is, however, consistent with the highest ideals of conservation that at least a representation of the animal be preserved in as nearly their native surroundings for all time. The steps leading to this consummation must be taken at once, while there is yet the opportunity of securing adequate areas of land in their native domain.

Nothing is more certain than that only failure can attend any attempt to move the elk from the limits of their native range. This was abundantly proven by the disastrous results of the "drive" of 1904 when the attempt was made to remove the entire herd to the Sequoia National Park.

The following suggestion has been made, as receiving favorable consideration by several persons qualified to judge, who are intimately interested in the problem: That three sections of land be acquired, one of these to be located in the bed of the valley between Buena Vista and Tulare lakes, the other two to lie to the westward, up into the elk hills. The first designated section should be of first class land (which is now valued in that vicinity at \$100 an acre—\$64,000 for the section). This section of arable land would have to be purchased or donated, but it is probable that the adjacent two sections of desert land could be secured under some sort of lease from the Federal Government.

The three square miles thus indicated would have to be completely fenced to keep the elk from doing depredations to the surrounding country. A special elk-proof fence would have to be constructed, and at a cost of \$800 to \$900 per mile. Such a fence would have to be at least seven feet high, and of such materials that elk could not break through. Of the arable section of land, at least 250 acres should be grown to alfalfa. This in connection with the native forage on the uplands would support about 500 elk.

It is suggested that further increase of elk could doubtless be disposed of from year to year for eating, or for stocking elsewhere. Such sale might establish the means of permanent support, to defray the salary of a man continually in charge, and the extra labor necessary in haying time.

The above brief outline for the establishment of a refuge for the dwarf elk I believe to be not only feasible but immediately necessary if we are to expect the preservation of this, one of the most interesting species of native game animal in California. It seems to me that the State Board of Fish and Game Commissioners could carry out the necessary details with much less difficulty than at the outset might be anticipated. Successful accomplishment would bring everlasting commendation for the far sightedness of this undertaking.

Respectfully submitted and recommended.

(Signed) J. GRINNELL,
Museum of Vertebrate Zoology,
University of California.

Besides the "tule" elk, another variety is found in very small numbers in the more humid parts of the State, in Humboldt and Del Norte counties. On account of the nature of the country, which is covered with timber and brush where this species range, it is difficult to accurately estimate their numbers. There are several small bands, numbering from six to twelve animals. It is safe to say that they do not total over 200 individuals. The people living in that part of the State are coöperating in ensuring these animals absolute protection, and it is to be hoped that they may be saved.

The antelope is more extensively distributed. A few are still found in the desert region bordering on the Colorado River in the extreme southeastern part of the State; some are also found in Antelope Valley,

in the northeastern part of Los Angeles County, while in western San Joaquin Valley the largest band of the State is found. These number upwards of 150 individuals. In Modoc, Lassen and Siskiyou counties there are several small bands. All told, there are probably about 600 antelope left in the State. The antelope does not take well to domestic conditions. They tame easily, but up to the present time, no success has been had in the breeding and raising of them in captivity. The adult animals soon lose their vitality and in a few months will pine away. If some part of our State that is adapted to the antelope could be set aside as an antelope range, where they would be given absolute protection, it is believed that this species could be perpetuated. If such refuge should be established, it will be necessary to keep sheep from grazing on the land, as antelope and sheep will not get along together. As a rule, the land where antelope is found is almost worthless from the grazing or agricultural standpoint. The antelope is one of the most interesting of our North American game animals, and if by reasonable effort we can save them, we will be well repaid for our trouble.

MOUNTAIN SHEEP.

The mountain sheep still flourish in considerable numbers in the southeastern part of the State. Formerly they ranged over the entire Sierra Nevada region and across into the lower Coast Range as far north as San Luis Obispo County, but they now are restricted to the most inaccessible portions. Professor Grinnel of the University of California has about completed a report on the present status of this magnificent game animal. This report will probably be published shortly by the Commission.

BEAR.

Many of our most valuable animals as yet have received no consideration from the law. The grizzly bear is practically extinct. There are probably not half a dozen left in the State. The common brown or black bear is fairly abundant in some parts. It is for the most part a harmless species, feeding on roots, berries, grubs and insects. Rarely does a bear kill sheep or hogs. Occasionally a sheep-killing bear may be reported, but it is an exception to the general rule. They are naturally timid animals, only becoming vicious when wounded and cornered. The least unnatural sound will cause a bear to run for miles. The pelt of a well colored bear in prime condition is worth from \$20.00 to \$40.00. The law should not allow their being killed except when the pelt is prime.

FUR-BEARING ANIMALS.

Few people realize the importance of the fur-bearing animals in our State. Each year furs worth nearly \$200,000 are shipped to the various fur centers. Under our present law none of the fur-bearing animals is protected. The killing of them is allowed in every season of the year. They are worthless during the summer months but exceedingly valuable during the winter. The killing of the more valuable and least predatory species should be prohibited when their fur is of no value.

WILD DUCKS AND GEESE.

The most abundant game birds in the State are ducks and geese, although neither of them are nearly as numerous as they were in former years. Ducks formerly bred in abundance throughout the entire State. Now, owing to the reclamation of land and also to the late spring shooting, the only species that breed commonly are the cinnamon teal and fulvous tree duck. These species leave the State during the fall months and are not heavily killed by duck hunters. The only places where other varieties breed commonly are in the lakes throughout the Sierra region.

There were killed in California last year approximately one million ducks. These birds cost the hunter at least fifty cents each. Some authorities consider that they cost a dollar. Even at fifty cents, it can be easily understood what the wild ducks are worth to the people of the State. Numerous species of geese are becoming exceedingly scarce. The practice of using live decoys and animal blinds has reduced their numbers to a very small fraction of what they were formerly. Experiments should be carried on to ascertain if the geese do the damage that is attributed to them. A certain amount of pasturing of young grain has been found to increase the crop. It is possible that in some of the grain fields of the interior, the work of the geese has increased rather than decreased the amount of grain produced. Without doubt, the killing of geese should be more restricted than it is at present.

SHORE BIRDS.

Our present law on shore birds is extremely ambiguous. The season should open and close for all species at the same time. The different species are not well known to most hunters and quite often a law-abiding man unconsciously violates the law. To allow the season for any water bird to run as late as the first of May is directly contrary to the advice of men who have made a study of spring shooting. Many of the shore birds are now on the verge of extinction and it would be well to consider taking them off the list of game birds. There is no more harmless group of birds in the State, so far as the agricultural interests are concerned, and from the standpoint of game most of them are not to be seriously considered.

QUAIL.

Quail are slowly decreasing throughout most of the State, on account of the great number of hunters and the development of facilities for getting into all sections where quail are found. One cause of the decrease of quail has been attributed to in-breeding. If there is any merit in this contention, the in-breeding can be attributed to the heavy shooting, reducing the number of birds to below the safety point. In parts of the State there is urgent need of a close season for a number of years if quail are to be kept from extermination. There is some hope that the experiments in domesticating quail, now being tried by parties throughout the State, may be successful. They are comparatively easily raised and would command a very good price from bird

fanciers, if the sale were permitted. Mountain quail can probably be successfully raised above elevations of 2,500 feet. Experiments with them below that level have for the most part resulted in failures. Mountain quail have become very scarce throughout the southern end of the State, and in the coast region below San Francisco. In other parts of the State, although sometimes many of them are killed by hard winters, they are about holding their own.

GROUSE.

Ruffed grouse are fairly abundant in the extreme northwestern corner of the State. On account of the heavy brush and timber in which the birds are found, they are not hunted extensively. The blue grouse is becoming scarcer, and in all parts of the State where the settlers have engaged in sheep raising, they are almost extinct.

The sage hen is found only in the eastern part of the State, in the true sagebrush country. They have been greatly reduced where sheep have been ranged. It has been suggested that we endeavor to introduce the sage hen into Imperial County and other places of low elevation. It is probable that no success would be secured from any experiments of this sort, as the sage hen is practically never found below an elevation of 3,000 to 4,000 feet; neither is it found out of the true sagebrush country. The sage hen is our largest native California game bird and it is to be greatly desired that it be kept from extermination.

DOVES AND PIGEONS.

Perhaps the most difficult bird we have in the State to arrange a proper season for is the common mourning dove. Breeding records show that January is the only month in which they do not nest. No bird should be killed during the nesting season. On this account there are many sportsmen who advocate the removal of the dove from the list of game birds. If the proper season cannot be arranged, then this is what should be done. There is very urgent need for the protection of the wild (band-tail) pigeon. This is the slowest breeding game bird in the United States. One egg is the complete set, and probably only one egg is laid the entire year.

INTRODUCED GAME BIRDS.

Of the introduced game birds, those which have promised the best results are the ring-necked pheasants and wild turkeys. Pheasants have been liberated in various parts of the State where climatic conditions and topography were considered adapted to them. In many places very excellent results have been obtained. In Humboldt County, the birds have increased to a remarkable extent. They have also increased in parts of the Santa Clara and San Joaquin valleys. It will, however, be several years before the ring-necked pheasant can be considered abundant enough to be placed on the open list.

Wild turkeys have been liberated in the lower Sierra Nevada region, where they are reported to be doing exceedingly well. Other plants have been made in San Diego, San Bernardino, Monterey, San Benito,

Alameda, Sonoma, Shasta, and Humboldt counties. Reports that have come in are very promising and we believe that before many years the wild turkey will be one of our most prized game birds. A report of the turkey plantings made in the southern Sierra, by Deputy A. D. Ferguson of Fresno, will be found in the Board's 1913 Game Bulletin No. 1.

Hungarian partridges have been given a good trial but as yet no success has been met with. There have been very few places where they have been seen in recent months. It is possible that the Hungarian partridge will show up in unexpected places and that we may yet have this bird permanently within our State.

GAME REFUGES.

As game becomes scarcer and hunters work farther and farther into the breeding country, it will become more and more essential that certain places be left where game can have an absolute refuge. From these refuges game will spread to the surrounding open country where the hunters may have a chance to secure a fair bag. The more numerous these refuges can be, the more game will there be for the people of the State. The benefits that are to be derived from a protected area of this sort are well shown in San Mateo County. In that county there are approximately 20,000 acres of Spring Valley Water Company land. On this land there is practically no hunting. The deer are undisturbed here at all times. In the fall of the year the bucks begin to travel and may be found in every part of the county. During the present year there were killed about 154 bucks. Were it not for the Spring Valley preserved land, it is safe to say that not one tenth of this number would have been taken. If a game refuge could be established in every county in the State, we would be sure of a perpetual supply of game. There are many places that could be easily acquired at present, but as more settlers work in it will be more and more difficult, so that the time to commence is now.

GAME REARING.

In this connection it is well to say a word concerning domestic propagation of game. As it becomes more and more necessary to remove all the wild game from the markets, the public demands something to take its place. This can well be supplied from that raised in captivity. We have thousands of acres of land in this State that is excellent range for deer and upon which few of our domesticated animals can survive. This land, when properly fenced, would bring in a steady income as deer farms. Venison is one of the most delicious of all meats, and would command a high price at all times. The writer is informed by one of the leading butchers of San Francisco that he could secure from \$1.00 to \$1.50 per pound for all the venison he could obtain. Both deer and elk are readily domesticated. A law allowing the sale of such animals would not make it any more difficult to protect the wild animals; on the other hand, it would supply the demand for venison and would remove the

reason for violating the law that sometimes exists under our present system. Not only can big game be domesticated, but quail, wild ducks and other game birds can be profitably raised. It would be well for our State to adopt a law something similar to that in force in New York, which allows the raising of game and the sale of all wild game other than that native to America.

CROP DAMAGE BY GAME.

There are parts of our State where deer and small game do considerable damage to growing crops. At present there is no provision in our law that allows the killing of such animals, nor is there any provision made for the payment of damages to the owner of the crops. It would not be wise to allow the killing of game animals on account of the very numerous parties who would take advantage of the opportunity to kill game at all seasons of the year, so that some system of appraising the damage done and the compensating of injured parties is the only solution.

PREDATORY ANIMALS.

The worst game destroyers that we have are the mountain lions, coyotes and bobcats. The lion works chiefly on deer; the coyote and cat on fawns and small game. It seems impossible to devise a bounty law through which the State would not be robbed. Almost every state in the Union has tried it at different times, and nothing but failures have resulted. All these species of "varmints" do damage, not only to the game of the State, but to the stock and poultry interests, so that it would not be fair to pay a bounty out of the game protection funds entirely. If any sort of a system is devised, the money should be taken from the general fund of the State.

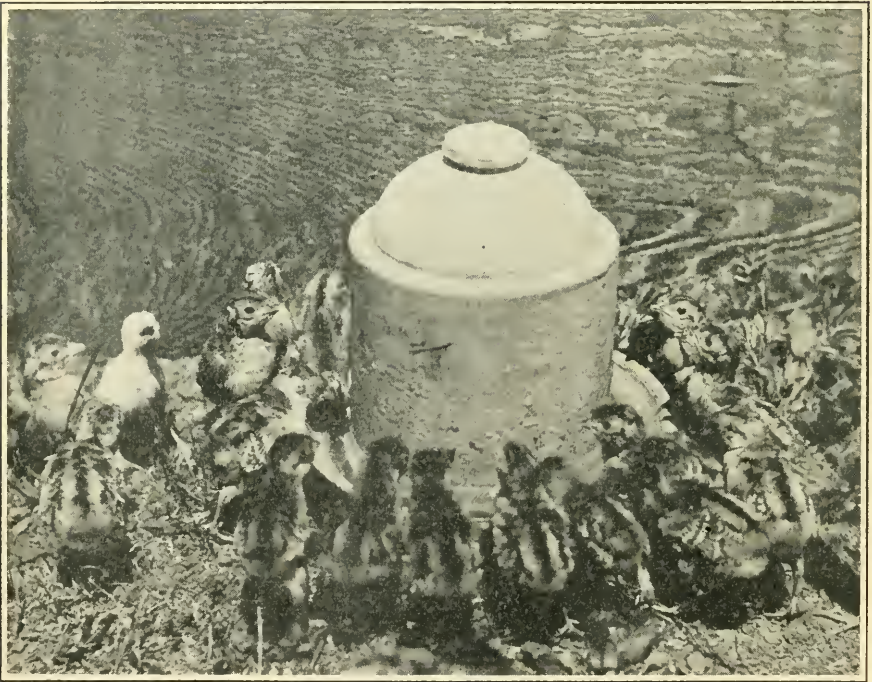
A sum of money could be placed at the disposal of the Fish and Game Commission, out of which a number of expert trappers could be paid—these men put to work systematically in parts of the State where "varmints" are most abundant. The wages of such trappers need not be great, as the men could be allowed to retain the pelts taken. By a strenuous campaign it would be possible to bring the "varmints" to below the danger point, and enough game and stock would be saved each year to more than pay for the money expended.

OPERATION OF STATE GAME FARM AT HAYWARD.

By WM. N. DIRKS, Superintendent.

I herewith beg to submit my report as Superintendent of the State Game Farm, for the season of 1912.

On account of the unsatisfactory results obtained in years past, when all eggs were hatched under the domestic hen, it was decided to learn if more satisfactory results could not be obtained by the use of incubators. A great deal of time was spent in reading what various authorities have written on this subject; but it was found that their reports



Pheasant chicks watering.

were more or less contradictory, and that only in a general way could they be relied upon. It was then determined to go ahead with actual experiments.

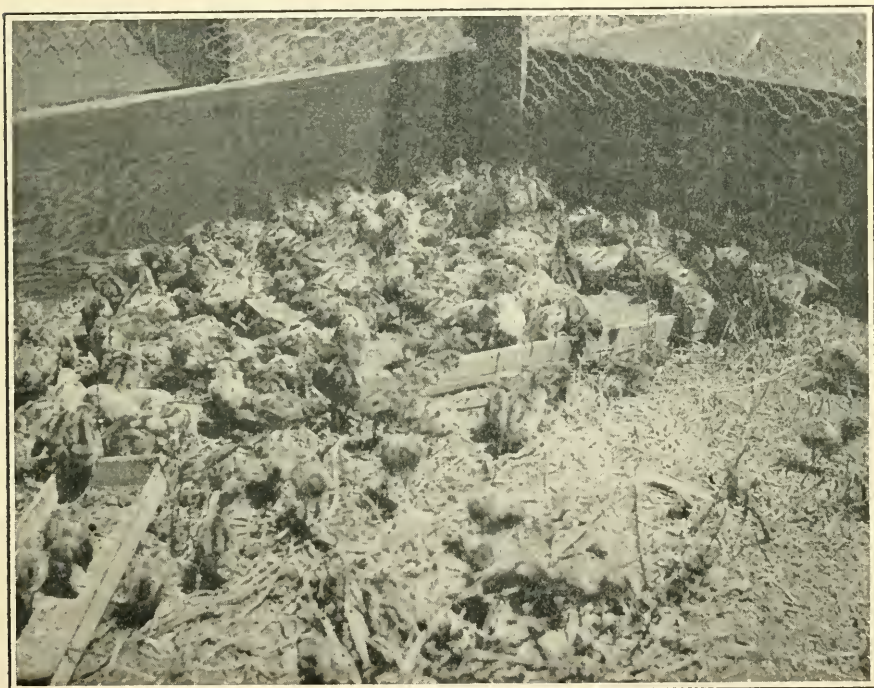
Various makes of incubators were tried and all were found to give about the same general results. Eggs were first placed in the incubator during March. Out of 13 eggs but 5 hatched—a percentage of a little over 38. Of the next lot of 517 eggs, 367 hatched, or nearly 71 per cent. Three other lots were tried, with poor success—only 40 per cent hatched.

It was then decided to set the eggs under hens for a number of days,

before transferring them to the incubators. Of the first lot of 1,100 eggs so placed, 822 hatched—a greater percentage than had been secured by the use of the incubator alone. Even better results were obtained later; out of a lot of 500 eggs, 411 were hatched, or 82 per cent.

It is a general complaint among pheasant breeders that the eggs laid toward the end of the season are weaker in fertility than those laid earlier. This has not been the case with the eggs hatched at the Game Farm during the past season; for of the last 123 laid, 100 were fertile.

It is planned, for the next year, to carry on experiments in coöperation with the State University, at the State Farm at Davis, to see if



Pheasant chicks in brooder yard at Game Farm.

satisfactory results can not be obtained with incubators alone, thus abandoning the use of hens.

Although the trial with incubators has not met with the success that was hoped for, the artificial brooder, on the other hand, has given entire satisfaction, and has proved to be far ahead of any natural method for the raising of birds in large numbers. The brooder-house is a building divided into five compartments, opening into screen runways, 8 feet wide by 90 feet long. At one end of the building a furnace is set in a shallow pit, and leading from it a terra cotta pipe laid in a trench runs the entire length of the building. This pipe is boxed in, and

covered with sand. By this arrangement a very even temperature can be maintained at all times.

The young pheasants are removed from the incubator as soon as dry. When the hatch is irregular, the older chicks may be taken out several hours in advance of the smaller ones, without harmful results.

Food is placed in reach of the little fellows within a few hours after they are taken from the incubator. For the first few days they are given a boiled custard, made in the proportion of six eggs to a pint of milk; after a day or two a small amount of cornmeal is added to this custard, and later, corn grits and fresh chopped beef. Hemp, mustard,



Valley quail in pen at Game Farm.

and canary seeds are also scattered in the pens, and after the chicks are a month old, wheat and charcoal are added. Sand and green food, such as lettuce, kale, and clover, are placed within reach of the birds at all times.

After five weeks in the brooder, the birds are strong enough to be transferred to outside pens, and almost any time after they are eight weeks of age they are ready for liberation. About this time, there is a tendency to pick each other's feathers, with the result that as soon as blood shows, the injured bird becomes an object of attack by all the other birds in the pen, and in most cases is killed.

In securing eggs, the breeding birds were confined in small pens—

one male to five hens, except in two pens, where eight and ten hens respectively were confined. From both of these pens eggs were taken equaling in fertility those taken from the pens in which there was a lesser number of female birds. Experiments along this line will be carried on during the next summer.

In raising pheasants it is very important to guard against the young birds' getting hold of any of the burrs of the burr clover, as these burrs lodge in the throat and if not removed—an operation that can be performed with the aid of a small pair of physician's forceps—will cause death.

On account of the difficulty of securing valley quail for breeding purposes, a fair test was not made with these birds, though it is believed that they can be easily raised. Of the few eggs secured, 90 per cent of those that were fertile hatched. As soon as hatched the chicks were put into a fireless brooder made of feather dusters. Ninety were raised out of 181 hatched. Extensive experiments in the raising of valley quail will be carried on during the next year.

No success attended experiments with the Gambel or desert quail. All but three of the female birds died, and on dissection it was found that although eggs had developed, owing to some unknown trouble, probably due to a change in climatic or food conditions, the birds were unable to lay them. The male birds are more hardy and practically none have died.

No attempt was made to raise a great number of wild turkeys, as the stock at the farm has been greatly run down. These birds are easy to raise and should new breeding stock be secured next year a great many birds could be raised for liberation.

PROPAGATION AND DISTRIBUTION OF FISH, SEASON 1910-1911.

SALMON PROPAGATION.

In 1910, during the months of October, November, and December, the Fish and Game Commission received as usual from the U. S. Bureau of Fisheries, a grant of 24,126,000 salmon eggs which had been spawned at the Federal hatcheries at Baird, Battle Creek, and Mill Creek. These eggs were received and cared for at the State hatcheries at Sisson, Eel River and Brookdale.

Those hatched at Sisson were liberated in the tributaries of the Sacramento, near the hatchery, with the exception of 2,215,000 which were taken down to Redding and liberated in the Sacramento. Those hatched at the Eel River Hatchery were liberated in that stream within a few miles of the sea, and those hatched at Brookdale were planted in Scott Creek and the San Lorenzo River.

In addition to the above grant, 2,109,000 of silver salmon eggs were obtained through the joint operations of the Commission and the Bureau of Fisheries, on Klamath River, near Klamathon. The eggs of the silver salmon were shipped to Sisson and hatched there, with the result that 700,000 young silver salmon were planted in Klamath River and 719,000 in the Sacramento River. This was the first effort made in this State to increase the runs of the silver salmon; heretofore hatchery propagation having been confined to the Quinnat, or Sacramento salmon.

The silver salmon, commonly called "Coho" in the north, apparently does not enter either the Sacramento or the San Joaquin rivers. There is no known reason why the fish should not enter these streams; they run abundantly in the Klamath and the Smith rivers, in Del Norte County; they are taken in considerable numbers in Eel River, in the fall; and they frequent many other of the coast streams, as far south as Monterey Bay. Strange as it may appear, the presence of the silver salmon in the waters of this State remained unnoticed until Dr. Gilbert, Professor of Zoology, at Stanford University, a few seasons ago called attention to them. Heretofore, all the salmon taken in our rivers have been commercially classed as Quinnat. The silver salmon—though a true Pacific salmon—is not considered as valuable a fish as the Quinnat; they are smaller, run late in the fall, and are lacking in color and in oil. Nevertheless they are an excellent food fish when taken as they enter the rivers from the sea. Though the silver salmon run neither into the Sacramento nor the San Joaquin rivers, as an experiment the Commission planted 719,000 in the Sacramento, at Redding, with the hope of establishing a run in that river of these desirable fish. The outcome of the experiment will be watched with interest.

TROUT EGG COLLECTION AND DISTRIBUTION.

During the winter and spring of 1910-1911 the Commission obtained from the stock fish in the breeding ponds at the Sisson hatchery, the following numbers of trout eggs:

| | |
|--------------------------|-----------|
| Loch Leven trout..... | 1,200,000 |
| Rainbow trout | 1,100,000 |
| Eastern Brook trout..... | 750,000 |
| | 3,050,000 |

In addition to the eggs collected from the stock ponds at Sisson, two spawning stations were operated on the Klamath River, for the collection of wild rainbow trout eggs; these stations obtained 2,500,000 eggs, which were eyed and shipped to the Sisson Hatchery. A station for the collecting of steelhead trout spawn was also operated at the Snow Mountain Power Company's dam, in Eel River, and 1,900,000 eggs were collected there, 300,000 of which were paid to the California Trout Farm Company, which holds the leases for operating at that dam. Three hundred thousand of the eggs taken at the latter place were shipped to the State hatchery at Grizzly Bluff, on Eel River, in Humboldt County, where they were hatched. The fry from this lot were distributed in that county. Seven hundred thousand of the eggs were shipped to the Ukiah Hatchery, which the Commission held under lease. This lot supplied fish for Mendocino, Sonoma, Marin and Lake counties. The balance of the eggs was shipped to Sisson, where they were hatched and planted in public waters. The Commission also operated the Scott Creek spawning station, owned by the county of Santa Cruz, upon a lease, under the terms of which the county hatchery at Brookdale was furnished 500,000 eyed steelhead trout eggs, from a total of 1,300,000 steelhead eggs taken at this station, 600,000 of them being shipped to Sisson, to be used in stocking public streams.

Owing to unfavorable weather conditions, only 130,000 steelhead trout eggs were collected at Grizzly Bluff, Humboldt County, but the output of that hatchery was increased by the shipment already mentioned.

In all, 5,800,000 steelhead trout eggs were collected during the season.

The season at Tahoe was much later than usual, owing to the excessive snow fall of the previous winter. Operations were begun there in May and 3,000,000 Tahoe trout eggs were collected, which were hatched at the Tahoe and Tallac hatcheries and planted in the lakes in the immediate vicinity.

The hatchery at Wawona, Yosemite National Park, was operated as usual, with eggs shipped from Lake Tahoe.

The total number of trout eggs collected for the year amounted to 11,980,000.

(This report is taken from a bulletin issued by the Board in 1911.—SECRETARY.)

REPORT OF SUPERINTENDENT OF HATCHERIES.

*Honorable Board of Fish and Game Commissioners,
for the State of California.*

GENTLEMEN: I take pleasure in submitting my report of the work done at the Sisson Hatchery and other State hatcheries during the season from December 1, 1911, to November 1, 1912; and also of my work as Superintendent of Fish Culture and Distribution. I have made monthly reports of all this work, which covered in a comprehensive way everything that was being done under my supervision. I shall, therefore, endeavor to cover in this report only such matters as will be of interest to the public or those especially interested, but perhaps less informed than your honorable Board.

The work in general is in a most satisfactory and prosperous condition, due in a very great measure to the substantial support and coöperation I have received from the Board of Commissioners. I have been in the employ of the Commission for almost thirty years, and this is the first time during that period that I have received the hearty coöperation of the entire Board. I attribute in no small measure the success of the past season to this source, and I am deeply grateful for all the encouragement and material assistance thus given.

THE SISSON HATCHERY.

The excellent condition of the buildings and surroundings at the Sisson Hatchery enabled us to escape the usual heavy expense of the past few years of the building of new structures. The fences had a new coat of paint, as did also the exterior of hatchery "A," and all of the troughs in each hatchery were newly painted. A few new flumes have been built, and new gravel bottoms have been put in some of the ponds. A great deal of ugly brush has been removed, thus putting the ponds in a neater looking, as well as more sanitary condition. The roofs of all the buildings were repaired and a new motor was installed in the feed house.

At Bogus, Shovel and Camp creeks, small egg collecting stations under the supervision of this hatchery, the buildings, traps and screens were given a thorough overhauling and at Bogus creek an addition was built to the dwelling occupied by the men during the egg collecting season.

THE DISTRIBUTION CAR.

The distribution car also came in for its share of improvements. The boiler and air pumps especially were in poor condition and in April the car was sent to the Sacramento car shops of the Southern Pacific Railroad. The aerating system was improved by doubling the number of aerating plugs in each unit, thus insuring an abundance of oxygen in each can. The fish have carried better this season than ever before. Reports received from nearly all of the applicants made mention of the excellent condition of the fry at the time of delivery.

CREATION OF NEW OFFICE.

In November, 1911, the Commission saw fit to create the new office of Fish Culture and Distribution, and I was assigned to this new division of the work. I entered upon my new duties with great interest and enthusiasm. The work at first was somewhat heavy; but I was able with the excellent assistance given me, to effect a successful organization of this new department. The duties of this work required me to be away so much that the Commission very kindly furnished me with the valuable assistance of R. W. Requa who in April was made assistant superintendent of the Sisson Hatchery. He has very ably conducted the work of this station during my long occasions of absence while I was away on tours of inspection into every section of the State.

THE HATCHING SEASON AT SISSON HATCHERY.

The season for hatching here and at the substations has been unusually successful, and I submit herewith a tabulated list of the varieties and numbers of trout hatched:

LOCH LEVEN TROUT.

| | |
|-----------------------------------|-----------|
| Eggs taken ----- | 1,500,000 |
| Loss in eyeing and hatching ----- | 206,500 |
| Left for distribution ----- | 1,293,500 |

EASTERN BROOK TROUT.

| | |
|-----------------------------------|-----------|
| Eggs taken ----- | 1,000,000 |
| Loss in eyeing and hatching ----- | 94,000 |
| Left for distribution ----- | 906,000 |

RAINBOW TROUT.

| | |
|------------------------------------------|-----------|
| Eggs taken from hatchery pond fish ----- | 1,087,000 |
| Loss in eyeing and hatching ----- | 97,830 |
| Left for distribution ----- | 989,170 |
| Eggs taken Bogus Creek Station ----- | 2,455,400 |
| Loss in eyeing and hatching ----- | 280,000 |
| Left for distribution ----- | 2,175,400 |
| Eggs taken Camp Creek Station ----- | 2,181,600 |
| Eggs shipped to Wawona Hatchery ----- | 225,000 |
| Loss in eyeing and hatching ----- | 262,700 |
| Left for distribution ----- | 1,693,900 |
| Eggs taken Shovel Creek Station ----- | 1,370,000 |
| Loss in eyeing and hatching ----- | 177,800 |
| Fry planted in Shovel Creek ----- | 100,000 |
| Left for distribution ----- | 1,092,200 |
| Total ----- | 5,950,670 |

STEELHEAD TROUT.

| | |
|------------------------------------|---------|
| Eggs received from Brookdale ----- | 416,600 |
| Loss in hatching ----- | 55,600 |
| Left for distribution ----- | 361,000 |

LARGE LAKE TROUT—(*Salmo m. tahoensis*).

| | |
|--------------------------------|--------|
| Eggs received from Tahoe ----- | 92,922 |
| Loss in hatching ----- | 8,922 |
| Left for distribution ----- | 84,000 |

BLACK-SPOTTED TROUT—(*Salmo m. henshawii*).

| | |
|--------------------------------|---------|
| Eggs received from Tahoe ----- | 370,164 |
| Loss in hatching ----- | 51,664 |
| Left for distribution ----- | 318,500 |

SALMON.

The salmon output, while not so heavy as in several previous seasons brought many pleasing results. Several experiments have been made and some 50,000 fish were marked in endeavors to find the most favorable points for the distribution of these fish. After years of investigation I am of the opinion that the only successful way to rear salmon is to hold them from five to seven months and then release them in our rivers before the flood season. At this age they are able to escape their enemies and take care of themselves until they have reached the end of their long journey to the sea. By releasing them early, when the temperature in the streams first lowers, and before the flood season, they depart for their natural waters under most auspicious circumstances, and with no danger of being carried by the floods into the overflow basins and left later to perish in the tule basins when the flood waters have receded.

The Federal Bureau is making arrangements to take the eggs of the Silver salmon at Klamathon this year. They will be hatched at the Sisson hatchery.

The output of salmon follows:

| | |
|---------------------------------------------------------------|-----------|
| Eggs taken at Battle Creek Station and hatched at Sisson----- | 5,890,000 |
| Loss ----- | 105,145 |
| Left for distribution ----- | 5,784,855 |
| Hatched at Sacramento Experimental Station----- | 450,000 |
| Loss in shipping and hatching----- | 92,300 |
| Left for distribution ----- | 357,700 |

Following is a list of trout and grayling in the ponds at Sisson Station, November 1, 1912:

LOCII LEVEN.

| | |
|-------------------|--------|
| Adult ----- | 3,402 |
| Two year old----- | 3,572 |
| One year old----- | 10,500 |
| Fry ----- | 10,000 |
| | 27,474 |

EASTERN BROOK.

| | |
|-------------------|--------|
| Adult ----- | 4,078 |
| Two year old----- | 4,490 |
| One year old----- | 5,879 |
| Fry ----- | 17,500 |
| | 31,947 |

GOLDEN.

| | |
|-----------------|-----|
| Yearlings ----- | 250 |
|-----------------|-----|

GRAYLING.

| | |
|-----------|-------|
| Fry ----- | 4,000 |
|-----------|-------|

HYBRID GOLDEN-RAINBOW.

| | |
|-------------|----|
| Adult ----- | 57 |
|-------------|----|

RAINBOW.

| | |
|-------------------------|---------|
| Adult | 3,310 |
| One year old..... | 2,000 |
| Fry | 25,000 |
| Fry in Klink Lake..... | 50,000 |
| Fry in Sisson Lake..... | 75,000 |
| | <hr/> |
| | 155,310 |
| Total | 219,038 |

TAHOE HATCHERIES.

E. W. Hunt has successfully managed the hatcheries about Lake Tahoe for many seasons. He proceeded to the lake a little earlier than usual this year so as to be in readiness to take as many eggs as could possibly be accommodated at the Tahoe Hatcheries.

There has been a very large trout that entered some of the tributary streams of Tahoe to spawn. I believe these to be a different variety, if not a different species from the common black-spotted trout (*Salmo m. henshawii*) of Lake Tahoe. These large fish have never been artificially propagated, owing to the lateness of the season when spawning usually begins. It was my desire to procure a few thousand of these eggs and place the fry hatched from them in different waters to see if they attain the size and peculiar markings after they have come to maturity under different conditions that are attained in their native waters. These fish have been classified as the *Salmo tahoensis*.

Mr. Hunt succeeded in getting over half a million of their eggs. Of these 92,922 were shipped to Sisson and hatched, and have since been distributed to various waters. The remaining eggs at the Tahoe Hatcheries were hatched and distributed to various tributary streams of Lake Tahoe. I am waiting with a great deal of interest the results of the artificial hatching of these large trout and also the effects of transplanting them to foreign waters.

Another important feature in connection with the Tahoe work was the exchange of 50,000 rainbow trout eggs to the Verdi Hatchery in return for as many Eastern brook eggs. The Eastern brook eggs were hatched and at the age of eight months were in fine condition and were distributed. The rainbow eggs will be delivered to the Verdi Hatchery next spring.

After a very busy and successful season the Tahoe Hatchery closed on October 7th and Mr. Hunt, after a short vacation, proceeded to Sisson. The statistical report follows:

| | |
|------------------------------------------|-----------------|
| Black-spotted trout eggs taken..... | 3,610,622 |
| Large lake trout eggs taken..... | 542,761 |
| Total eggs taken..... | <hr/> 4,153,383 |
| Eggs shipped to Sisson and Wawona..... | 585,086 |
| Loss in eyeing and hatching..... | 482,439 |
| | <hr/> |
| | 1,067,525 |
| Fry planted as per distribution reports: | |
| From Tallac | 1,617,072 |
| From Tahoe | 993,137 |
| From Glen Alpine..... | 475,649 |
| | <hr/> |
| | 3,085,858 |
| Total..... | <hr/> 4,153,383 |

BROOKDALE HATCHERY.

The Brookdale Hatchery, which has hitherto been operated by Santa Cruz County, has recently been acquired by the State through a lease. Owing to a lack of funds for maintaining this hatchery, Santa Cruz County entered into an agreement with the State, turning over the station, in return for the delivery to that county annually of 500,000 steelhead trout eggs.

Mr. F. A. Shebley has managed this hatchery since its institution and has continued as its superintendent since it has been acquired by the State. The eggs which are hatched at Brookdale are taken mainly from Scott Creek. An insight into the history of this station is necessary, therefore, in order to fully understand the importance of what has been accomplished there.

Concrete dams were first placed in the creek in the fall of 1907 by Santa Cruz County at a cost of \$650.00. The following spring 725,000 eggs were taken. To make it a well equipped egg-collecting station considerable more work was needed; but an insurance of enough eggs in future had to be guaranteed in order to justify the cost. The only way to obtain this assurance was to protect the small trout in a portion of the stream and lagoon from hook and line fishermen. Leases were therefore secured from owners of land on that portion of the lagoon and stream, whereby four miles of stream was acquired and closed to fishermen. Here the fish are protected until maturity. Results have shown that by protecting that portion of the stream an increase of two million eggs was secured this season over the first season and with no greater cost of operation.

In addition to the importance to which he has elevated this plant as an egg collecting station, Mr. F. A. Shebley deserves great credit for the study and experiments he has pursued regarding fish life; they are instructive and interesting and represent a vast amount of well spent time and thought.

The egg-collecting station at Scott Creek was enlarged so as to take an extra number of steelhead eggs. Shipments of these eggs were made from Brookdale to the Ukiah Hatchery, to the Eel River Hatchery for distribution in Eel and Mad rivers and other nearby streams. Shipments were also made to Sisson for distribution by ear to Southern California waters. The remainder were kept at Brookdale for distribution to points in Santa Cruz County streams.

Further improvements will be necessary to increase the take of eggs this coming spring at Scott creek. The report of the season's work at Brookdale follows:

| | |
|-------------------------------------------------------------------|-----------|
| Total number eggs collected at Swanton, hatched at Brookdale..... | 2,709,300 |
| Loss | 603,200 |
| Left for distribution..... | 2,106,100 |
| Total number of eggs shipped to Ukiah Hatchery..... | 470,000 |
| Total number of eggs shipped to Price Creek Hatchery..... | 400,000 |
| Total number of eggs shipped to Sisson Hatchery..... | 416,600 |
| Two small lots to Sacramento Experimental Station..... | 16,000 |
| Fry planted Scott Creek..... | 50,000 |
| Fry planted Santa Cruz County..... | 753,500 |
| Total | 2,106,100 |

PRICE CREEK HATCHERY.

Mr. W. O. Fassett has continued in charge of the work at this important station and has directed it in an orderly, commendable manner; but a series of accidents have hampered the work here to a great extent.

In April a landslide damaged the flumes so much that the hatchery had to close. The eggs and embryo fish in the hatchery were planted in Price Creek. Several hundred dollars will be necessary to repair the water supply so badly damaged by the landslide.

It may be well to note that 100,000 salmon fry were liberated in Mad River this season. The people in this section were greatly pleased, claiming to have been entirely overlooked by former commissions. In response to a petition of the people of Arcata, a thorough study is being made of the conditions in Mad River relative to the propagation and distribution of salmon fry in that section. I believe that enough eggs can be taken to stock Eel River and Mad River, without planting there the eggs of the Sacramento River.

The report of the steelhead trout eggs taken and the early distribution on account of the landslide follows:

| | |
|-----------------------------------------------------|-----------|
| Eggs taken ----- | 218,000 |
| Eggs received from Brookdale Hatchery ----- | 400,000 |
| <hr/> | |
| Total ----- | 618,000 |
| Loss in eyeing and hatching ----- | 38,000 |
| <hr/> | |
| | 580,000 |
| Planted in Price creek: | |
| Embryos ----- | 454,000 |
| Eyed eggs ----- | 80,000 |
| Uneyed eggs ----- | 46,000 |
| <hr/> | |
| Total planted ----- | 580,000 |
| <hr/> | |
| Salmon eggs received from Bureau of Fisheries ----- | 3,240,000 |
| Loss ----- | 36,340 |
| <hr/> | |
| Left for distribution ----- | 3,203,660 |
| Distributed in Mad River ----- | 100,000 |
| Distributed in Eel River ----- | 3,103,660 |
| <hr/> | |
| Total ----- | 3,203,660 |

UKIAH HATCHERY.

As in several previous years, the work at Ukiah has been very capably handled by Mr. A. V. La Motte. The hatchery was repaired early in the season, and a motor was installed for a pumping plant, to insure a supply of water in case the supply in the creek should fail. The expense of purchasing the pump and wire for the power line transmitting the current to the motor was paid for by subscription by the citizens of Ukiah. The fish have suffered at this hatchery in former years on account of the failure of the water supply. The present season, however, has brought with it an ample supply of water, and the station has operated successfully for four months.

The work at this station, while not so extensive as at some of the other stations, is a credit to the Commission; Mr. La Motte deserves unstinted praise for the businesslike and creditable manner in which he has conducted the work and made his reports. The residents of this section are also entitled to the gratitude of the Commission for their generous coöperation and support.

The egg-collecting station on Eel River, Mendocino County, was not opened this season. The Marin County Trout Farm demanded 600,000 eggs for permitting the Commission to operate at the Snow Mountain Power Company dam, on which they hold a lease. The Commission considered the demand unjust and that granting it would be favoring private interests, so enough eggs were shipped to Ukiah from Brookdale to supply the streams in that section.

The following briefly sums up the output of this station:

| | |
|--------------------------------------------------------------|---------|
| Steelhead eggs shipped to Ukiah from Brookdale Hatchery..... | 470,000 |
| Loss of eggs and fry | 36,542 |
| | <hr/> |
| Left for distribution..... | 433,458 |

WAWONA HATCHERY.

The work at the Wawona Hatchery, superintended by Mr. F. C. Boyce, has been entirely satisfactory, and like that at all the other hatcheries, the season has been a busy one.

The eggs shipped to this station from the Sisson and Tahoe hatcheries hatched in good condition, and the fry were vigorous and healthy. Through the courtesy of Major W. H. Forsyth, superintendent of the Yosemite National Park, the fish were given a wide distribution through the Yosemite National Park and adjacent country during the month of July. The greater portion were distributed by pack animals in the lakes and streams of the Yosemite region.

The following report sums up the season's work at the Wawona Hatchery:

| | |
|------------------------------------------------------------|---------|
| Rainbow eggs shipped from Sisson to Wawona..... | 225,000 |
| Loss in hatching and rearing..... | 8,994 |
| | <hr/> |
| Left for distribution..... | 216,006 |
| Black-spotted trout eggs shipped from Tahoe to Wawona..... | 122,000 |
| Loss in hatching and rearing..... | 7,534 |
| | <hr/> |
| Left for distribution..... | 114,466 |
| | <hr/> |
| | 330,472 |
| Rainbow trout fry distributed..... | 216,006 |
| Black-spotted trout fry distributed..... | 114,466 |
| | <hr/> |
| Total distributed | 330,472 |

THE SACRAMENTO EXPERIMENTAL STATION.

During the fall of 1911 the Commission decided to carry on a series of experiments to determine whether the eggs of the quinnat salmon could be successfully hatched and the fry reared near the city of Sacramento. It was thought that if water could be found in which the eggs could be hatched without causing injury to the eggs and embryos, that a greater percentage of the fry would safely reach the ocean, than would be the case if they were all liberated in the upper reaches of the river near the natural spawning grounds. It was maintained that under the old system of liberating the fry as soon as they were able to swim, that a great many of them were devoured by predatory fishes, and others were carried into the overflow basins during years of flood.

Accordingly, the station at Sacramento was established. Mr. F. A. Shebley conducted the work in addition to his duties as superintendent of the Brookdale Hatchery. The experiments as carried on at Sacramento are of vital importance to the salmon industry. After experimenting with the water from a number of wells, a flow of water was found on the Sherburn tract that appeared to give average results in hatching. The fish hatched at this station were all released in the Sacramento River. Of these, 50,000 were marked. A close watch will be kept for the return of these fish when they return at maturity, to find out if a greater percentage return as mature salmon than those that are released on the upper reaches of the Sacramento River.

Nearly all of the fry that were liberated in the Sacramento River were floated in a screen cage by boat into the middle of the stream and there released. Mr. N. B. Seofield, however, took 500 in a floating box down the river, where they were held and fed for several weeks in brackish and salt water. They were not affected by the sudden change from fresh to brackish and then to the saline waters of the straits near the outlet of the bay. Mr. Seofield, who conducted the experiment, will furnish a report of the minor details of this work.

In order to accurately determine whether better results are obtained by hatching and releasing the fry nearer tidewater than are obtained under the old system, it will be necessary to operate this station for a number of years. A certain number of fry will be marked each year until conclusive results are obtained.

In the course of the experiments above mentioned and in the search for suitable water for hatching purposes, two wells were bored, and the water from other wells was also analysed and experimented with. The batteries or series of troughs used in these experiments were set up in the open near the wells and the pumping plants were installed temporarily. The best results were obtained from the well on the Sherburn tract. Here a battery of 40 troughs was set up on the levee, and the pumping plant installed in a small building of corrugated iron. As the work continues during the coming season it will be necessary that a tent or temporary building be erected over the hatching battery, and I respectfully recommend that these few improvements be made in order

that the employees may be protected from the inclemencies of the weather. If the experiments of the coming seasons prove successful, then a permanent station should be erected and the work carried on extensively. A report of the eggs hatched and released follows:

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Total number of eggs received from U. S. Commission, Baird, Battle Creek and Mill Creek..... | 1,768,000 |
| October 9—First experiment, eggs placed in experimental trough, Carmichael land; water being unfit. Loss..... | 50,000 |
| October 21—Second experiment. Ohji well, 10,000 eyed eggs, 11,000 green eggs. Both lots hatched in good condition, making fine growth after feeding..... | 21,000 |
| January 6—Third experiment. Levee well, water unfit. Poor results..... | 200,000 |
| January 10—Fourth experiment. Used river water by pump. No results..... | 50,000 |
| January 26—Reshipped to Sisson..... | 450,000 |
| January 26—Loss in hatching and rearing balance of eggs with water taken from Ohji well..... | 97,000 |
| January 26—Fry liberated in Sacramento River..... | 900,000 |
| | 1,768,000 |

MILL CREEK.

This station is the property of the Federal Bureau, but it was operated this year by the California Commission. Heretofore, the salmon eggs have been hatched largely at Sisson, and as the prospects were unusually promising for the season passed, it was feared the capacity of the Sisson Hatchery would be overtaxed. Accordingly, arrangements were made with the Federal Bureau whereby the State operated the Mill Creek Station. This station has many fine features, and is ideally situated for the hatching of salmon fry. Below the mill there is a mill-race 25 x 30 and containing from 3,000 to 5,000 miners' inches of water. It is covered with medium-sized boulders and gravel, and here were distributed the surplus embryos and later the fry. It has proved to be a remarkably fine nursery.

Geo. L. Hopper has been in charge of the work at this station, and he has submitted the following report of the season's work:

| | |
|----------------------------------------|-----------|
| Eggs turned over to the State..... | 9,364,550 |
| Loss..... | 40,660 |
| | 9,323,890 |
| Eggs shipped to Sacramento..... | 607,000 |
| | 8,716,890 |
| Fry hatched at Mill Creek Station..... | 8,716,890 |
| Fry lost..... | 53,660 |
| | 8,663,230 |
| Fry planted at Mill Creek..... | 8,663,230 |

In addition, there were 11,000 green eggs delivered to Mr. Hunt before the State assumed charge of the operations here. There were also 150,000 eggs sent to Sacramento from Baird.

THE DISTRIBUTION SEASON.

The season of distribution has been a long one. The first shipments were of salmon fry and were made in March (1912). Since then the car and its crew under the management of F. McCrea, have been kept constantly on the move, with the exception of ten days in April, when the car was in the shops.

In August the water in the coast streams and southern California became so extremely low that trout distribution had to be discontinued for a time. The car crew then proceeded to collect and distribute black bass. This work was not altogether easy, but they managed to gather 1,750 of these fish. They were planted mostly in interior waters south of San Francisco, but there was one shipment each to Placer, Yolo, and Calaveras counties.

I have submitted to the Commission for publication, a complete tabulated list of all the fish distributed from Sisson Hatchery and the other hatcheries, and it will appear elsewhere in the biennial report. This I deem most important, because the people are not only interested in knowing how many fish are propagated and distributed, but they also want to know where they are planted. The list will satisfy all of these interested persons and will prove that the Commission is endeavoring to scatter its benefits equally amongst all sections of the State.

In a very general way this report covers the work at Sisson Hatchery and its auxiliary stations.

SCREENS AND LADDERS.

Acting under the instructions of your honorable Board, I began early in May, work on the fish "ladder" and screen investigation and the work of having necessary structures and appliances installed.

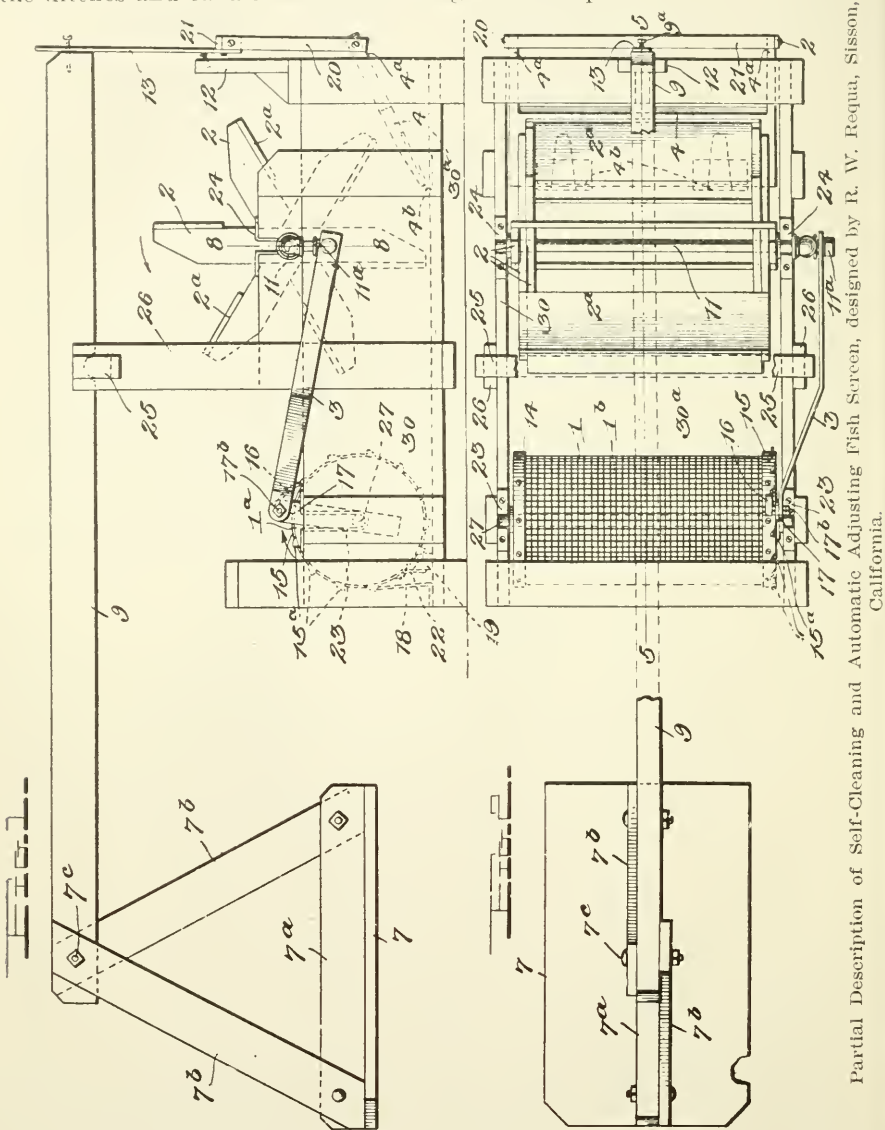
On my recommendation you appointed A. E. Doney as my assistant in the "ladder" and screen investigation. Mr. Doney has had several years of experience in the Klamath River work besides his duties as deputy in the northern part of the State. He has made a special study of the "ladder" work and has proven to be a valuable assistant.

We have visited most of the corporations, mill owners, irrigation and land companies and other water users, from Siskiyou to San Diego, in every county but two, and will have visited these two before this report is issued. On most occasions I have found them courteous and willing to install whatever screens or ladders were necessary.

There has been a screen law in California nearly twenty years and this is the first Commission that has insisted on its enforcement. The work in this line therefore has necessarily been slow. What has been neglected and lying dormant for so long can not be corrected in a month or even in a year.

It has been claimed by many who are familiar with the screen question, that the use of screens with meshes small enough to exclude trout fry would, in many cases, practically shut off all the water from the

ditch or canal in which fry were placed. After a careful study of hundreds of ditches and canals and the matter that is carried into them, in the form of algae, leaves and grasses, and floating material generally, I am firmly convinced that the parallel bar screens can be placed in all the ditches and canals without working a hardship or inconvenience on



Partial Description of Self-Cleaning and Automatic Adjusting Fish Screen, designed by R. W. Requa, Sisson, California.

any person or company. When we first began this work we recommended the parallel bar screen and any of the rotary screens that the ditch owners desired to put in, so long as the meshes met the regulations of one quarter of an inch. Since then several engineers have planned

automatic self-cleaning parallel bar screens that can be installed successfully in any of the canals no matter how wide or deep they are.

Practical experiments have been made by Superintendent Requa at the Sisson Hatchery and he now has in operation there, two working models of self-cleaning rotary screens. He himself is the inventor of one, and he is entitled to the credit of making the best rotary screen that has ever been devised. Its most important feature is its absolute simplicity and inexpensiveness. It is so constructed that any farmer could make one in his work shop in half a day. I have neither the time nor the space to take up more fully the minute details of this screen. It is my intention to circulate information on this subject by separate folders.

This screen is designed for use in irrigating ditches, canals, or pipes taking water from streams, reservoirs, or other bodies of water.

The purpose of this invention is to provide a fish screen of simple construction, equipped with an automatic regulating device which will maintain a mean water level on the face of the screen under variable heads of water. The driving apparatus, including a crank shaft, pawl and ratchet members, is designed for construction without special tools and at a nominal cost.

It may be well to add here that the regulation insisted upon requires that streams inhabited by trout, salmon, shad, and striped bass require screens with openings not greater than one fourth of an inch. In streams frequented by black bass, Sacramento perch and California "pike," and where there are no salmon, shad, trout, or striped bass to protect, an opening of one half an inch square is permissible.

I have found that the reluctance in screening is more with the engineers, superintendents or water masters, than the directors or real owners in land companies. Notice has been served to all water users that the law will be enforced. When a reasonable length of time has elapsed and no intention is shown to comply with the law, I shall request your honorable Board to instruct the Commission's attorney to begin proceedings to compel the obstinate ones to comply with the law.

In our study of the "ladder" question we are finding that most of the opposition to the construction of efficient fish "ladders" is not on account of the expense entailed in construction. In many instances, and particularly is it the case with large power companies, non-compliance is because they do not want to allow sufficient water to pass through the ladders to make them operative, so as to support and preserve the fish life in the streams below the plants. Several companies were public spirited and made it a rule to allow sufficient water to pass through their dams to keep the fish in good condition during the period of the minimum flow of water in the streams.

This work of the inspection and installing of "ladders" and screens will be most energetically pursued in the future, and I believe that another year will see satisfactory progress in this line.

EXPERIMENTS ON TRUCKEE RIVER.

Mr. F. A. Shebley and Mr. N. B. Scofield began a series of practical experiments on the Truckee River during the latter part of September, to determine if the refuse that passes into the river from the Crown Pulp and Paper Mill at Floriston is injurious to trout eggs and fry. The eggs and fry are being studied above and below the mill but the experiments have not yet been completed. A careful record is being kept of all the experiments, and so far the results of the experiments have been very conclusive. When the experiments are finished a full report of the results will be sent to your honorable Board.

RECOMMENDATIONS.

Besides the suggestions and recommendations that have already been made in this report, there are a few more that I deem it advisable to give at this time. They relate to the inauguration of a sea coast patrol boat, a southern California hatchery, discontinuance of planting eggs taken from the Sacramento River in other rivers, a general increase of hatchery work and a warning concerning the introduction of foreign fish.

SEA COAST PATROL BOAT.

On my trips of inspection in the southern coast counties, I interviewed a number of the more prominent fishermen, citizens interested in the preservation of the marine fishes, and the deputies in the seaboard counties, and from what I could learn regarding the condition from Monterey south, I am of the opinion that the Commission should have a motor boat for the sea coast patrol; a seaworthy boat that could stand the rough weather, so that the deputies could visit any of the islands from San Miguel Island south to Coronado Island. I believe that this is a very important measure for your honorable Board to consider, and I respectfully recommend that you give this your early and earnest consideration, so that the necessary recommendation can be made to the legislature for an appropriation to purchase a good seaworthy patrol motor boat to be used in the coast and island patrol.

SOUTHERN CALIFORNIA HATCHERY.

In my March report I recommended that the Commission investigate conditions in southern California, with a view to establishing a small hatchery in that end of the State. Pursuant to this recommendation, in company with Mr. E. W. Hunt, I made a trip in October through the southern California coast counties lying south of the Tehachapi Mountains. We examined a number of important sites and made a careful study of them to determine which was the best suited for the location of a hatchery to supply the southern California streams with trout fry. We found the San Antonio cañon in Los Angeles County to be the most favorable. At this site there is an abundance of pure water, free from algæ, organic matter, or any form of harmful bacteria or other deleterious matter. The site is just above the intake of the Sierra Power Company's pipe line in San Antonio cañon, on the south

basal slope of Mount San Antonio. From the end of the electric car line to the hatchery site is six and one half miles of good road, over which a team or auto truck can convey the fish to the ears without difficulty. We were informed that the State could secure the hatchery site and the water necessary to operate the hatchery at a nominal sum. A lease for at least twenty-five years or a water right or deed for 40 inches of water and two acres of land would be necessary. We shall endeavor to get an option on this site and a statement of the amount asked for the land and water rights. If the same can be had at a reasonable figure, I would respectfully recommend that an appropriation be asked of the next legislature for the purchase of the site or a lease of same, as well as for the construction of the hatchery, pipe line, dam, cottage, and for the purchase of an auto truck.

This proposition is an important one. The rapidly increasing population of the southern part of the State makes it necessary to distribute a greater number of fry in that section each year, and the most economical way of doing it is to establish a hatchery there.

INCREASE OF HATCHERY WORK.

With the rapidly increasing population of California, I believe that proportionate increase should be made in the hatchery work, so that a larger number of fish can be liberated each season to meet the demands of the increasing population. Several varieties of food and game fishes from the eastern states should be introduced, as I have recommended in my monthly reports to the Board.

DANGER IN INTRODUCTION OF PREDATORY FISH.

I wish to call the attention of your honorable Board and the legislature to the danger of allowing any of the more predatory fishes from the eastern waters to be introduced into this State. I would respectfully recommend that the legislature make it a misdemeanor for any person, company or corporation to introduce, carry, transplant, distribute, or ship into the State of California any live fish or fish eggs without first having obtained a permit in writing from the Board of Fish and Game Commissioners. A number of persons have recently asked the Commission for some of the more predatory fishes to be placed in the waters of our own State. They mean to be interested and progressive and do not realize the great damage that can be done by introducing undesirable species. In my opinion a strict law should be passed covering the subject so that no one will ever be allowed to introduce species that would be injurious and probably exterminate the valuable food fishes that we already have and are endeavoring to propagate in future.

WITHDRAWING SALMON EGGS FROM THE SACRAMENTO RIVER.

I mentioned in the report on the Price Creek Hatchery, that I believe sufficient eggs can be taken from Eel River and Mad River to stock those rivers. Heretofore these rivers have been stocked with eggs from the Sacramento River. I believe that this should not be continued and

I think that the Commission should recommend that the Federal Bureau discontinue this work. The Sacramento is far too important a river commercially to have its supply of salmon eggs depleted by transplanting to other streams.

Following the general increase of the hatchery work I would recommend that the propagation of striped bass be taken up again. In my opinion, if skilled fish culturists with modern apparatus take up this very important work, practical results can be obtained, and the numbers of this valuable food and game fish can be greatly increased. The legislature should appropriate a special fund for this work, as it is of great economic value to the people.

We now have several thousand grayling fry in our ponds at Sisson Hatchery that we are rearing for breeders. We hope to be able to get enough breeders from these fry to give us a start, so that we can collect and hatch the eggs of this gamey fish for our mountain lakes and streams.

One of the more important improvements in the hatchery work would be the construction of a new and modern hatchery at Tahoe City. The old hatchery was erected in 1889. The building is old and out of date and too small to accommodate the number of eggs and fry that must be handled at this station to obtain good results in stocking the numerous lakes and streams in the Tahoe district. I would respectfully recommend that a special appropriation for this purpose be made by the next legislature if they wish to keep up and increase the work at this important station.

CONCLUSION.

This concludes my brief report of the work done at each of the hatcheries and their numerous substations. Generally speaking I believe it has been the most progressive year in the history of the Commission, more productive of good results and replete with every assurance of just as good if not better prospects ahead.

In the beginning of this report I expressed my deep gratitude to the members of the Commission for their very generous coöperation and support. I thoroughly appreciate the assistance of my superiors, but I must not overlook those over whom I have had general supervision. They have given to the Commission the best service possible at all times, working night and day when necessary, each performing his work and filling his own particular duty to the best of his ability. The hearty coöperation of my superiors and the competent assistance of the employees of this department have made this year the fruitful, progressive year it has been.

Respectfully submitted.

W. H. SHEBLEY,
Superintendent of Hatcheries.

November 1, 1912.

PART II—STATISTICAL.

CALIFORNIA FISH AND GAME COMMISSION ADMINISTRATIVE DISTRICTS.

San Francisco District.

Alameda County.
 Contra Costa County.
 Del Norte County.
 Humboldt County.
 Lake County.

Marin County.
 Mendocino County.
 Monterey County.
 San Benito County.
 San Francisco County.

San Mateo County.
 Santa Clara County.
 Santa Cruz County.
 Sonoma County.

Sacramento District.

Alpine County.
 Amador County.
 Butte County.
 Calaveras County.
 Colusa County.
 El Dorado County.
 Glenn County.
 Lassen County.

Modoc County.
 Napa County.
 Nevada County.
 Placer County.
 Plumas County.
 Sacramento County.
 San Joaquin County.
 Shasta County.

Sierra County.
 Siskiyou County.
 Solano County.
 Sutter County.
 Tehama County.
 Trinity County.
 Yuba County.
 Yolo County.

Los Angeles District.

Imperial County.
 Inyo County.
 Los Angeles County.
 Mono County.

Orange County.
 Riverside County.
 San Bernardino County.
 San Diego County.

San Luis Obispo County.
 Santa Barbara County.
 Ventura County.

Fresno District.

Fresno County.
 Kern County.
 Kings County.

Madera County.
 Mariposa County.
 Merced County.

Stanislaus County.
 Tuolumne County.
 Tulare County.

BOARD OF FISH AND GAME COMMISSIONERS.

Roster, January 1, 1913.

Commissioners appointed by the Governor, by and with the consent of the Senate.
Term at pleasure of the Governor. No pay.

Stats. 1869-70, p. 663; Pol. Code, Secs. 368, 642, 643.

| | |
|----------------------------------------------------|---------------------------------------|
| F. M. Newbert, <i>President</i> , Sacramento | Appointed Aug. 3, 1911 |
| M. J. Connell, Los Angeles | Appointed Feb. 1, 1909 |
| Carl Westerfeld, San Francisco | Appointed Nov. 28, 1911 |
| Ernest Schaeffle, <i>Secretary</i> , San Francisco | Appointed Nov. 29, 1911 |
| J. S. Hunter | Assistant in Charge Game Conservation |
| W. H. Shebley | Superintendent of Hatcheries |
| J. H. Hoerl | Clerk to Superintendent of Hatcheries |
| R. D. Duke | Attorney |

Head Office, San Francisco (33 Mills Building).

Under direction of Commissioner Carl Westerfeld.

| | | | |
|---------------------|---------------------|----------------|--------------|
| Ernest Schaeffle | Secretary | H. R. Dunbar | Clerk |
| Arthur M. Fairfield | Assistant Secretary | E. McI. Rutter | Clerk |
| O. H. Reichling | Cashier | Mae D. Horn | Stenographer |
| Leo N. Pettit | Record Clerk | M. O. Vreeland | Stenographer |

Los Angeles Office (510 Consolidated Realty Building).

Under direction of Commissioner M. J. Connell.

| | | | |
|-----------------|-----------|-------------|------------------------|
| H. I. Pritchard | Assistant | E. A. McKee | Clerk and Stenographer |
|-----------------|-----------|-------------|------------------------|

Fresno Office (347 Forsyth Building).

Under direction of Deputy A. D. Ferguson.

| | |
|----------------|--------------|
| Lida H. Ransom | Stenographer |
|----------------|--------------|

Sacramento Office (Forum Building).

Under direction of Commissioner F. M. Newbert.

| | | | |
|------------|-----------|--------------|------------------------|
| Geo. Neale | Assistant | R. E. Cannel | Clerk and Stenographer |
|------------|-----------|--------------|------------------------|

List of Regular Deputies, San Francisco District.

Alameda County.

| | |
|-----------------|------------|
| J. L. Bundock | Oakland |
| Earle Downing | Pleasanton |
| Amos O. Stinson | Alameda |

De Norte County.

| | |
|------------|-------|
| Paul Smith | Requa |
|------------|-------|

Humboldt County.

| | |
|----------------|---------|
| Earl P. Barnes | Eureka |
| Theo. Benson | Fortuna |

Mendocino County.

| | |
|--------------|-------------|
| Wm. Ray | Laytonville |
| B. H. Miller | Ukiah |

Marin County.

| | |
|-------------------|------------|
| Sheridan G. Smith | Bolinas |
| Vernon D. Thomas | San Rafael |
| Herbert E. Foster | San Rafael |

Monterey County.

| | |
|--------------|---------------|
| Phil H. Oyer | Pacific Grove |
| Frank Shook | Salinas |

| | | |
|--------------------------|---------------------------------|-----------------------|
| J. H. Hill | <i>Santa Cruz County.</i> | Watsonville |
| I. L. Koppel | <i>Santa Clara County.</i> | San José |
| Frank H. Smith | <i>San Mateo County.</i> | Half Moon Bay |
| M. S. Clark | <i>San Francisco County.</i> | San Francisco |
| Ray B. Heacock | | San Francisco |
| A. F. Lea | <i>Sonoma County.</i> | Cloverdale |
| Henry Lencioni | | Santa Rosa |
| H. B. Nidever, Captain | <i>Patrol Launch "Quinnat."</i> | Headquarters, Vallejo |
| J. Christenson, Engineer | | |

Los Angeles District.

| | | |
|-------------------|-------------------------------|----------------|
| E. H. Ober | <i>Inyo County.</i> | Bishop |
| F. A. Forster | <i>Orange County.</i> | Capistrano |
| Jas. H. Gyger | <i>Riverside County.</i> | Perris |
| I. A. Bordner | <i>Los Angeles County.</i> | Long Beach |
| H. J. Abels | <i>Santa Barbara County.</i> | Santa Maria |
| Jas. A. Vale | <i>San Bernardino County.</i> | San Bernardino |
| Webb Toms | <i>San Diego County.</i> | San Diego |
| Jas. A. Rasmussen | <i>Ventura County.</i> | Ventura |

Fresno District.

| | | |
|----------------|---------------------------|--------------|
| Tipton Mathews | <i>Kern County.</i> | Wasco |
| S. L. N. Ellis | <i>Fresno County.</i> | Fresno |
| F. A. Bullard | | Dunlap |
| J. E. Newsome | <i>Stanislaus County.</i> | Newman |
| R. E. Shepherd | | Merced |
| E. W. Smalley | <i>Tulare County.</i> | Hanford |
| D. H. Hoen | | Visalia |
| W. G. Scott | <i>Tuolumne County.</i> | Soulsbyville |

Sacramento District.

| | | |
|------------------|--------------------------|--------------|
| Fred Werner | <i>Amador County.</i> | Sutter Creek |
| David E. Roberts | <i>Calaveras County.</i> | Murphys |
| S. J. Carpenter | <i>Colusa County.</i> | Maxwell |
| Euell Gray | <i>El Dorado County.</i> | Shingle |

| | | |
|---------------------|----------------------------|--------------|
| | <i>Lassen County.</i> | |
| Frank P. Cady | ----- | Susanville |
| | <i>Napa County.</i> | |
| Wm. J. Moore | ----- | Napa |
| | <i>Modoc County.</i> | |
| John Todd Bonner | ----- | Alturas |
| Geo. W. Courtwright | ----- | Straw |
| | <i>Nevada County.</i> | |
| R. C. O'Connor | ----- | Grass Valley |
| | <i>Placer County.</i> | |
| S. J. Mandeville | ----- | Truckee |
| C. A. Scroggs | ----- | Loomis |
| | <i>Plumas County.</i> | |
| Geo. W. Chamberlin | ----- | Quincy |
| | <i>Sacramento County.</i> | |
| Wm. J. Green | ----- | Sacramento |
| C. H. Blemer | ----- | Sacramento |
| | <i>Siskiyou County.</i> | |
| Frank S. Parke | ----- | Yreka |
| | <i>Solano County.</i> | |
| Wm. H. Armstrong | ----- | Vallejo |
| | <i>San Joaquin County.</i> | |
| Richard Squire | ----- | Lodi |
| George J. Merritt | ----- | Stockton |
| | <i>Shasta County.</i> | |
| J. S. White | ----- | Castella |
| | <i>Trinity County.</i> | |
| G. O. Laws | ----- | Weaverville |
| | <i>Tchama County.</i> | |
| T. W. Birmingham | ----- | Red Bluff |
| | <i>Yolo County.</i> | |
| R. L. Sinkey | ----- | Woodland |
| E. E. Wilgus | ----- | Winters |

Special Investigators, Game Farm and Hatchery Employees.

| | | |
|---------------------------------------------------|-------------------------------|--------------------------|
| | <i>Special Investigators.</i> | |
| Harold Heath (Mollusks) | ----- | Stanford University |
| N. B. Scofield (Salmon and Fishery Methods) | ----- | Sunnyvale |
| F. W. Weymouth (Crabs) | ----- | Stanford University |
| Willard E. Kay (Crabs) | ----- | Stanford University |
| H. C. Bryant (Game and Non-Game Birds) | ----- | University of California |
| Chas. L. Edwards (Abalone) | ----- | Los Angeles |
| Gretchen L. Libby, Educational Assistant | ----- | Riverside |
| Frank C. Clarke (Deer and Other Game Animals) | ----- | University of California |
| R. W. Requa, Assistant in Fishway and Screen Work | ----- | Sisson |
| A. E. Doney, Assistant in Fishway and Screen Work | ----- | Sisson |
| Chas. L. Gilmore, In Charge Stream Survey | ----- | Sacramento |

Hayward Game Farm.

| | | |
|--------------|-------|----------------|
| W. N. Dirks | ----- | Superintendent |
| David Fontes | ----- | Assistant |

Fish Hatchery Employees.

| | | |
|-------------------|-------------------------|-----------------|
| | <i>Sisson Hatchery.</i> | |
| E. W. Hunt | ----- | Superintendent |
| F. McCrea | ----- | Foreman |
| E. V. Cassell | ----- | Assistant |
| C. Nixon | ----- | Inside Foreman |
| P. Sullaway | ----- | Outside Foreman |
| F. Clessens | ----- | Assistant |
| J. McManus | ----- | Assistant |
| Geo. McCloud, Jr. | ----- | Assistant |
| E. Clessens | ----- | Assistant |
| J. E. Wincomb | ----- | Assistant |
| R. I. Bassler | ----- | Assistant |
| Wm. Hefferman | ----- | Assistant |

Brookdale Hatchery.

F. A. Shebley.....Superintendent
H. L. Nelf.....Assistant

Swanton Egg Collecting Station, Scott Creek.

W. H. Rich.....Deputy in Charge

Grizzly Bluff Hatchery, Eel River.

W. O. Fassett.....Superintendent
N. F. Sisson.....Assistant

Sacramento Experimental Salmon Station.

M. L. Cross.....Superintendent
Geo. A. West.....Assistant
Wm. Rogers.....Assistant

INVENTORY OF STATE PROPERTY IN CHARGE OF FISH AND GAME COMMISSION.

Recapitulation Statement, June 30, 1912.

| | | |
|---------------------------------------|------------|------------|
| Office equipment, San Francisco | \$2,204 05 | |
| Office equipment, Sacramento | 609 60 | |
| Office equipment, Fresno | 594 50 | |
| Office equipment, Los Angeles | 579 60 | |
| | | \$3,987 75 |

Hatcheries.

| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Sisson Hatchery, including fish distribution car and equipment, cottage at Sisson, Shasta River Station, Shovel Creek Sta- tion, Bogus Creek Station, Camp Creek, material at Terry and at Thrall..... | \$41,264 35 | |
| Tahoe Hatchery | 4,768 70 | |
| Tallac Hatchery and cottage..... | 4,823 10 | |
| Tallac Spawning Station, cottage and cabin..... | 680 79 | |
| Glen Alpine Hatchery..... | 36 05 | |
| Scott Creek (Santa Cruz County)..... | 1,218 80 | |
| Price Creek Hatchery (Humboldt County)..... | 2,840 55 | |
| Sacramento Experimental Station | 580 49 | |
| Wawona Hatchery | 86 00 | |
| Ukiah Hatchery | 83 65 | |
| Bouldin Island Hatchery (stored, South End Warehouse).... | 125 00 | |
| | | 56,507 48 |

Launches.

| | | |
|------------------------------|------------|----------|
| "Quinnat" and equipment..... | \$5,712 90 | |
| "Shad" and equipment..... | 1,174 60 | |
| "Audubon" and equipment..... | 740 75 | |
| | | 7,628 25 |

State Game Farm.

| | | |
|----------------------------------------|------------|-----------|
| Equipment, cottage and tank house..... | \$9,251 94 | |
| Game birds and animals..... | 2,242 63 | |
| | | 11,494 57 |

Miscellaneous.

| | | |
|-------------------------------------------------------|----------|--|
| State property in charge of Commission employees..... | 1,658 79 | |
| Collecting nets stored at Vallejo..... | 126 00 | |

| | | |
|-------------|--|-------------|
| Total | | \$81,402 84 |
|-------------|--|-------------|

REVENUES AND EXPENDITURES.

The following financial statement shows concisely and fully the sources and amounts of the funds coming into the Board's control since the filing of the last biennial report, with the channels and amounts of expenditures:

| | | |
|-------------------------------------------------------------------------------------|------------------|--------------|
| Balance on hand June 30, 1910----- | | \$73,318 21 |
| | <i>Receipts.</i> | |
| Sale of hunting licenses, 1910-1911----- | \$143,265 00 | |
| Sale of hunting licenses, 1911-1912----- | 146,181 00 | |
| | | \$289,446 00 |
| Sale of commercial fishing licenses, 1910-1911----- | \$23,595 00 | |
| Sale of commercial fishing licenses, 1911-1912----- | 23,545 00 | |
| | | 47,140 00 |
| Sale of wholesale fish and game dealers' licenses, 1911-1912----- | | 1,265 00 |
| Fines paid into state treasury for violations of fish and game laws, 1910-1911----- | \$15,941 30 | |
| Fines paid into state treasury for violations of fish and game laws, 1911-1912----- | 19,530 13 | |
| | | 35,471 43 |
| Sale of game and produce from Game Farm----- | | 2,097 80 |
| Total----- | | \$375,422 23 |

Disbursements, Year 1910-1911.

| | |
|--------------------------------------------------------------------------------------------------|--------------|
| San Francisco District—Salaries, traveling expenses, rentals, etc.----- | \$86,803 60 |
| Los Angeles District—Salaries, traveling expenses, rentals, etc.----- | 16,407 40 |
| Fresno District—Salaries, traveling expenses, rentals, etc.----- | 14,145 85 |
| Game Farm—Salaries, expenses, supplies, purchase of birds, etc.----- | 10,805 64 |
| Hatcheries and spawning stations—Salaries, traveling expenses, supplies | 30,611 32 |
| Distribution of fish (by car)—Salaries, expenses, supplies, etc.----- | 4,802 61 |
| Fish patrol (launches)—Salaries, expenses, supplies, etc.----- | 12,811 02 |
| Scientific investigations and publicity relating thereto—Salaries, expenses, supplies, etc.----- | 5,814 58 |
| Prosecutions and fees----- | 7,492 35 |
| Commissions on sale of hunting licenses and refunds----- | 12,586 43 |
| Bounties on California lions----- | 5,420 00 |
| Total----- | \$207,770 80 |

NOTE.—During the year 1910-11 the San Francisco District included the counties now forming the Sacramento District.

Disbursements, 1911-1912.

| | |
|--------------------------------------------------------------------------------------------------|--------------|
| San Francisco District—Salaries, traveling expenses, rentals, etc.----- | \$49,885 54 |
| Sacramento District—Salaries, traveling expenses, rentals, etc.----- | 35,700 39 |
| Los Angeles District—Salaries, traveling expenses, rentals, etc.----- | 18,555 38 |
| Fresno District—Salaries traveling expenses, rentals, etc.----- | 21,390 68 |
| Game Farm—Salaries, expenses, supplies, purchase of birds, etc.----- | 8,228 84 |
| Hatcheries and spawning stations—Salaries, traveling expenses, supplies, etc.----- | 40,998 09 |
| Distribution of fish (by car)—Salaries, expenses, supplies, etc.----- | 5,561 58 |
| Fish patrol (launches)—Salaries, expenses, supplies, etc.----- | 6,046 01 |
| Scientific investigations and publicity relating thereto—Salaries, expenses, supplies, etc.----- | 8,806 65 |
| Prosecutions and fees----- | 9,245 37 |
| Commissions on sale of hunting and fishing licenses and refunds----- | 13,161 40 |
| Bounties on California lions----- | 5,680 00 |
| Miscellaneous charges----- | 6,910 46 |
| Total----- | \$230,170 39 |
| June 30, 1912, balance in state treasury, after June bills were paid---- | 32,634 68 |

(It is impossible to reconcile statement of license sales and other revenues for any year with statement of payments into and balances of state treasury, as collections are not all made during same fiscal year.)

It should be explained that an appropriation of \$20,000.00 yearly for the support and maintenance of hatcheries, which was available up to June 30, 1910, has not been received since that time. In consequence of this loss, the fish cultural work of the Board has been seriously interfered with and will be more greatly impeded and injured within the next two years if the appropriation is not restored and in increased amount.

As the foregoing statement shows, the Board's receipts from all direct fishery sources—that is, from the sale of commercial fishing licenses and fines for the violation of fish laws—amounts to only \$60,000.00 in round numbers for the biennial term. This amount is entirely insufficient to maintain the fish work of the State on a proper plane and can not properly be increased by diversions from the revenues derived from game and hunting sources.

According to Dr. T. S. Palmer, assistant chief of the U. S. Biological Survey, a Californian and recognized by competent authorities as being one of the foremost game conservationists of the world, this State presents a problem that is not faced by the fish and game commissions of any other state. The problem is unusual and great, not merely because of the great area and length of the State, with attendant geographical and climatic variations, but because of the numbers of species and extensive ranges of some of the most important members.

SEIZURES OF FISH, GAME AND ILLEGALLY USED FISHING APPARATUS.
July 1, 1910, to June 30, 1912.

| | San Francisco district. | Sacramento district. | Los Angeles district. | Fresno district. | Total. |
|---------------------------------------------------------|-------------------------|----------------------|--------------------------------|------------------|-------------------------------|
| Illegally used fishing apparatus (nets and lines) ----- | 47 | 82 | ----- | 33 | 162 |
| Salmon ----- | 146 lbs. | ----- | ----- | 12 lbs. | 158 lbs. |
| Striped bass ----- | 2,086 lbs. | 355 lbs. | ----- | ----- | 2,441 lbs. |
| Steelhead ----- | 671 lbs. | ----- | ----- | ----- | 671 lbs. |
| Black bass ----- | ----- | 20 lbs. | ----- | 139 lbs. | 159 lbs. |
| Catfish ----- | 50 lbs. | 333 lbs. | ----- | 1,525 lbs. | 1,908 lbs. |
| Trout ----- | 525 lbs. | 100 lbs. | ----- | 16 lbs. | 641 lbs. |
| Crawfish ----- | 25 lbs. | 40 lbs. | 10 lbs. | ----- | 75 lbs. |
| Crabs ----- | 1,774 | 135 | ----- | 60 | 1,969 |
| Dried shrimp ----- | 586 lbs. | ----- | ----- | ----- | 586 lbs. |
| Abalones ----- | ----- | 50 | { 14 16 sacks 24½ sacks* | ----- | { 64 16 sacks 24½sacks* |
| Clams ----- | 390 | ----- | ----- | ----- | 390 |
| Miscellaneous fish ----- | 356 lbs. | 20 lbs. | 3,500 lbs. | ----- | 3,876 lbs. |
| Deer meat ----- | 502 lbs. | 399 lbs. | 145 lbs. | 130 lbs. | 1,176 lbs. |
| Deer hides ----- | 47 | 3 | ----- | ----- | 50 |
| Ducks ----- | 5,822 | ----- | 786 | 350 | 6,958 |
| Quail ----- | 508 | ----- | 30 | 1 | 539 |
| Doves ----- | 20 | ----- | ----- | 11 | 31 |
| Plover, rail, snipe, etc. | 105 | ----- | ----- | ----- | 105 |
| Non-game birds ----- | 561 | ----- | ----- | 5 | 566 |
| Pheasants ----- | ----- | ----- | ----- | 2 live | 2 live |
| Tree squirrels ----- | 60 | ----- | ----- | ----- | 60 |
| Rabbits ----- | 583 | 9 | 57 | 31 | 680 |

Illegally used fishing apparatus, after condemnation in superior courts, is destroyed by the Board; all wholesome fish and game is donated to public and charitable institutions, from whom many grateful letters of acknowledgment have been received.

NOTE.—Complete and accurate record of seizures kept and reported only since April, 1912.

*Sacks of shells.

RECAPITULATION.

| | | |
|----------------------------|-------------|-------------|
| Arrests— | | |
| Fish cases ----- | 748 | |
| Game cases ----- | 1,315 | |
| Total ----- | | 2,063 |
| Convictions— | | |
| Fish cases ----- | 505 | |
| Game cases ----- | 1,116 | |
| Total ----- | | 1,621 |
| Acquittals and dismissals— | | |
| Fish cases ----- | 200 | |
| Game cases ----- | 193 | |
| Total ----- | | 393 |
| Pending cases— | | |
| Fish cases ----- | 43 | |
| Game cases ----- | 6 | |
| Total ----- | | 49 |
| Total ----- | | 2,063 |
| Fines imposed— | | |
| Fish cases ----- | \$12,725 00 | |
| Game cases ----- | 23,993 50 | |
| Total ----- | | \$36,718 50 |
| Fines paid into courts— | | |
| Fish cases ----- | \$11,415 00 | |
| Game cases ----- | 23,109 00 | |
| Total ----- | | \$34,524 00 |

HUNTING LICENSES ISSUED—FISH AND GAME COMMISSION AND COUNTIES.

| Counties. | Fiscal year 1910-1911. | | | Fiscal year 1911-1912. | | | | |
|--------------------|------------------------|-------------|-------------|------------------------|------------|-------------|-------------|-----------|
| | At \$1.00. | At \$10.00. | At \$25.00. | Total. | At \$1.00. | At \$10.00. | At \$25.00. | Total. |
| | Alameda | \$6,946 00 | | \$125 00 | \$7,071 00 | \$7,173 00 | | \$100 00 |
| Alpine | 50 00 | \$20 00 | | 70 00 | 59 00 | | | 109 00 |
| Amador | 992 00 | 10 00 | | 1,002 00 | 950 00 | | | 950 00 |
| Butte | 2,731 00 | | | 2,731 00 | 2,878 00 | | | 2,878 00 |
| Calaveras | 829 00 | | | 829 00 | 1,116 00 | | | 1,116 00 |
| Colusa | 1,707 00 | 40 00 | | 1,747 00 | 1,668 00 | 20 00 | | 1,688 00 |
| Contra Costa | 1,474 00 | | | 1,474 00 | 1,610 00 | | 50 00 | 1,660 00 |
| Del Norte | 322 00 | | | 322 00 | 292 00 | | | 292 00 |
| El Dorado | 955 00 | | | 955 00 | 1,001 00 | | 25 00 | 1,026 00 |
| Fresno | 5,302 00 | 10 00 | 200 00 | 5,512 00 | 5,846 00 | 10 00 | 100 00 | 5,956 00 |
| Fresno office | 62 00 | | | 62 00 | 374 00 | | | 374 00 |
| Glenn | 977 00 | | 50 00 | 1,027 00 | 1,102 00 | | | 1,102 00 |
| Humboldt | 3,452 00 | 10 00 | 100 00 | 3,652 00 | 3,296 00 | 30 00 | 125 00 | 3,451 00 |
| Imperial | 405 00 | | | 405 00 | 366 00 | | | 366 00 |
| Inyo | 930 00 | 80 00 | | 1,010 00 | 915 00 | 10 00 | | 950 00 |
| Kern | 4,619 00 | 10 00 | 75 00 | 4,734 00 | 4,964 00 | | | 5,039 00 |
| Kings | 1,342 00 | 10 00 | | 1,352 00 | 1,246 00 | | | 1,246 00 |
| Lake | 1,191 00 | | | 1,191 00 | 1,218 00 | | 25 00 | 1,243 00 |
| Lassen | 541 00 | 10 00 | | 551 00 | 618 00 | 20 00 | | 638 00 |
| Los Angeles | 15,028 00 | 120 00 | 150 00 | 15,298 00 | 12,886 00 | 100 00 | 150 00 | 13,136 00 |
| Los Angeles office | 2,931 00 | 110 00 | 125 00 | 3,166 00 | 4,892 00 | 40 00 | 50 00 | 4,982 00 |
| Madera | 727 00 | | | 727 00 | 764 00 | 10 00 | | 790 00 |
| Marin | 856 00 | | 125 00 | 981 00 | 608 00 | | | 608 00 |
| Mariposa | 300 00 | | | 300 00 | 341 00 | | | 341 00 |
| Mendocino | 1,680 00 | 10 00 | 125 00 | 1,815 00 | 2,235 00 | 10 00 | 250 00 | 2,495 00 |
| Merced | 1,701 00 | 10 00 | 75 00 | 1,789 00 | 1,753 00 | | 175 00 | 1,928 00 |
| Modoc | 486 00 | 10 00 | | 506 00 | 599 00 | | | 599 00 |
| Mono | 197 00 | 60 00 | | 257 00 | 232 00 | 60 00 | | 292 00 |
| Monterey | 2,217 00 | 20 00 | 50 00 | 2,287 00 | 2,046 00 | 10 00 | 25 00 | 2,081 00 |
| Napa | 1,840 00 | | 150 00 | 1,990 00 | 1,881 00 | | | 1,881 00 |
| Nevada | 1,624 00 | | | 1,624 00 | 1,640 00 | | 25 00 | 1,665 00 |
| Orange | 2,351 00 | | | 2,351 00 | 2,363 00 | | | 2,363 00 |
| Placer | 1,779 00 | | 100 00 | 1,879 00 | 1,900 00 | | 100 00 | 2,000 00 |
| Plumas | 515 00 | 30 00 | | 545 00 | 493 00 | | 25 00 | 518 00 |
| Riverside | 3,101 00 | 20 00 | 150 00 | 3,271 00 | 2,886 00 | 20 00 | 50 00 | 2,956 00 |
| Sacramento | 3,925 00 | 10 00 | 100 00 | 4,035 00 | 4,517 00 | 20 00 | 200 00 | 4,737 00 |
| San Benito | 966 00 | 10 00 | | 1,006 00 | 1,045 00 | | 75 00 | 1,120 00 |
| San Bernardino | 3,675 00 | | | 3,675 00 | 3,488 00 | 10 00 | | 3,498 00 |

| | | | | | | | |
|----------------------|---------------------|-------------------|-------------------|---------------------|---------------------|-----------------|-------------------|
| San Diego | 3,493 00 | 20 00 | 125 00 | 3,513 00 | 3,631 00 | 20 00 | 3,651 00 |
| San Francisco | 760 00 | | 885 00 | | | | 14,233 00 |
| San Francisco office | 13,588 00 | 150 00 | 1,100 00 | 14,838 00 | 13,038 00 | 70 00 | 1,125 00 |
| San Joaquin | 3,377 00 | | 25 00 | 3,402 00 | 3,579 00 | | 50 00 |
| San Luis Obispo | 1,444 00 | 10 00 | 50 00 | 1,504 00 | 1,368 00 | | 25 00 |
| San Mateo | 1,720 00 | 20 00 | 25 00 | 1,765 00 | 1,623 00 | | 75 00 |
| Santa Barbara | 1,644 00 | 40 00 | 75 00 | 1,759 00 | 1,800 00 | 50 00 | 50 00 |
| Santa Clara | 4,177 00 | 10 00 | 25 00 | 4,212 00 | 4,545 00 | | 50 00 |
| Santa Cruz | 1,934 00 | | 25 00 | 1,959 00 | 2,310 00 | 10 00 | 25 00 |
| Shasta | 2,240 00 | 20 00 | | 2,260 00 | 1,935 00 | 10 00 | |
| Sierra | 148 00 | | | 148 00 | 167 00 | | 167 00 |
| Siskiyou | 3,126 00 | 70 00 | 75 00 | 3,271 00 | 3,218 00 | 30 00 | 125 00 |
| Solano | 1,917 00 | | 175 00 | 2,092 00 | 2,315 00 | 10 00 | 150 00 |
| Sonoma | 4,734 00 | | 225 00 | 4,959 00 | 5,455 00 | | 275 00 |
| Stanislaus | 1,674 00 | | 25 00 | 1,699 00 | 1,546 00 | 10 00 | |
| Sutter | 860 00 | 20 00 | 25 00 | 905 00 | 873 00 | | 25 00 |
| Tehama | 1,302 00 | 40 00 | | 1,342 00 | 1,243 00 | | |
| Trinity | 793 00 | | | 793 00 | 668 00 | | 25 00 |
| Tulare | 2,760 00 | 10 00 | | 2,770 00 | 3,065 00 | 10 00 | |
| Tuolumne | 1,052 00 | 10 00 | | 1,062 00 | 1,069 00 | | 25 00 |
| Ventura | 1,864 00 | 10 00 | 75 00 | 1,949 00 | 1,792 00 | 40 00 | 25 00 |
| Yolo | 1,644 00 | 30 00 | 25 00 | 1,699 00 | 1,856 00 | | 100 00 |
| Yuba | 1,267 00 | 10 00 | | 1,277 00 | 1,194 00 | | |
| Totals | \$138,410 00 | \$1,080 00 | \$3,775 00 | \$143,265 00 | \$141,551 00 | \$680 00 | \$3,950 00 |

Total number licenses issued 1910 1911 ----- 138,669

Total number licenses issued 1911 1912 ----- 141,777

COMMERCIAL FISHING LICENSES ISSUED.

April 1, 1910, to March 31, 1911—

| | |
|---------------|--------------------|
| Alien ----- | \$19,140 00 |
| Citizen ----- | 4,455 00 |
| Total ----- | <u>\$23,595 00</u> |

April 1, 1911, to March 31, 1912—

| Name of district. | Alien. | Citizen. | Total. |
|---------------------------------|-------------|------------|-------------|
| Lower Sacramento ----- | \$650 00 | \$462 50 | \$1,112 50 |
| Upper Sacramento ----- | 10 00 | 287 50 | 297 50 |
| Southern California coast ----- | 3,730 00 | 1,117 50 | 4,847 50 |
| Bay district ----- | 800 00 | 67 50 | 867 50 |
| Bay district ----- | 620 00 | 45 00 | 665 00 |
| Tomales Bay district ----- | 180 00 | 110 00 | 290 00 |
| Bay district ----- | 5,130 00 | 377 50 | 5,507 50 |
| Bay district ----- | 620 00 | 20 00 | 640 00 |
| Tahoe district ----- | 10 00 | 237 50 | 247 50 |
| Monterey district ----- | 1,180 00 | 132 50 | 1,312 50 |
| Humboldt district ----- | 260 00 | 102 50 | 362 50 |
| Del Norte district ----- | 520 00 | 375 00 | 895 00 |
| Bay district ----- | 390 00 | 12 50 | 402 50 |
| San Joaquin district ----- | 20 00 | 15 00 | 35 00 |
| Humboldt district ----- | 380 00 | 457 50 | 837 50 |
| Humboldt district ----- | | 7 50 | 7 50 |
| San Joaquin district ----- | 10 00 | 7 50 | 17 50 |
| Upper Sacramento district ----- | | 12 50 | 12 50 |
| All districts ----- | 4,135 00 | 1,052 50 | 5,187 50 |
| Totals ----- | \$18,645 00 | \$4,902 50 | \$23,545 00 |

STATEMENT OF LION BOUNTIES PAID BY FISH AND GAME COMMISSION
FROM OCTOBER, 1907, TO JANUARY 1, 1913.

| Counties. | 1907. | 1908. | 1909. | 1910. | 1911. | 1912. | Total. |
|-----------------|-------|-------|-------|-------|-------|-------|--------|
| Alameda | | 1 | | | | | 1 |
| Amador | | 3 | | 1 | 2 | 2 | 8 |
| Butte | 2 | 11 | 5 | 2 | 4 | 3 | 27 |
| Calaveras | | 1 | 4 | 1 | | 1 | 7 |
| Colusa | | 3 | | 3 | 3 | 1 | 10 |
| Del Norte | | 10 | 12 | 4 | 11 | 11 | 48 |
| El Dorado | 2 | 7 | 2 | 1 | 8 | 9 | 29 |
| Fresno | | 1 | 3 | 1 | | 4 | 9 |
| Glenn | | 13 | 6 | 6 | 1 | 4 | 30 |
| Humboldt | 10 | 113 | 67 | 71 | 42 | 50 | 353 |
| Inyo | | | | | | 1 | 1 |
| Kern | | 8 | 10 | 12 | 5 | 9 | 44 |
| Lake | 2 | 14 | 11 | 13 | 9 | 10 | 59 |
| Lassen | | | 1 | | 2 | 1 | 4 |
| Los Angeles | | 7 | 1 | 2 | 2 | | 12 |
| Madera | | 3 | 5 | 1 | | 1 | 10 |
| Mariposa | 2 | 4 | 3 | 6 | 2 | 1 | 18 |
| Mendocino | 5 | 44 | 18 | 11 | 16 | 17 | 111 |
| Merced | | | | 1 | | | 1 |
| Modoc | | | 1 | 1 | 1 | | 3 |
| Monterey | | 14 | 11 | 7 | 1 | 3 | 36 |
| Napa | | | | 1 | | 2 | 3 |
| Nevada | | 1 | 1 | 1 | | | 3 |
| Orange | | | 1 | 1 | 1 | | 3 |
| Placer | | 5 | 4 | 1 | 2 | 7 | 19 |
| Plumas | | | | 3 | | 1 | 6 |
| Riverside | | 2 | 5 | | | 4 | 11 |
| San Benito | | 1 | 2 | 1 | 2 | 11 | 17 |
| San Bernardino | | 5 | 2 | 1 | 2 | | 10 |
| San Diego | | 3 | 5 | 5 | 8 | 3 | 24 |
| San Luis Obispo | | 11 | 5 | 9 | 4 | 4 | 33 |
| San Mateo | | | | 1 | | | 1 |
| Santa Barbara | | 7 | 24 | 7 | 3 | 5 | 46 |
| Santa Clara | | | 4 | | | 1 | 5 |
| Santa Cruz | | | | 1 | | | 1 |
| Shasta | 1 | 25 | 32 | 31 | 29 | 28 | 146 |
| Sierra | | 1 | | | | 3 | 4 |
| Siskiyou | 1 | 31 | 35 | 45 | 25 | 25 | 162 |
| Sonoma | | | 2 | 4 | 1 | 4 | 11 |
| Stanislaus | | | 2 | | 1 | | 3 |
| Sutter | | | | | | 1 | 1 |
| Tehama | 3 | 31 | 19 | 25 | 10 | 22 | 110 |
| Trinity | 9 | 86 | 34 | 32 | 22 | 15 | 198 |
| Tulare | | 6 | 8 | 11 | 4 | 5 | 34 |
| Tuolumne | | 6 | 10 | 5 | 2 | 4 | 27 |
| Ventura | | 1 | 6 | 4 | 6 | 2 | 19 |
| Yuba | | 1 | | | 2 | | 3 |
| Totals | 37 | 482 | 361 | 333 | 233 | 275 | 1,721 |

STATE GAME FARM, HAYWARDS.

Distribution of game birds, 1911.

| | Pheasants. | Wild Turkeys. | Partridges. | Quail. |
|-----------------------------------------------------------|------------|---------------|-------------|--------|
| Sold for breeding purposes..... | 200 | 33 | ----- | ----- |
| Given away for breeding and exhibition purposes..... | 88 | ----- | ----- | 22 |
| Released..... | 100 | 400 | 44 | ----- |
| Eggs given away for breeding and exhibition purposes..... | 358 | ----- | ----- | 69 |

STATE GAME FARM, HAYWARDS.

Distribution of game birds, 1912.

Alameda County.

| Date. | Applicant. | Address. | Pheasants. | Wild Turkeys. | Quail. |
|----------|------------------------|----------------------|----------------------|-----------------|----------------|
| 1912. | | | | | |
| Mar. 20 | Fish and Game Com..... | Livermore..... | ----- | 28 ¹ | ----- |
| Mar. 21 | C. A. Kofoid..... | U. C., Berkeley..... | ----- | 1 ² | ----- |
| Mar. 25 | Fish and Game Com..... | Sunol..... | ----- | 14 ¹ | ----- |
| Mar. 25 | Fish and Game Com..... | Livermore..... | ----- | 13 ¹ | ----- |
| Jan. 14 | H. C. Cutting..... | San Lorenzo..... | 5 ³ | ----- | ----- |
| Jan. 15 | Mrs. Mathiassen..... | San Lorenzo..... | 60 ³ | ----- | ----- |
| Jan. 21 | Mr. Childs..... | Oakland..... | 2 ³ | ----- | ----- |
| Feb. 4 | H. C. Cutting..... | San Lorenzo..... | 4 ³ | ----- | ----- |
| Mar. 19 | County Infirmary..... | ----- | 1 ³ | ----- | ----- |
| Apr. 20 | Dr. Harvey Baker..... | Berkeley..... | ----- | 1 ² | ----- |
| May 7 | Mrs. Millette..... | Hayward..... | ----- | ----- | 1 ³ |
| May 7 | Mrs. Millette..... | Hayward..... | ----- | ----- | 1 ³ |
| May 17 | E. K. Strowbridge..... | Hayward..... | 12 eggs ² | ----- | ----- |
| May 24 | F. Russell..... | Alameda..... | 14 eggs ² | ----- | ----- |
| June 7 | J. W. Marvin..... | Livermore..... | 50 eggs ² | ----- | ----- |
| Aug. 10 | C. J. Smith..... | Oakland..... | 2 ² | ----- | ----- |
| Sept. 16 | C. L. Crellin..... | Pleasanton..... | 50 ¹ | ----- | ----- |

Del Norte County.

| | | | | | |
|----------|-----------------|------------|------------------|-------|-------|
| Sept. 25 | Paul Smith..... | Requa..... | 100 ¹ | ----- | ----- |
|----------|-----------------|------------|------------------|-------|-------|

Fresno County.

| | | | | | |
|----------|------------------------|-------------|------------------|-------|-------|
| Feb. 22 | A. V. Lisenby..... | Fresno..... | 3 ⁴ | ----- | ----- |
| Mar. 1 | Fish and Game Com..... | Sanger..... | 40 ¹ | ----- | ----- |
| Sept. 2 | Fish and Game Com..... | Sanger..... | 100 ¹ | ----- | ----- |
| Sept. 23 | Fish and Game Com..... | Dunlap..... | 60 ¹ | ----- | ----- |

Humboldt County.

| | | | | | |
|---------|---------------------|-------------|------------------|-----------------|-------|
| Aug. 24 | Earl P. Barnes..... | Eureka..... | 100 ¹ | ----- | ----- |
| Aug. 24 | Earl P. Barnes..... | Eureka..... | ----- | 50 ¹ | ----- |

Lassen County.

| | | | | | |
|----------|---------------------|-----------------|------------------|-------|-----------------|
| Sept. 4 | Frank P. Cady..... | Susanville..... | 100 ¹ | ----- | ----- |
| Sept. 21 | Geo. Wingfield..... | Jamesville..... | ----- | ----- | 50 ¹ |

STATE GAME FARM, HAYWARDS.

Distribution of Game Birds, 1912—Continued.

Mendocino County.

| Date. | Applicant. | Address. | Pheasants. | Wild Turkeys. | Quail. |
|----------|---------------------|---------------|-----------------|---------------|--------|
| Mar. 5 | Capt. Neilsen | Willits | 3 ³ | ----- | ----- |
| Sept. 13 | B. H. Miller | Ukiah | 50 ¹ | ----- | ----- |

Monterey County

| | | | | | |
|---------|-------------------|---------------------|------------------|----------------|-------|
| May 24 | Frank Shook | Salinas | ----- | 2 ¹ | ----- |
| Aug. 12 | Phil Oyer | Pacific Grove | 100 ¹ | ----- | ----- |

Napa County.

| | | | | | |
|----------|----------------------|------------------|-----------------|-------|-------|
| Sept. 13 | W. J. Moore | Napa | 50 ¹ | ----- | ----- |
| Sept. 18 | John McCormick | St. Helena | 50 ¹ | ----- | ----- |

Nevada County.

| | | | | | |
|----------|----------------------|--------------------|----------------|-----------------|-------|
| Feb. 12 | T. F. Hogan | Grass Valley | 2 ⁴ | ----- | ----- |
| Sept. 18 | Dr. I. W. Hays | Grass Valley | ----- | 30 ¹ | ----- |

Placer County.

| | | | | | |
|---------|-------------------------|---------------|-------|-----------------|-------|
| Sept. 5 | Montgomery Godley | Lincoln | ----- | 25 ¹ | ----- |
|---------|-------------------------|---------------|-------|-----------------|-------|

Sacramento County.

| | | | | | |
|---------|-------------------------|--------------------|-----------------|-----------------|-------|
| Jan. 24 | Fish and Game Com. | Folsom | ----- | 20 ¹ | ----- |
| Oct. 7 | Geo. G. Lacke | Walnut Grove | 50 ¹ | ----- | ----- |

San Benito County.

| | | | | | |
|---------|-------------------------|-------------------|------------------|-----------------|-------|
| Feb. 13 | Fish and Game Com. | Tres Pinos | ----- | 25 ¹ | ----- |
| Aug. 20 | J. H. Hill | Watsonville | ----- | 50 ¹ | ----- |
| Sept. 9 | J. Lee Jones | Tres Pinos | 100 ¹ | ----- | ----- |

San Francisco County.

| | | | | | |
|----------|-----------------------------|-----------------------|-----------------|----------------|-------|
| Mar. 18 | U. S. Marine Hospital | San Francisco | ----- | 1 ² | ----- |
| Mar. 19 | Golden Gate Park | San Francisco | 2 ³ | ----- | ----- |
| Sept. 18 | Capt. C. A. Gove | Yerba Buena Isl. | 25 ¹ | ----- | ----- |

San Mateo County.

| | | | | | |
|---------|---------------------|------------------|-----------------|-------|-------|
| Jan. 22 | J. B. Leonard | Menlo Park | 12 ³ | ----- | ----- |
| Apr. 2 | J. B. Leonard | Menlo Park | 1 ³ | ----- | ----- |

Santa Clara County.

| | | | | | |
|---------|---------------------|---------------------|----------------|----------------|----------------|
| Jan. 25 | R. W. Withey | Los Gatos | 3 ³ | ----- | ----- |
| Feb. 12 | F. S. Daniels | Mountain View | ----- | 1 ⁴ | ----- |
| Mar. 18 | R. W. Withey | Los Gatos | ----- | ----- | 4 ³ |

STATE GAME FARM, HAYWARDS.

Distribution of Game Birds, 1912—Continued.

Santa Cruz County.

| Date. | Applicant. | Address. | Pheasants. | Wild Turkeys. | Quail. |
|---------|-----------------------------------|------------------|-----------------|---------------|--------|
| Aug. 13 | Geo. Martin and H. C. Peckham. | Watsonville ---- | 50 ¹ | ----- | ----- |

Shasta County.

| | | | | | |
|--------|--------------------|---------------|-------|-----------------|-------|
| Oct. 4 | B. C. McCray ----- | Redding ----- | ----- | 32 ¹ | ----- |
|--------|--------------------|---------------|-------|-----------------|-------|

Solano County.

| | | | | | |
|---------|----------------------|------------------|------------------|-------|-------|
| Aug. 27 | John Hollenbeck ---- | Ryer Island ---- | 100 ¹ | ----- | ----- |
|---------|----------------------|------------------|------------------|-------|-------|

Sonoma County.

| | | | | | |
|----------|----------------------|----------------|----------------|-----------------|-------|
| Feb. 5 | Thompson Bros. ----- | Petaluma ----- | 3 ³ | ----- | ----- |
| Sept. 15 | F. M. Child.----- | Cazadero ----- | ----- | 25 ¹ | ----- |

Stanislaus County.

| | | | | | |
|---------|-------------------|---------------|-------|-------|----------------|
| Aug. 14 | Geo. Prowse ----- | Oakdale ----- | ----- | ----- | 1 ³ |
|---------|-------------------|---------------|-------|-------|----------------|

Sutter County.

| | | | | | |
|---------|------------------------|----------------|----------------|-------|-------|
| Feb. 15 | Mrs. D. W. Chilson---- | Pleasant Grove | 1 ⁴ | ----- | ----- |
|---------|------------------------|----------------|----------------|-------|-------|

Tehama County.

| | | | | | |
|---------|--------------------|---------------|----------------|-------|-------|
| Jan. 17 | C. C. Barrows----- | Corning ----- | 4 ⁴ | ----- | ----- |
|---------|--------------------|---------------|----------------|-------|-------|

Tuolumne County.

| | | | | | |
|---------|-----------------------|----------------|-------|-----------------|-------|
| Jan. 23 | Fish and Game Com.... | Tuolumne ----- | ----- | 50 ¹ | ----- |
|---------|-----------------------|----------------|-------|-----------------|-------|

Tulare County.

| | | | | | |
|----------|----------------------------------------------------------|------------------|------------------|-------|-------|
| Sept. 2 | J. D. Blick----- | Three Rivers --- | 50 ¹ | ----- | ----- |
| Sept. 2 | Tom Jacobs ----- | Visalia ----- | 25 ¹ | ----- | ----- |
| Sept. 2 | Porterville Game Pro- tective Association. | Porterville ---- | 50 ¹ | ----- | ----- |
| Sept. 23 | Deer Creek Fish and Game Protective As- sociation. | Hot Springs ---- | 40 ¹ | ----- | ----- |
| | Totals ----- | ----- | 1,398 76 eggs | 368 | 57 |

¹Released.²Given for experiment.³Exchange for other birds.⁴Sold.

HATCHERIES.

Fish Distribution (Partial), Season 1911.

(Note.—Because of the loss of records during the absence from his office of Superintendent W. H. Shebley in 1911, only a partial statement of that season's distribution can be given.) (Secretary.)

| Counties. | Black bass. | Rainbow trout. | Eastern brook trout. | Loch Leven trout. | Black-spotted trout. | Steelhead trout. |
|----------------|--------------|------------------|----------------------|-------------------|----------------------|------------------|
| Alameda | | 10,000 | | | | 345,000 |
| Amador | | 16,000 | | 6,000 | | |
| Butte | | 74,000 | 18,000 | 9,000 | | |
| Calaveras | | 72,000 | | | | |
| Contra Costa | | | | | | 8,000 |
| Colusa | | 40,000 | 8,000 | | | 8,000 |
| El Dorado | | 117,000 | 60,500 | 35,500 | 1,636,305 | |
| Fresno | | 12,000 | | 36,000 | | 6,000 |
| Inyo | | 60,000 | 37,000 | 43,000 | | |
| Kern | 700 | 30,000 | | 6,000 | | |
| Lake | | 24,000 | | | | 68,000 |
| Lassen | | 44,000 | 16,000 | 4,000 | | |
| Los Angeles | 50 | 79,500 | | | | |
| Marin | | | | | | 65,000 |
| Mariposa | | 54,000 | 20,000 | 50,000 | | |
| Mendocino | | | | | | 283,000 |
| Modoc | | 48,000 | 20,000 | 14,000 | | |
| Mono | | 42,000 | 36,000 | 38,000 | | |
| Monterey | | 46,000 | | | | |
| Napa | | 52,000 | | | | 44,000 |
| Nevada | | 108,000 | 61,000 | 95,000 | | 215,000 |
| Orange | 775 | 15,000 | | | | |
| Placer | | 174,100 | 113,000 | 50,500 | 758,446 | |
| Plumas | | 75,000 | 40,500 | 126,000 | | |
| Riverside | *1,130 | | | | | |
| Sacramento | | | | | | 250,000 |
| San Benito | | 36,000 | | | | 4,000 |
| San Bernardino | *630 | 540,000 | | | | |
| San Diego | | 18,000 | | | | |
| San Mateo | | 32,000 | | | | 434,000 |
| Santa Barbara | | 36,000 | | | | |
| Santa Clara | | 64,000 | 2,000 | | | 110,000 |
| Shasta | | 331,000 | | 8,000 | | |
| Sierra | | 16,000 | 6,000 | | 335,000 | |
| Siskiyou | | 174,000 | 17,500 | 35,500 | | |
| Solano | | 10,000 | | 10,000 | | 12,000 |
| Sonoma | | 20,000 | | | | |
| Tehama | | 96,000 | 4,000 | 4,000 | | |
| Trinity | | 22,000 | | 12,800 | | |
| Tulare | | 100,000 | 20,000 | 250 | | 6,100 |
| Tuolumne | | 78,000 | 18,000 | 24,000 | | |
| Ventura | | 33,000 | | | | |
| Yuba | | 12,000 | | | | |
| Totals | 3,285 | 2,810,600 | 497,500 | 607,550 | 2,729,751 | 1,858,100 |

*Adult.

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LOCH LEVEN TROUT.

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------------------------------|---------|----------------------------------------------------------------------------------------------------|--------------------|
| R. Belden | 3,000 | Indian and Yellow creeks, Plumas County..... | May |
| H. C. Chamberlain and others. | 18,000 | Homer Lake, Long Valley reservoir, and Wolf Creek, Plumas County. | May |
| W. C. Robinson..... | 18,000 | Bear, Buck, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County. | May |
| M. H. Bernheim..... | 12,000 | Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County. | May |
| Portola Improvement Association. | 9,000 | Willow, Humbug and Grizzly creeks, Plumas County. | May |
| Smith & Weil..... | 6,000 | Mill Creek and Three Lakes, Plumas County.. | May |
| Taylorville Gun Club.... | 12,000 | Lights, Cooks, Indian and Grizzly creeks, Plumas County. | May |
| Quiney Gun Club..... | 18,000 | Spanish, Rock, Mill, Clear, Greenhorn, Taylor creeks and Middle Fork Feather River, Plumas County. | May |
| C. N. Johnston..... | 12,000 | Feather River and Smith Creek, Plumas County. | May |
| G. F. Edwards..... | 12,000 | Tributaries of Feather River, Plumas County | May |
| A. Maehomich | 6,000 | Feather River, Sulphur and Willow creeks, Plumas County. | May |
| F. M. Rutherford..... | 15,000 | Truckee River, Schaffer and Alder creeks, Nevada County. | May |
| N. A. Hawkins..... | 18,000 | Shasta River, Siskiyou County..... | May |
| North Fork Game Protective Association. | 12,000 | Willow Creek, Placer County..... | May |
| J. B. Knapp..... | 6,000 | Canyon Creek and North Fork American River, Placer County. | June |
| Lake Tahoe Railway and Transportation Co. | 18,000 | Blackwood Creek and Truckee River, Placer County. | June |
| Nevada City Hunting and Fishing Club. | 21,000 | Deer and Rock creeks and Woods Ravine, Nevada County. | June |
| L. Y. Coggins..... | 9,000 | Dobkins Lake and North Fork Eddy Creek, Siskiyou County. | June |
| E. Meybem | 12,000 | Butte Creek, Butte County..... | June |
| Fred Werner | 12,000 | Sutter Creek, Amador County..... | June |
| City of Vallejo..... | 30,000 | Lake No. 2 and creek between Dam No. 1 and Dam No. 2, Solano County. | June |
| Fresno Division, Fish and Game Commission. | 36,000 | Tamarack, Maxwell, Log Cabin, Two Mile, Pingley and Red Can lakes, Tuolumne County. | July |
| Geo. F. Conlin..... | 12,000 | South Fork Stanislaus River, Tuolumne County. | July |
| R. B. Shaw and H. M. De Ferrari. | 24,000 | North and Middle forks Tuolumne River, Tuolumne County. | July |
| J. O. Bigelow..... | 24,000 | Basin Creek, Tuolumne County..... | July |
| D. E. Roberts..... | 12,000 | North Fork Stanislaus River and Beaver, San Antone and O'Neal creeks, Calaveras County. | July |
| H. M. Freeman..... | 36,000 | Three Loch Leven lakes, Placer County..... | July |
| Miss Katherine Chandler.. | 12,000 | Five Lakes and Bear and Squaw creeks, Placer County. | July |
| Al Tahoe Company..... | 6,000 | Trout and Cold creeks, El Dorado County.... | July |
| H. E. Cagwin..... | 9,000 | Upper and Lower Echo lakes, El Dorado County. | July |
| Santa Clara Fish and Game Protective Association. | 24,000 | Planted in the streams of Santa Clara County | July |
| G. F. Edwards..... | 18,000 | Gold Lake, Plumas County..... | July |
| H. L. Beeroff..... | 6,000 | Grizzly Creek and Ice Lake, Plumas County.. | July |
| Frank P. Cady..... | 7,500 | Susan River and Silver and Caribou lakes, Lassen County. | July |
| Geo. D. Campbell..... | 2,500 | East Creek, Modoc County..... | July |
| L. H. Sisson..... | 2,500 | South Fork Mill Creek, Modoc County..... | July |
| Ira Hansen | 2,500 | Parker Creek, Modoc County..... | July |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF LOCH LEVEN TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|--------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------|--------------------|
| Sisson Promotion Association. | 18,000 | Sullaway, Big Spring Creek and North Fork of Sacramento River, Siskiyou County. | July |
| Geo. Neale | 6,000 | Battle Creek, Tehama County. | July |
| Fresno Division, Fish and Game Commission. | 36,000 | Barren Lakes of High Sierra, Madera County | July |
| W. P. Yaney | 9,000 | Longley, Horton, Birch creeks and Middle and South Forks of Bishop Creek, Inyo County. | July |
| A. L. Stewart | 3,000 | Wyman and Crooked creeks, Inyo County. | July |
| Hall & McAfee | 27,000 | Baker, Big Pine, Little Pine, Birch and Tinnemaha creeks, Big Pine Lakes and Red Mountain Lakes, Inyo County. | July |
| A. Davies | 9,000 | Little Truekee River, Nevada County. | August |
| A. Papa | 18,000 | South Yuba River, Placer County. | August |
| J. S. Cain | 6,000 | Walker River, Mono County. | August |
| A. G. McFarland | 6,000 | South Fork Yuba River, Placer County. | August |
| Webber Lake Club. | 18,000 | Tributary to Webber Lake, Nevada County. | August |
| G. F. Zentgraf | 12,000 | Pilot and Bear creeks, El Dorado County. | August |
| J. M. Amick | 6,000 | Mokelumne and Bear rivers and South Fork Cosumnes River, Amador County. | August |
| G. S. Wilson | 12,000 | Indian, Reddings, Browns, East Weaver and Rush creeks, Trinity County. | August |
| W. E. Tebbe | 12,000 | Island Lake, Siskiyou County. | August |
| Geo. E. King | 15,000 | Woodruth and Rock creeks and North, East and South Forks Yuba River, Sierra County. | September |
| R. Colwell | 5,000 | Rubicon River and Rock Bound Lake, El Dorado County. | September |
| Jas. Bryson | 12,500 | Echo and Adrian lakes and American River, El Dorado County. | September |
| Glen Alpine Springs Company. | 6,000 | Glen Alpine Creek and Grass, Susie and Heather lakes, El Dorado County. | September |
| Mayo A. Greenlaw | 9,000 | Echo Lake, El Dorado County. | September |
| W. W. Price | 15,000 | Witches' Cave and Floating Island, Cathedral, Upper and Lower Angora lakes and Glen Alpine Creek, El Dorado County. | September |
| Grass Valley Sportsmen's Club. | 17,500 | Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County. | September |
| Murphy Bros. and Morgan. | 12,500 | Bear, Hawk, Richardson and Granite lakes, El Dorado County. | September |
| Lawrence & Comstock | 9,000 | Floating Island and Angora lakes, El Dorado County. | September |
| Bert Berry | 7,500 | Poro Creek, Tulare County. | September |
| Shaver Lake Fishing Club | 35,000 | Shaver Lake, Fresno County. | September |
| Deer Creek Fish and Game Protective Association. | 5,000 | North and South Deer creeks, Tulare County. | September |
| T. A. Chatten | 7,500 | Eagle Creek, Kaweah Creek and Franklin Lake, Tulare County. | September |
| W. A. Sperry | 5,000 | Grizzly Creek and Clover Valley, Plumas County. | September |
| Robert Belden | 9,000 | Entire shipment lost because of lack of care. | September |
| Fuell Gray | 15,000 | Cody, Right, Doik, Blood, Suecor, Echo and Adrian lakes and American River, El Dorado County. | September |
| Dr. C. S. Noble and others. | 5,000 | Lopez, Arroyo Grande and Tar Spring creeks, San Luis Obispo County. | September |
| A. D. Shepard | 20,000 | Castle Lake, Siskiyou County. | September |
| Pacific Gas and Electric Company. | 30,000 | Lakes Spaulding and Fordyce, Placer County. | September |
| Yosemite Valley Railway Company. | 60,000 | Mereed River, Merced County. | September |
| Major Wm. W. Forsyth. | 20,000 | Mereed River, Mariposa County. | September |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF LOCH LEVEN TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Jas. A. Vale..... | 50,000 | Lytle, Devoir, Cable, City, Plunge, Bear, Mill, Salfrut, Creeley, Deep, Huston, Grass Valley, Little Bear and Hook and Holcomb creeks and Devil and Waterman canyons, San Bernardino County. | October |
| B. L. Crise..... | 5,000 | Pauma Creek, San Diego County..... | October |
| Ed. Fletcher..... | 7,500 | San Luis Rey River, San Diego County..... | October |
| W. C. Davidson..... | 5,000 | Garcia River and Saunders Creek, Mendocino County. | October |
| Chas. Wright..... | 40,000 | Cold Creek, Siskiyou County..... | October |
| Otas E. Pile..... | 7,500 | Butte Creek and Oris Lake, Siskiyou County.. | October |
| C. M. Parker..... | 9,000 | Back Fence, Kangaroo, Bull and Secret lakes, Siskiyou County. | October |
| Fred. Sullaway..... | 30,000 | Wagon Creek, Siskiyou County..... | October |
| Fish and Game Commission. | 35,000 | Big Spring Creek at Rupps Lake, Siskiyou County. | October |
| Fish and Game Commission. | 20,000 | Headwaters Sacramento River, Siskiyou County. | October |
| Fish and Game Commission. | 43,000 | Sacramento River at Delta, Shasta County... | October |
| | 10,000 | Held in hatchery ponds, Sisson. | |
| Total..... | 1,293,500 | | |

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF EASTERN BROOK TROUT.

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|-------------------------------------------|---------|-------------------------------------------------------------------------------------------------------|--------------------|
| J. M. Little..... | 6,000 | Rieh Guleh and Rush Creek, Plumas County.. | May |
| H. C. Chamberlain and associates. | 18,000 | Homer Lake, Long Valley reservoir and Wolf Creek, Plumas County. | May |
| W. C. Robinson..... | 18,000 | Bear, Buck, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County. | May |
| G. C. Longhurst..... | 6,000 | Poplar and Miller creeks, Plumas County..... | May |
| M. A. Bernheim..... | 12,000 | Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County. | May |
| Portola Improvement Association. | 9,000 | Willow, Humbug and Grizzly creeks, Plumas County. | May |
| Smith & Weil..... | 6,000 | Mill Creek and Three Lakes, Plumas County.. | May |
| Taylorville Gun Club..... | 12,000 | Lights, Cooks, Indian and Grizzly creeks, Plumas County. | May |
| Quincy Gun Club..... | 12,000 | Spanish, Rock, Mill, Clear, Greenhorn and Taylor creeks and Middle Fork Feather River, Plumas County. | May |
| A. Machomieh..... | 6,000 | Feather River, Sulphur and Willow creeks, Plumas County. | May |
| Chas. Geisendorfer..... | 6,000 | Catfish Creek, Placer County..... | June |
| W. J. McCleary..... | 9,000 | Combs Ravine and Bunch Canyon, Placer County. | June |
| Samuel Mitchell..... | 6,000 | Bear River and Canyon Creek, Placer County | June |
| Boea Mill Company..... | 10,000 | Little Truckee River, Nevada County..... | June |
| F. M. Rutherford..... | 20,000 | Truckee River, Schaffer and Alder creeks, Nevada County. | June |
| W. F. Whittier..... | 12,000 | Warmcastle Canyon, Squaw and Snell creeks, Siskiyou County. | June |
| North Fork Game Protective Association. | 12,000 | Gass Canyon Creek and Dry Creek, Placer County. | June |
| J. F. Geisendorfer..... | 6,000 | Headwaters of Woolley Creek, Placer County | June |
| J. B. Knapp..... | 18,000 | Canyon Creek and North Fork American River, Placer County. | June |
| H. M. Freeman..... | 24,000 | South Yuba River, Placer County..... | June |
| A. S. Nichols..... | 12,000 | Feather River, Sierra County..... | June |
| Lake Tahoe Railway and Transportation Co. | 24,000 | Blackwood Creek and Truckee River, Placer County. | June |
| Grover Russi..... | 18,000 | Prosser Creek, Nevada County..... | June |
| North Fork Game Protective Association. | 18,000 | North and Middle Forks American River, Owl and Grass Canyon creeks, Placer County. | June |
| Nevada City Hunting and Fishing Club. | 39,000 | Deer, Rock, Little Deer creeks and Woods Ravine, Nevada County. | June |
| C. F. Hensel..... | 12,000 | North Fork Elder Creek, Tehama County.... | June |
| E. Meybem..... | 12,000 | Butte Creek, Butte County..... | June |
| Ocean Shore Railroad Company. | 6,000 | Pedro, Tunitas, Freneman, Higgins, Lobitos and Purissima creeks, San Mateo County. | June |
| Chas. H. Glenn..... | 18,000 | Mill Creek and South, Middle and North Forks Stony Creek, Colusa County. | June |
| Phil T. Laugenour..... | 18,000 | Cache and Allen creeks, Yolo County..... | June |
| H. H. Zimmerman..... | 12,000 | Mill Creek, Tehama County..... | June |
| Mrs. Geo. Farley, Jr..... | 18,000 | Kelsey Creek, Lake County..... | June |
| B. G. Diehman..... | 12,000 | Clear Creek, Napa County..... | June |
| Sierra and San Francisco Power Company. | 18,000 | Indian and Clarks creeks and Middle Fork Stanislaus River, Tuolumne County. | July |
| Geo. F. Conlin..... | 12,000 | South Fork Stanislaus River, Tuolumne County. | July |
| G. W. Vestal..... | 9,000 | South Fork Cottonwood Creek, Tehama County. | July |
| W. M. McCleary..... | 9,000 | Shirrtail Canyon, Placer County..... | July |
| W. J. Hall..... | 6,000 | Bear River, Placer County..... | July |
| H. Wilkie..... | 12,000 | Prosser Creek, Nevada County..... | July |
| Miss Katherine Chandler. | 12,000 | Five Lakes, Bear and Squaw creeks, Placer County. | July |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF EASTERN BROOK TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|----------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------|--------------------|
| Glen Alpine Springs Company. | 9,000 | Susie Lake, El Dorado County..... | July |
| Al Tahoe Company..... | 6,000 | Trout and Cold creeks, El Dorado County.... | July |
| Mrs. G. W. Kenney..... | 6,000 | Independence Lake, Nevada County..... | July |
| Lawrence & Comstock.... | 18,000 | Small lakes and streams near Tallac, El Dorado County. | July |
| Tahoe Vista Investment Company. | 9,000 | Griff Creek, Placer County..... | July |
| H. E. Cagwin..... | 9,000 | Upper and Lower Echo lakes, El Dorado County. | July |
| Santa Clara County Fish and Game Protective Association. | 36,000 | Distributed in streams of Santa Clara County | July |
| Frank P. Cady..... | 7,500 | Susan River, Silver and Caribou lakes, Lassen County. | July |
| F. D. Hall..... | 5,000 | Willow Creek Lassen County..... | July |
| Wm. E. Vincent..... | 2,500 | Secret Creek, Lassen County..... | July |
| Chas. W. Williams..... | 2,500 | Parker Creek, Modoc County..... | July |
| Geo. D. Campbell..... | 2,500 | East Creek, Modoc County..... | July |
| L. H. Sisson..... | 2,500 | South Fork Mill Creek, Modoc County..... | July |
| E. E. Archer..... | 5,000 | Shealds Creek, Modoc County..... | July |
| I. Lauer..... | 2,500 | Pine Creek, Modoc County..... | July |
| Sisson Promotion Association. | 15,000 | Sullaway, Big Spring creeks and North Fork Sacramento River, Siskiyou County. | July |
| Geo. Neale..... | 6,000 | Battle Creek, Tehama County..... | July |
| W. P. Yaney..... | 18,000 | Longley, Horton and Birch creeks and Middle and South Forks Bishop creek, Inyo County. | July |
| A. L. Stewart..... | 9,000 | Wyman and Crooked creeks, Inyo County..... | July |
| Hall & McAfee..... | 30,000 | Baker, Big Pine, Little Pine, Birch, Tinnehaha creeks, Big Pine Lakes and Red Mountain Lakes, Inyo County. | July |
| Harry Shaw..... | 12,000 | Dexter Creek, Inyo County..... | July |
| R. G. Buchanan..... | 3,000 | Walker River, Mono County..... | August |
| J. S. Cain..... | 6,000 | Walker River, Mono County..... | August |
| North Fork Association.. | 9,000 | North Fork American River, Placer County.... | August |
| A. G. McFarland..... | 6,000 | South Fork Yuba River, Placer County..... | August |
| Webber Lake Club..... | 6,000 | Tributary of Webber Lake, Nevada County.. | August |
| J. E. Powell..... | 6,000 | Walker River and Lost Canyon, Mono County | August |
| C. W. Rickey..... | 6,000 | Walker River and Big Slough, Mono County.. | August |
| G. F. Zentgraf..... | 6,000 | Pilot and Bear creeks, El Dorado County.... | August |
| Jas. Bryson..... | 7,500 | Echo and Adrian lakes and American River, El Dorado County. | August |
| Grass Valley Sportsmen's Club. | 20,000 | Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County. | August |
| A. D. Ferguson..... | 30,000 | Six unnamed lakes in High Sierras of Fresno County. | August |
| Deer Creek Fish and Game Protective Association. | 5,000 | North and South Deer creeks, Tulare County | August |
| W. A. Sperry..... | 5,000 | Grizzly Creek and Clover Valley creek, Plumas County. | August |
| Yosemite Valley Railroad Company. | 10,000 | Merced River, Mariposa County..... | September |
| Major Wm. W. Forsyth.. | 10,000 | Merced River, Mariposa County..... | September |
| W. C. Davidson..... | 5,000 | Garcia River and Saunders Creek, Mendocino County. | October |
| Chas. Wright..... | 10,000 | Cold Creek, Siskiyou County..... | October |
| | 17,500 | Held in hatchery ponds, Sisson. | |
| Total..... | 906,000 | | |

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT.

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------|--------------------|
| J. McClung | 12,000 | Berry Creek, Plumas County | May |
| F. E. Gerry | 30,000 | North Fork Feather River, Plumas County | May |
| R. Belden | 6,000 | Indian and Yellow creeks, Plumas County | May |
| J. M. Little | 6,000 | Rieh Gulch and Rush Creek, Plumas County | May |
| J. C. Donnelly | 3,000 | Grizzly Creek, Plumas County | May |
| H. C. Chamberlain and associates. | 24,000 | Homer Lake, Long Valley reservoir and Wolf Creek, Plumas County. | May |
| W. C. Robinson and others. | 51,000 | Bear, Birch, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County. | May |
| G. C. Longhurst | 6,000 | Poplar and Miller creeks, Plumas County | May |
| M. H. Bernheim | 12,000 | Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County. | May |
| Portola Improvement Association. | 12,000 | Willow, Humbug and Grizzly creeks, Plumas County. | May |
| R. Van der Naillen | 9,000 | Yellow and Butte creeks, Plumas County | May |
| Smith & Weil | 18,000 | Mill Creek and Three Lakes, Plumas County | May |
| Taylorville Gun Club | 24,000 | Lights, Cooks, Indian and Grizzly creeks, Plumas County. | May |
| G. H. Goodhue | 30,000 | Indian Creek, Plumas County | May |
| Quiney Gun Club | 54,000 | Spanish, Rush, Mill, Clear, Greenhorn and Taylor creeks, and Middle Fork Feather River, Plumas County. | May |
| T. A. Church | 12,000 | Long Valley Creek, Plumas County | May |
| C. N. Johnson | 12,000 | Feather River and Smith Creek, Plumas County. | May |
| A. Machomich | 18,000 | Feather River, Sulphur and Willow creeks, Plumas County. | May |
| Wm. Galleppi estate | 12,000 | Last Chane Valley creeks, Plumas County | May |
| Chas. Geisendorfer | 6,000 | Catfish Creek, Placer County | June |
| W. J. McCleary | 6,000 | Bunch Canyon and Combs Ravine, Placer County. | June |
| Samuel Mitchell | 9,000 | Bear River and Canyon Creek, Placer County | June |
| Boea Mill Company | 68,500 | Little Truckee River, Nevada County | June |
| F. M. Rutherford | 10,000 | Truckee River, Schaffer and Alder creeks, Nevada County. | June |
| Sierra Nevada Wood and Lumber Company. | 40,000 | Prosser Creek, Nevada County | June |
| S. McKay | 25,000 | Donner Creek, Nevada County | June |
| G. F. Kelly | 35,000 | Truckee River and tributaries, Nevada County | June |
| W. F. Whittier | 24,000 | Warmcastle Canyon, Squaw Creek and Snell Creek, Siskiyou County. | June |
| McCloud River Railroad | 60,000 | McCloud River, Siskiyou County | June |
| W. I. Bray | 30,000 | Antelope Creek, Siskiyou County | June |
| Siskiyou County Electric Light and Power Company. | 30,000 | Fall Creek, Siskiyou County | June |
| Z. Abrams | 18,000 | Abrams Lake, Siskiyou County | June |
| Geo. Dennis | 60,000 | Big Springs, Siskiyou County | June |
| H. R. Hanley | 18,000 | Squaw Creek, Shasta County | June |
| North Fork Game Protective Association. | 12,000 | Grass Canyon and Dry creeks, Placer County | June |
| Clark & Branson | 30,000 | French, Payne's, Etna and Patterson creeks Siskiyou County. | June |
| J. F. Geisendorfer | 6,000 | Headwaters Wooley Creek, Placer County | June |
| Dr. W. M. Tryon | 6,000 | Green Valley Creek, Placer County | June |
| J. B. Knapp | 6,000 | Canyon Creek and North Fork American River, Placer County. | June |
| H. M. Freeman | 42,000 | South Yuba River, Placer County | June |
| A. S. Nichols | 24,000 | Feather River, Sierra County | June |
| Lake Tahoe Railway and Transportation Co. | 48,000 | Blackwood Creek and Truckee River, Placer County. | June |
| Harmon Bell | 36,000 | Sweetbriar Creek, Shasta County | June |
| Jerry Buckley | 30,000 | Battle Creek, Shasta County | June |
| Lee Richardson | 18,000 | Mud Creek, Butte County | June |
| Nevada City Hunting and Fishing Club. | 60,000 | Deer, Rock, Little Deer and Woods ravine creeks, Nevada County. | June |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF RAINBOW TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------|--------------------|
| F. G. Brown..... | 24,000 | Oregon Creek, Sierra County..... | June |
| Meek Mercantile Com- pany. | 36,000 | Oregon Creek, Yuba County..... | June |
| L. Y. Coggins..... | 21,000 | Dobkins Lake and North Fork Eddy Creek, Siskiyou County. | June |
| E. C. Lloyd..... | 36,000 | Parks Creek, Siskiyou County..... | June |
| H. H. Hudson..... | 30,000 | Little Shasta River, Siskiyou County..... | June |
| California Fish and Game Commission. | 300,000 | Klamath River, Siskiyou County..... | June |
| Kennett Athletic Club..... | 15,000 | Big Backbone Creek, Shasta County..... | June |
| C. L. Watson..... | 30,000 | Clear Creek, Shasta County..... | June |
| J. H. Bradley..... | 18,000 | Antelope Creek, Tehama County..... | June |
| E. Meybem..... | 24,000 | Butte Creek, Butte County..... | June |
| A. C. Musselman..... | 18,000 | Little Butte and Mosquito creeks, Butte County. | June |
| W. J. Whittier..... | 60,000 | West branch of North Fork Feather River, Butte County. | June |
| B. F. Kaufman..... | 35,000 | Little West branch North Fork of Feather River, Butte County. | June |
| P. H. Dunbar..... | 30,000 | Big Nimshew and west branch Feather River Butte County. | June |
| Clay Buchanan..... | 35,000 | Little Nimshew, Big Nimshew and Last Chance creeks, Butte County. | June |
| Elizabeth G. Stevenson..... | 12,000 | Butte Creek, Butte County..... | June |
| Santa Clara Co. Fish and Game Protective Asso- ciation. | 30,000 | Sweijert, Almaden, Guadalupe, Penetentia and Saratoga creeks, Santa Clara County. | June |
| J. H. Livermore..... | 9,000 | Bear Gulch Creek, San Mateo County..... | June |
| Ocean Shore Railroad Company. | 45,000 | Pedro, Tunitas, Frenchman and Higgins, Lo- bitas, and Purissima creeks, San Mateo County. | June |
| J. Boshoff..... | 60,000 | Peseadero, Butano and Gazos creeks, San Mateo County. | June |
| J. A. Owen..... | 24,000 | South Fork Cottonwood Creek, Tehama County. | June |
| Chas. H. Glenn..... | 30,000 | Mill Creek and South, Middle and North Forks of Stony Creek, Colusa County. | June |
| Phil. T. Laugenour..... | 42,000 | Cache and Allen creeks, Yolo County..... | June |
| Bartlett Springs Com- pany. | 30,000 | Cache, Bartlett, Mill and Twin Valley creeks, Lake County. | June |
| Alameda County Fish and Game Protective Association. | 12,000 | Trout Creek, Alameda County..... | June |
| Earle Downing..... | 12,000 | Stony Brook and Alameda Creek, Alameda County. | June |
| Earle Downing..... | 12,000 | Tributaries of Valpe and Arroyo Valle, Ala- meda County. | June |
| Earle Downing..... | 36,000 | La Costa, Indian, Alameda, Bear and Apper- son creeks, Alameda County. | June |
| Earle Downing..... | 24,000 | San Lorenzo, Bolinas and Palomar creeks, Alameda County. | June |
| H. H. Zimmerman..... | 12,000 | Mill Creek, Tehama County..... | July |
| Fred Werner..... | 18,000 | Sutter Creek, Amador County..... | July |
| Geo. F. Zentgraf..... | 12,000 | South Fork American River, El Dorado County. | July |
| M. A. Miller..... | 12,000 | South Fork American River, El Dorado County. | July |
| W. R. Stearns..... | 15,000 | Sonoma Creek, Sonoma County..... | July |
| City of Vallejo..... | 30,000 | Lake No. 2 and in creek between Dam No. 1 and Dam No. 2, Solano County. | July |
| Mrs. Geo. Farley, Jr..... | 6,000 | Kelsey Creek, Lake County..... | July |
| John P. Orr..... | 9,000 | Soseol Creek, Napa County..... | July |
| Joshua Spires..... | 24,000 | Marlo, Spiguet and Big Canyon creeks, Lake County. | July |
| Wm. West and D. S. Keyser. | 72,000 | Milliken Creek, Napa County..... | July |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF RAINBOW TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|--------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------|--------------------|
| B. G. Dichman..... | 9,000 | Clear Creek, Napa County..... | July |
| Sierra and San Francisco Power Company..... | 42,000 | Indian and Clarks creeks and Middle Fork Stanislaus River, Tuolumne County. | July |
| Geo. F. Conlin..... | 36,000 | South Fork Stanislaus River, Tuolumne County. | July |
| R. B. Shaw and H. M. De Ferrari..... | 24,000 | South and Middle Forks Tuolumne River, Tuolumne County. | July |
| J. O. Bigelow..... | 24,000 | Basin Creek, Tuolumne County..... | July |
| D. E. Roberts..... | 36,000 | North Fork Stanislaus River, Beaver, San Antone and O'Neal creeks, Calaveras County. | July |
| F. L. Dimock..... | 36,000 | Sacramento River, Shasta County..... | July |
| G. W. Vestal..... | 9,000 | South Fork Cottonwood Creek, Tehama County. | July |
| S. V. Baron..... | 24,000 | Mill Creek, Tehama County..... | July |
| E. W. Elfendahl..... | 30,000 | Slate Creek, Shasta County..... | July |
| Dr. Wm. Tryon..... | 6,000 | Green Valley Creek, Placer County..... | July |
| W. J. Hall..... | 12,000 | Bear River, Placer County..... | July |
| W. C. Murdoch..... | 21,000 | Tributary of Webber Lake, Sierra County.... | July |
| Miss Katherine Chandler.. | 12,000 | Five Lakes, Bear and Squaw creeks, Placer County. | July |
| Glen Alpine Springs Company..... | 15,000 | Susie Lake, El Dorado County..... | July |
| Al Tahoe Company..... | 12,000 | Trout and Cole creeks, El Dorado County.... | July |
| Mrs. G. W. Kenney..... | 18,000 | Independence Lake, Nevada County..... | July |
| Lawrence & Comstock.... | 6,000 | Small lakes and streams near Tallac, El Do- rado County. | July |
| Tahoe Vista Investment Company..... | 9,000 | Griff Creek, Placer County..... | July |
| H. E. Cagwin..... | 12,000 | Upper and Lower Echo lakes, El Dorado County. | July |
| Santa Clara County Fish and Game Protective Association..... | 114,000 | Planted in the streams of Santa Clara County | July |
| John L. D. Roberts..... | 72,000 | The mountain and coast streams of Monterey County. | July |
| Dan McCloskey..... | 18,000 | Dos Picachos, Bird and Los Muertos creeks, San Benito County. | July |
| H. G. Porter..... | 27,000 | North Fork Feather River, Plumas County.... | July |
| H. L. Beecroft..... | 6,000 | Grizzly Creek, Ice Lake, Plumas County.... | July |
| Frank P. Cady..... | 15,000 | Susan River and Silver and Caribou lakes, Lassen County. | July |
| F. D. Hall..... | 5,000 | Willow Creek, Lassen County..... | July |
| Wm. E. Vincent..... | 7,500 | Secret Creek, Lassen County..... | July |
| Dr. C. M. Tinsman..... | 15,000 | Ash Creek, Modoc County..... | July |
| Chas. W. Williams..... | 7,500 | Parker Creek, Modoc County..... | July |
| Geo. D. Campbell..... | 5,000 | East Creek, Modoc County..... | July |
| L. H. Sisson..... | 5,000 | South Fork Mill Creek, Modoc County..... | July |
| Wm. W. Ahl..... | 10,000 | Fitzhugh Creek, Modoc County..... | July |
| E. E. Aule..... | 10,000 | Fitzhugh Creek, Modoc County..... | July |
| I. Lauer..... | 7,500 | Pine Creek, Modoc County..... | July |
| C. W. Williams..... | 25,000 | South Fork Pitt River, Modoc County..... | July |
| W. L. Leland..... | 7,500 | Antelope, Bottle and Willow creeks, Modoc County. | July |
| S. F. Ballard..... | 10,000 | Thomas Creek, Modoc County..... | July |
| Ira Hansen..... | 7,500 | Parker Creek, Modoc County..... | July |
| H. O. Wickers..... | 36,000 | Sacramento River, Shasta County..... | July |
| A. F. Stoner..... | 24,000 | Tejon Creek, Kern County..... | July |
| W. A. Wirth..... | 45,000 | North Fork Kern River, Kern County..... | July |
| Hall & McAfee..... | 21,000 | Baker, Big Pine, Little Pine, Birch and Tin- nemaha creeks, Big Pine Lake and Red Mountain lakes, Inyo County. | July |
| Sisson Promotion Asso- ciation..... | 75,000 | Sullaway and Big Spring creeks, and North Fork Sacramento River, Siskiyou County. | July |
| Geo. Neale..... | 12,000 | Battle Creek, Tehama County..... | July |
| W. B. Engle..... | 39,000 | Shepherds Creek, Inyo County..... | July |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF RAINBOW TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Mrs. M. A. Bruley..... | 18,000 | Sacramento River, Shasta County..... | August |
| A. Davies..... | 9,000 | Little Truckee River, Nevada County..... | August |
| R. G. Buchanan..... | 6,000 | Walker River, Mono County..... | August |
| J. S. Cain..... | 12,000 | Walker River, Mono County..... | August |
| North Fork Association..... | 24,000 | North Fork American River, Placer County... | August |
| A. G. McFarland..... | 12,000 | South Fork Yuba River, Placer County..... | August |
| Webber Lake Club..... | 12,000 | Tributary Webber Lake, Nevada County..... | August |
| J. E. Powell..... | 6,000 | Walker River and Lost Caution, Mono County | August |
| C. W. Rickey..... | 6,000 | Walker River and Big Slough, Mono County.. | August |
| Euell Gray..... | 72,000 | Silver, Sly, Park and Alder creeks, Ogilvie Canyon and American River, El Dorado County. | August |
| J. M. Amick..... | 18,000 | Mokelumne and Bear rivers and South Fork Cosumnes, Amador County. | August |
| C. S. Wilson..... | 18,000 | Indian, Reddings, Browns, East Weaver and Rush creeks, Trinity County. | August |
| J. W. Metcalf..... | 60,000 | Sacramento River, Shasta County..... | August |
| F. O. Branstetter..... | 36,000 | Sacramento River, Siskiyou County..... | August |
| D. E. Roberts..... | 30,000 | Middle Fork Calaveras River, Calaveras County. | August |
| I. O. Jillson..... | 24,000 | Crystal, Willow and Clear creeks and Klines Guleh, Shasta County. | August |
| California Door Company. | 15,000 | North and Middle Forks Cosumnes River, Steeley Fork, Middle, McKinney's, Dog Town and Cut creeks, El Dorado County. | August |
| James Dodds..... | 18,000 | El Dorado, Blaek, Seeret and Humbug canyons, Placer County. | August |
| Geo. E. King..... | 15,000 | Woodruth and Rock creeks and North, East and South Forks of North Yuba River, Sierra County. | August |
| R. Colwell..... | 12,000 | Rubicon River and Rock Bound Lake, El Dorado County. | August |
| Glen Alpine Springs Company. | 15,000 | Glen Alpine Creek and Grass, Susie and Heather lakes, El Dorado County. | August |
| Mayo A. Greenlaw..... | 9,000 | Echo Lake, El Dorado County..... | August |
| W. W. Price..... | 12,000 | Witches Cave and Floating Island, Cathedral, Upper and Lower Angora lakes and Glen Alpine Creek, El Dorado County. | August |
| Grass Valley Sportsmen's Club. | 60,000 | Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County. | August |
| Lawrence & Comstock.... | 9,000 | Floating Island and Angora lakes, El Dorado County. | August |
| Bert Berry..... | 9,000 | Poro Creek, Tulare County..... | September |
| Widgeon Gun Club..... | 42,000 | Kaweah River, Tulare County..... | September |
| John Fitzpatrick..... | 18,000 | San Benito Creek, Fresno County..... | September |
| Porterville Fish and Game Protective Association. | 72,000 | Redwood, Kessing, Belnap, Boulder and McIntyre creeks, Tulare County. | September |
| Deer Creek Fish and Game Protective Association. | 24,000 | North and South Deer creeks, Tulare County.. | September |
| T. A. Chatten..... | 27,000 | Eagle Creek, East Fork Kaweah and Franklin lakes, Tulare County. | September |
| H. G. McCaughey..... | 24,000 | Salmon Creek, Sonoma County..... | September |
| C. G. Boldsdorf..... | 27,000 | Russian River, Sonoma County..... | September |
| W. A. Sperry..... | 18,000 | Grizzly Creek and Clover Valley, Plumas County. | September |
| Con Roman..... | 6,000 | Cheda Creek, Marin County..... | September |
| W. A. Jinkerson..... | 30,000 | North, Middle and South Forks Cosumnes River, El Dorado County. | September |
| E. A. Pearce..... | 9,000 | San Juan Canyon Creek, San Benito County.. | September |
| Monterey Fish and Game Protective Association. | 30,000 | Rocky, Mill, Miller, Garapatas and Cocagua creeks, Monterey County. | September |
| S. E. Whiteher..... | 24,000 | Arroyo Seco, Monterey County..... | September |
| J. H. Hollister..... | 60,000 | Upper San Luis, Torro, Marro, San Luisito, Charro, Corral de Piedra, See Canyon, Coon and Welsh creeks, San Luis Obispo County. | September |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF RAINBOW TROUT—*Continued.*

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|-------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Dr. C. S. Noble and others. | 24,000 | Lopez, Arroyo Grande and Tar Spring creeks, San Luis Obispo County. | September |
| H. J. Abels..... | 15,000 | Sisquoc and Manzanera rivers and Birabut creek, Santa Barbara County. | September |
| H. J. Doulton..... | 30,000 | Santa Ynez River and tributaries, Santa Barbara County. | September |
| H. S. Deaderick..... | 9,000 | Rincon, Gilis and Bloodo creeks, Santa Barbara County. | September |
| Jas. Rasmussen and Sim Myers. | 95,000 | Coyote Creek, Ventura River and North Fork San Antonio Creek, Ventura County. | September |
| C. E. Carr..... | 24,000 | Trinity River, Trinity County..... | October |
| Yosemite Valley Railroad | 78,000 | Merced River, Merced County..... | October |
| Major Wm. W. Forsyth. | 24,000 | Merced River, Mariposa County..... | October |
| W. M. Avis..... | 21,000 | San Dimas, Wolfskill and Palmer canyons and Recreation Run, Los Angeles County. | October |
| W. J. Sanborn..... | 18,000 | Bear and Ice House canyons and San Antonio River, Los Angeles County. | October |
| E. D. Silent..... | 24,000 | Malibu Creek, Los Angeles County..... | October |
| Geo. E. Little..... | 12,000 | Rio Hondo and San Jose creeks, Los Angeles County. | October |
| W. G. Kerekhoff..... | 45,000 | San Antonio Creek, Los Angeles County..... | October |
| Jas. A. Vale..... | 120,000 | Lytle, Devoir, Cable, City, Plunge, Bear, Mill, Salfrit, Creeley, Huston, Grass Valley, Little Bear, Hook, Deep, and Holcomb creeks and Devil and Waterman canyons, San Bernardino County. | October |
| Strong & Dickenson..... | 12,000 | Strawberry Creek, Riverside County..... | October |
| John Shaver..... | 15,000 | South and North Forks San Jacinto River, Riverside County. | October |
| H. W. O'Melveney..... | 105,000 | San Gabriel River, Los Angeles County..... | October |
| Will E. Chapin..... | 12,000 | Big Tejunga Creek, Los Angeles County..... | October |
| Albert Cummings..... | 12,000 | Cummings Creek, Kern County..... | October |
| Webb Toms..... | 21,000 | Santa Ysabel, Cedar, Cottonwood and Boulder creeks, San Diego County. | October |
| Jas. A. Vale..... | 6,000 | Whitewater Creek, San Bernardino County..... | October |
| F. A. Forster..... | 15,000 | San Juan, Mission, Viejo and San Juan Hot Springs creeks, Orange County. | October |
| B. L. Crise..... | 18,000 | Pauma Creek, San Diego County..... | October |
| H. I. Pritchard..... | 12,000 | Topango Creek, Los Angeles County..... | October |
| W. K. Robinson..... | 24,000 | Tobacco, Santiago and Silverado creeks, Orange County. | October |
| A. Stacy..... | 9,000 | Cold Water Canyon, Riverside County..... | October |
| E. B. Collier..... | 9,000 | Malibu Canyon, Riverside County..... | October |
| Ed. Fletcher..... | 9,000 | San Luis Rey River, San Diego County..... | October |
| W. C. Davidson..... | 18,000 | Garcia River and Saunders Creek, Mendocino County. | October |
| Chas. Wright..... | 50,000 | Cold Creek, Siskiyou County..... | October |
| Otas E. Pile..... | 18,000 | Butte Creek and Oris Lake, Siskiyou County..... | October |
| A. D. Shepard..... | 30,000 | Soda Creek, Shasta County..... | October |
| Forest Service..... | 24,000 | Pilgrim Creek, Siskiyou County..... | October |
| J. N. Dobkins..... | 12,000 | Shasta River, Siskiyou County..... | October |
| Fish and Game Commission. | 30,000 | Big Spring Creek, at Rupps Lake, Siskiyou County. | October |
| Fish and Game Commission. | 75,000 | Sacramento River, Siskiyou County..... | October |
| W. W. Morgan..... | 24,000 | Antelope Creek, Tehama County..... | October |
| Fish and Game Commission. | 214,670 | Klamath River, Siskiyou County..... | October |
| Fish and Game Commission. | 78,000 | Sacramento River, Shasta County..... | October |
| L. W. Fouquier..... | 30,000 | Shasta River, Siskiyou County..... | October |
| | 50,000 | In Klinks Lake, for Sisson Hatchery. | |
| | 25,000 | In ponds at Sisson Hatchery. | |
| | 75,000 | In Sisson Lake, for Sisson Hatchery. | |
| Total..... | 5,950,670 | | |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF STEELHEAD TROUT (*Salmo gairdneri*).

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|----------------------------------------------------------|---------|----------------------------------------------------------------------------------------|--------------------|
| North Fork Game Protective Association. | 60,000 | North and Middle Forks American River, Owl Creek and Gas Canyon Creek, Placer County. | June |
| Ocean Shore Railroad Company. | 102,000 | Pedro, Tunitas, Frenchman and Higgins, Lobitas and Purissima creeks, San Mateo County. | June |
| Joseph B. Fleming----- | 18,000 | San Pedro Creek, San Mateo County----- | June |
| J. Boshoff----- | 30,000 | Pescadero, Butano and Gazos creeks, San Mateo County. | June |
| Earle Downing----- | 18,000 | Mocho Creek, Alameda County----- | June |
| Geo. F. Zentgraf----- | 12,000 | South Fork American River, El Dorado County. | July |
| Earle Downing----- | 18,000 | San Leandro and Ivy creeks, Alameda County | June |
| M. A. Miller----- | 12,000 | South Fork American River, El Dorado County. | June |
| W. R. Stearns----- | 9,000 | Sonoma Creek, Sonoma County----- | June |
| John P. Orr----- | 9,000 | Soscol Creek, Napa County----- | June |
| B. G. Dichman----- | 9,000 | Clear Creek, Napa County----- | June |
| Santa Clara County Fish and Game Protective Association. | 12,000 | Distributed in streams of Santa Clara County | June |
| Dan McCloskey----- | 18,000 | Dos Picachos, Bird Creek and Los Muertos, San Benito County. | June |
| C. G. Bolsdorff----- | 9,000 | Russian River, Sonoma County----- | September |
| Fish and Game Commission. | 25,000 | Big Spring Creek at Rupps Lake, Siskiyou County. | October |
| Total----- | 361,000 | | |

SISSON HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF LARGE LAKE TROUT (*Salmo m. tahoensis*).

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|----------------------------------------|---------|-------------------------------------|--------------------|
| Nevada, California and Oregon Railway. | 15,000 | Goose Lake, Modoc County----- | July |
| A. D. Shepard----- | 15,000 | Castle Lake, Siskiyou County----- | September |
| G. A. Caswell----- | 24,000 | Medicine Lake, Siskiyou County----- | September |
| Z. Abrams----- | 30,000 | Abrams Lake, Siskiyou County----- | October |
| Total----- | 84,000 | | |

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawi*).

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|---------------------------|---------|------------------------------------------------------------------------------------------------|--------------------|
| H. L. Beeroft..... | 6,000 | Grizzly Creek and Ice Lake, Plumas County..... | July |
| J. N. Durney..... | 15,000 | Mt. Eddy Lake, Siskiyou County..... | July |
| Perey Lovejoy..... | 15,000 | Mt. Eddy Lake, Siskiyou County..... | July |
| Euell Gray..... | 120,000 | Cody, Right, Dark, Blood, Echo, Succor and Andrian lakes and American River, El Dorado County. | September |
| A. D. Shepard..... | 60,000 | Castle Lake, Siskiyou County..... | September |
| Z. Abrains..... | 20,000 | Abrams Lake, Siskiyou County..... | September |
| Otas E. Pile..... | 7,500 | Butte Creek and Oris Lake, Siskiyou County.. | October |
| C. M. Parker..... | 9,000 | Back Fence, Kangaroo, Bull and Secret lakes, Siskiyou County. | October |
| Fred Sullaway..... | 30,000 | Wagon Creek, Siskiyou County..... | October |
| Fish and Game Commission. | 20,000 | Big Spring Creek at Rapps Lake, Siskiyou County. | October |
| B. L. Crise..... | 6,000 | Pauma Creek, San Diego County..... | October |
| | 10,000 | Held in hatchery ponds, Sisson. | |
| Total..... | 318,500 | | |

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF QUINNAT SALMON.

| Date. | Waters stocked. | Number. |
|-------------|-----------------------------------------------------------------|-----------|
| February 23 | Cold Creek, Siskiyou County..... | 357,700 |
| April 2 | Klamath River at Hornbrook, Siskiyou County..... | 350,000 |
| April 4 | Sacramento River at Dunsuir, Siskiyou County..... | 350,000 |
| April 4 | Sent to Sacramento to be marked, Sacramento County..... | 50,000 |
| April 18-30 | Cold and Sullaway creeks, Siskiyou County..... | 912,665 |
| April 6 | Flume Creek, tributary to Sacramento River, Shasta County..... | 350,000 |
| April 8 | Sacramento River at Lamoine, Shasta County..... | 350,000 |
| April 9 | Sacramento River at Delta, Shasta County..... | 350,000 |
| April 9 | Cold and Sullaway creeks, Siskiyou County..... | 603,735 |
| April 11 | Sacramento River at Delta, Shasta County..... | 350,000 |
| April 15 | Cold Creek, tributary to Sacramento River, Siskiyou County..... | 334,855 |
| April 23 | Sacramento River at Delta, Shasta County..... | 350,000 |
| May 1 | Cold Creek, tributary to Sacramento River, Siskiyou County..... | 87,900 |
| May 1 | Cold Creek, tributary to Sacramento River, Siskiyou County..... | 294,075 |
| May 16 | Sisson Lake, Siskiyou County..... | 287,650 |
| May 17 | Sisson Lake, Siskiyou County..... | 763,975 |
| Total..... | | 6,142,555 |

TAHOE HATCHERIES.

*Fish Distribution, Season 1912.*DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

| Date. | Waters stocked. | Number. |
|--------------|-----------------------------------------|---------|
| July 30 | Truckee River, Placer County..... | 66,300 |
| August 4 | Ward Creek, Placer County..... | 80,000 |
| August 7 | Slim Jim Creek, Placer County..... | 70,000 |
| August 17 | Griffin Creek, Placer County..... | 50,000 |
| August 28 | Truckee River, Placer County..... | 30,000 |
| August 29 | Independence Lake, Sierra County..... | 40,000 |
| September 5 | Ward Creek, Placer County..... | 42,000 |
| September 12 | Richardson Lake, El Dorado County..... | 35,000 |
| September 13 | Summit Lake, Nevada County..... | 20,000 |
| September 13 | Lake Stirling, Nevada County..... | 40,000 |
| September 13 | Truckee River, Placer County..... | 40,000 |
| September 14 | Donner Lake, Nevada County..... | 45,000 |
| September 15 | Donner Lake, Nevada County..... | 45,000 |
| September 15 | Burton Creek, El Dorado County..... | 10,000 |
| September 18 | Rubicon River, El Dorado County..... | 40,000 |
| September 18 | Richardson Lake, El Dorado County..... | 30,000 |
| September 18 | Webber Lake, Sierra County..... | 60,000 |
| September 19 | Webber Lake, Sierra County..... | 30,000 |
| September 19 | Donner Lake, Nevada County..... | 15,000 |
| September 22 | Blackwood Creek, Placer County..... | 35,000 |
| September 23 | Blackwood Creek, Placer County..... | 50,000 |
| September 26 | Blackwood Creek, Placer County..... | 60,000 |
| September 27 | Ward Creek, Placer County..... | 30,000 |
| October 1 | Rock Bound Lakes, El Dorado County..... | 25,500 |
| October 7 | Experimental work in Nevada County..... | 1,337 |
| | Total | 993,137 |

TALLAC HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

| Date. | Waters stocked. | Number. |
|---------|---------------------------------------------|-----------|
| June 22 | Taylor Creek, El Dorado County..... | 95,000 |
| June 23 | Taylor Creek, El Dorado County..... | 40,000 |
| June 25 | Tallac Creek, El Dorado County..... | 62,000 |
| June 25 | Fallen Leaf Lake, El Dorado County..... | 62,000 |
| June 29 | Tallac Creek, El Dorado County..... | 62,000 |
| June 29 | Fallen Leaf Lake, El Dorado County..... | 62,000 |
| July 2 | Tallac Creek, El Dorado County..... | 126,000 |
| July 3 | Powerhouse ditch, El Dorado County..... | 71,000 |
| July 5 | Fallen Leaf Lake, El Dorado County..... | 79,000 |
| July 6 | Cascade Lake, El Dorado County..... | 62,000 |
| July 9 | Powerhouse ditch, El Dorado County..... | 24,000 |
| July 9 | Cascade Lake, El Dorado County..... | 62,000 |
| July 11 | Tallac Creek, El Dorado County..... | 62,000 |
| July 11 | Fallen Leaf Lake, El Dorado County..... | 62,000 |
| July 12 | Little Truckee River, El Dorado County..... | 40,000 |
| July 13 | Cascade Lake, El Dorado County..... | 62,000 |
| July 13 | Taylor Creek, El Dorado County..... | 69,840 |
| July 16 | Taylor Creek, El Dorado County..... | 68,000 |
| July 16 | Powerhouse ditch, El Dorado County..... | 68,000 |
| July 21 | Taylor Creek, El Dorado County..... | 68,011 |
| | Total | 1,306,851 |

TALLAC HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF LARGE LAKE TROUT (*Salmo m. tahocensis*).

| Date. | | Waters stocked. | Number. |
|-------------|----|---------------------------------------------------------|---------|
| June | 29 | Fallen Leaf Lake, El Dorado County..... | 14,000 |
| July | 11 | Fallen Leaf Lake, El Dorado County..... | 28,000 |
| July | 12 | Little Truckee River, El Dorado County..... | 14,000 |
| July | 13 | Cascade Lake, El Dorado County..... | 14,000 |
| July | 16 | Taylor Creek, El Dorado County..... | 20,000 |
| July | 22 | Meyers Creek, El Dorado County..... | 35,000 |
| July | 23 | Taylor Creek, El Dorado County..... | 28,000 |
| July | 24 | Grass Lake, El Dorado County..... | 35,000 |
| July | 25 | Cascade Lake, El Dorado County..... | 35,000 |
| July | 25 | Little Truckee and Angora creeks, El Dorado County..... | 35,000 |
| July | 26 | Cascade Lake, El Dorado County..... | 52,221 |
| Total | | | 310,221 |

GLEN ALPINE HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

| Date. | | Waters stocked. | Number. |
|-------------|----|------------------------------------------|---------|
| July | 20 | Lily Lake, El Dorado County..... | 60,000 |
| July | 21 | Grass Lake, El Dorado County..... | 90,000 |
| July | 22 | Susie Lake, El Dorado County..... | 15,000 |
| July | 22 | Heather Lake, El Dorado County..... | 45,000 |
| July | 22 | Gilmore Lake, El Dorado County..... | 45,000 |
| July | 23 | Lucile Lake, El Dorado County..... | 15,000 |
| July | 24 | Half Moon Lake, El Dorado County..... | 60,000 |
| July | 25 | Grass Lake, El Dorado County..... | 30,000 |
| July | 25 | Susie Lake, El Dorado County..... | 60,000 |
| July | 25 | Glen Alpine Lake, El Dorado County..... | 25,649 |
| July | 23 | Lake of the Woods, El Dorado County..... | 30,000 |
| Total | | | 475,649 |

TAHOE HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF EASTERN BROOK TROUT (*Salvelinus fontinalis*).

| Date. | Applicant. | Number. | Waters stocked. |
|-------------|------------------------------------------------|---------|--------------------------------------------|
| Sept. 5 | R. Colwell | 4,500 | Rubicon River, El Dorado County. |
| Sept. 12 | Lawrence & Comstock..... | 5,000 | Velma and Granite lakes, El Dorado County. |
| Sept. 13 | F. Gowling | 1,500 | Summit Lake, Nevada County. |
| Sept. 15 | A. Buckman | 900 | Cold Stream, Nevada County. |
| Sept. 16 | Lake Tahoe Railway and Transportation Company. | 2,800 | Watson Lake, Placer County. |
| Sept. 17 | Lake Tahoe Railway and Transportation Company. | 2,800 | Watson Lake, Placer County. |
| Sept. 18 | F. Pomin | 1,500 | Richardson Lake, El Dorado County. |
| Sept. 18 | R. Colwell | 2,800 | Rubicon River, El Dorado County. |
| Sept. 20 | Lake Tahoe Railway and Transportation Company. | 1,600 | Watson Lake, Placer County. |
| Sept. 22 | Lake Tahoe Railway..... | 1,500 | Baker Creek, Placer County. |
| Sept. 30 | R. Kopke | 1,000 | Truckee River, Nevada County. |
| Total | | 25,300 | |

UKIAH HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF STEELHEAD TROUT.

| Date. | Applicant. | Number. | Waters stocked. |
|-----------------------------------------------------|-------------------------------------------------------|---------|---------------------------------------------------|
| June 4 | C. N. Cox..... | 10,000 | Ore Creek, Mendocino County. |
| June 4 | G. A. Johnson..... | 10,000 | Cold Creek, Mendocino County. |
| June 5 | S. J. Holliday..... | 12,000 | Ackerman Creek, Mendocino County. |
| June 6 | W. C. White..... | 14,000 | Reeves Creek, Mendocino County. |
| June 7 | A. L. Gibson..... | 16,000 | Robinson Creek, Mendocino County. |
| June 7 | John L. Orr..... | 10,500 | Big River, Mendocino County. |
| June 8 | H. M. Whilley..... | 15,000 | Indian Creek, Mendocino County. |
| June 8 | Elliott B. Davis..... | 15,000 | Indian Creek, Mendocino County. |
| June 8 | Dr. C. O. Edwards..... | 15,000 | Navarro River, Mendocino County. |
| June 12 | C. M. Manon..... | 10,000 | Jack Smith Creek, Mendocino County. |
| June 13 | California Western Railway and Navigation Company. | 50,000 | Noyo River, Mendocino County. |
| June 19 | H. M. Kemp..... | 25,000 | Blue Lakes, Lake County. |
| July 10 | California Anglers Association..... | 50,000 | Sonoma Creek, Sonoma County. |
| July 13 | California Anglers Association..... | 50,000 | Sulphur Creek, Sonoma County. |
| July 17 | California Anglers Association..... | 28,000 | Austin Creek, Sonoma County. |
| July 20 | California Anglers Association..... | 75,000 | Paper Mill and Lagunitas creeks, Marin County. |
| July 26 | California Anglers Association..... | 27,958 | Russian River, Mendocino County. |
| | Total | 433,458 | |
| Total steelhead eggs shipped to Ukiah Hatchery..... | | | 470,000 |
| Total loss of eggs and fry..... | | | 36,542 |
| Number planted | | | 433,458 |

WAWONA HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT.

| Date. | Applicant. | Number. | Waters stocked. |
|---------|-----------------------------------|---------|----------------------------------------------------------------|
| June 25 | Dr. A. H. Byers..... | 8,757 | Lewis and Hogue creeks, Madera County. |
| June 27 | Dr. A. H. Byers..... | 23,352 | Thompson and Big creeks, Mariposa County. |
| June 28 | B. H. Mace..... | 5,838 | Devils Canyon, Mariposa County. |
| June 29 | E. T. Huffman..... | 5,838 | Miami Creek, Madera County. |
| June 29 | A. C. Shaw..... | 5,838 | Woodward Creek, Madera County. |
| July 5 | B. H. Mace..... | 2,919 | Conway Creek, Mariposa County. |
| July 13 | E. T. Huffman..... | 11,676 | Miami Creek, Madera County. |
| July 15 | B. Galispe..... | 23,352 | Meadow Creek and Stella Lake, Mari- posa County. |
| July 16 | F. C. Boyce..... | 8,757 | Merced River, Mariposa County. |
| July 23 | J. C. Westfall..... | 2,919 | Oliver Creek, Mariposa County. |
| July 24 | J. C. Westfall..... | 5,838 | Grizzly and Grouse creeks, Mariposa County. |
| July 30 | United States Government agents.. | 17,514 | Ostrander Lake, Mariposa County. |
| July 30 | J. C. Westfall..... | 5,838 | Owl Creek and South Fork Chowchilla River, Mariposa County. |
| July 31 | J. C. Westfall..... | 5,838 | South Fork Chowchilla River, Mariposa County. |
| Aug. 1 | J. S. Washburn..... | 46,704 | South Fork Merced River, Mariposa County. |
| Aug. 2 | E. T. Huffman..... | 5,838 | Miami Creek, Madera County. |
| Aug. 2 | A. C. Shaw..... | 5,838 | Grove Creek, Madera County. |
| Aug. 2 | F. C. Boyce..... | 23,352 | Big Creek, Mariposa County. |
| | Total | 216,006 | |

WAWONA HATCHERY.

*Fish Distribution, Season 1912.*DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

| Date. | Applicant. | Number. | Waters stocked. |
|---------|-----------------------------------|---------|---------------------------------------------|
| July 5 | B. H. Mace..... | 5,203 | Conway Creek, Mariposa County. |
| July 23 | J. C. Westfall..... | 5,203 | Oliver Creek, Mariposa County. |
| July 24 | J. C. Westfall..... | 10,406 | Grizzly and Grouse creeks, Mariposa County. |
| July 25 | United States Government agents.. | 52,030 | Grouse and Crescent creeks, Madera County. |
| July 26 | United States Government agents.. | 41,624 | Bridal Veil Creek, Mariposa County. |
| | Total | 114,463 | |

DISTRIBUTION OF LARGE-MOUTH BLACK BASS.

(By Fish Car.)

| Applicant. | Number. | Waters stocked. | Month of delivery. |
|------------------------------|---------|-----------------------------------------------|--------------------|
| M. H. Stitt..... | 230 | Cache Creek, Yolo County..... | Aug. 28 |
| Chas. Domenghini | 120 | Emery Reservoir, Calaveras County..... | Aug. 30 |
| Chester A. Seroggs | 100 | Laird Mine Hole, Placer County..... | Sept. 1 |
| A. D. Shaw..... | 75 | Lane Lake, San Benito County..... | Sept. 2 |
| W. P. Kelley..... | 100 | Lake Lagloria, Monterey County..... | Sept. 2 |
| A. H. Fowler..... | 125 | Black Lake, San Luis Obispo County..... | Sept. 3 |
| W. H. Graves..... | 90 | Hughes Lake, Los Angeles County..... | Sept. 4 |
| Niles R. Turner..... | 110 | Turners Lake, San Bernardino County..... | Sept. 4 |
| Los Angeles Park Commission. | 800 | Hollenbeck Park Lake, Los Angeles County..... | Sept. 5 |
| Total | 1,750 | | |

Following is a summary of the distribution from the different hatcheries for the season of 1912:

Sisson Hatchery.

Trout eggs collected from the ponds and substations and received from other hatcheries:

| | Eggs. | Loss. | Shipped to other stations. | Fry shipped and held for breeding. | Total shipped and held for breeding. |
|--------------------------|-----------|---------|----------------------------|------------------------------------|--------------------------------------|
| Loch Leven trout..... | 1,500,000 | 206,500 | ----- | 1,293,500 | ----- |
| Eastern brook trout..... | 1,000,000 | 94,000 | ----- | 906,000 | ----- |
| Rainbow trout..... | 6,994,000 | 818,330 | 225,000 | 5,950,670 | ----- |
| Steelhead trout..... | 416,600 | 55,600 | ----- | 361,000 | ----- |
| Large lake trout..... | 92,922 | 8,922 | ----- | 84,000 | ----- |
| Black-spotted trout..... | 370,164 | 51,664 | ----- | 318,500 | 8,913,670 |
| Salmon..... | 6,340,000 | 197,445 | ----- | 6,142,555 | 6,142,555 |
| | | | | | 15,056,225 |

Tahoe Hatcheries.

| | | | | | |
|--------------------------|-----------|---------|---------|-----------|-----------|
| Black-spotted trout..... | 3,610,622 | 342,821 | 492,164 | 2,775,637 | ----- |
| Large lake trout..... | 542,761 | 139,618 | 92,922 | 310,221 | ----- |
| Eastern brook trout..... | ----- | ----- | ----- | 25,300 | 3,111,158 |

Brookdale Hatchery.

| | | | | | |
|----------------------|-----------|---------|-----------|---------|---------|
| Steelhead trout..... | 2,709,300 | 603,200 | 1,302,600 | 803,500 | 803,500 |
|----------------------|-----------|---------|-----------|---------|---------|

Price Creek Hatchery.

| | | | | | |
|----------------------|-----------|--------|-------|-----------|-----------|
| Steelhead trout..... | 618,000 | 38,000 | ----- | 580,000 | ----- |
| Salmon..... | 3,240,000 | 36,340 | ----- | 3,203,660 | 3,783,660 |

Ukiah Hatchery.

| | | | | | |
|----------------------|---------|--------|-------|---------|---------|
| Steelhead trout..... | 470,000 | 36,542 | ----- | 433,458 | 433,458 |
|----------------------|---------|--------|-------|---------|---------|

Wawona Hatchery.

| | | | | | |
|--------------------------|---------|-------|-------|---------|---------|
| Rainbow trout..... | 225,000 | 8,994 | ----- | 216,006 | ----- |
| Black-spotted trout..... | 122,000 | 7,534 | ----- | 114,466 | 330,472 |

Sacramento Experimental Station.

| | | | | | |
|-------------|-----------|---------|---------|---------|---------|
| Salmon..... | 1,768,000 | 418,000 | 450,000 | 900,000 | 900,000 |
|-------------|-----------|---------|---------|---------|---------|

Mill Creek Station.

| | | | | | |
|-------------|-----------|--------|---------|-----------|-----------|
| Salmon..... | 9,364,550 | 94,320 | 607,000 | 8,663,230 | 8,663,230 |
|-------------|-----------|--------|---------|-----------|-----------|

Black Bass.

| | | | | | |
|--------------------------------------------------------------|-------|-------|-------|-------|-------|
| Adult black bass caught up and distributed for breeders..... | ----- | ----- | ----- | ----- | 1,750 |
|--------------------------------------------------------------|-------|-------|-------|-------|-------|

Total.

| | | | | | |
|-------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------------------|
| Trout distributed and held for breeding in State of California during season of 1912..... | ----- | ----- | ----- | ----- | 14,172,258 |
| Salmon distributed in State of California during season of 1912..... | ----- | ----- | ----- | ----- | 18,909,445 |
| Black bass distributed in State of California during season of 1912..... | ----- | ----- | ----- | ----- | 1,750 |
| Total..... | ----- | ----- | ----- | ----- | 33,083,453 |

Fifty thousand grayling eggs received from U. S. Bureau of Fisheries, at Bozeman, Montana.

Ten thousand grayling fry were shipped to Monterey County, but were lost by applicant.

After the eggs were hatched the fry were placed in one of the ponds at Sisson. They have not been counted and the number remaining in the ponds is not known.

