

# ANNUAL REPORT

OF THE

## Board of Fish and Game Commissioners

FOR THE

974.901  
F63

Year Ending October 31, 1916

---

New Jersey Reformatory Print  
Rahway, N. J.

## LIST OF FISH AND GAME COMMISSIONERS

Holding Office at the Date of This Report

ERNEST NAPIER, *President*,.....East Orange, N. J.  
 WILLIAM A. LOGUE, *Treasurer*,.....Bridgeton, N. J.  
 WILLIAM A. FAUNCE,.....Atlantic City, N. J.  
 BERNARD M. SHANLEY, JR.,.....Newark, N. J.  
 WALTER H. FELL, *Secretary*,

Office of the Board, State House, Trenton, N. J.

### List of Fish and Game Wardens Holding Commissions at the Date of this Report

STRATTON, JAMES M., *Protector*,.....North Long Branch  
 MATHIS, HOWARD, *Assistant Protector*,.....New Gretna  
 CUDNEY, HARRY E., *Assistant Protector*,.....Hackettstown

AVIS, JOHN H.,.....Woodbury  
 BAILEY, JOHN B.,\*.....Washington  
 CONNER, FRED S.,.....Bridgeton  
 COX, JOHN F.,\*.....Washington  
 EVERNHAM, JAMES H.,.....Bayville  
 FOLKER, CHARLES W.,.....Camden  
 HALL, FRED J.,.....Bloomfield  
 HILLIARD, PHINEAS K.,.....Manahawkin  
 HOBLITZEL, WILLIAM,.....Rahway  
 KLEIN, WILLIAM C.,.....Clifton  
 LODER, WILLIAM B.,.....Egg Harbor City  
 LOVELESS, HARRY M.,.....Trenton  
 MORTON, CHARLES C.,.....Mount Holly  
 PARK, JOHN J.,.....White House Station  
 PHIFER, GEORGE W.,.....Ormond  
 RIDER, ANSON J.,.....Tuckerton  
 ROE, JACOB D.,.....Newton  
 SMALL, OTIS C.,.....Hammonton  
 SMALL, WILLIAM HENRY,.....Englewood  
 STEEL, WILLIAM,.....Cape May Court House  
 STEUERWALD, CHARLES,.....South Amboy  
 THOMPSON, DAVID A., JR.,.....Salem  
 THORNE, GARRET P.,.....Holmdel, P. O. Matawan  
 WELSH, CHARLES E.,.....East Millstone  
 WHITE, HARRY W. D.,.....Pennsville  
 YOUNG, WILLIAM E.,.....Chester

\* Temporary.

## LETTER OF TRANSMITTAL.

To His Excellency, James F. Fielder, Governor, and to the Members of the Senate and General Assembly of the State of New Jersey:

As required by law, we submit herewith the annual report of the work of the Board of Fish and Game Commissioners for the year ending October 31st, 1916.

Very respectfully,

ERNEST NAPIER,  
 WILLIAM A. LOGUE,  
 W. A. FAUNCE,  
 B. M. SHANLEY, Jr.,  
*Commissioners.*

## ANNUAL REPORT

Supported solely by proceeds derived from those who hunt and fish in this State, the Board has closed the most successful year of its existence. In no feature of our work was there a step backward, nor did we stand still in any particular. All our activities were broadened and intensified. Proof of all this we confidently believe may be found in the satisfaction expressed by our citizens who are familiar with our administration. We call particular attention to the year's results at our Fish Hatchery and Game Farm, and to our investigation of the shad industry which are detailed in the pages following.

It is becoming better understood that our Board has no authority to review judicial proceedings in fish and game cases. However, appeals are often made to us to remit a penalty where the defendant pleads extreme poverty and even in cases where defendants are possessed of considerable worldly goods. Any failure to administer our law places a premium upon violations, works an injustice to all law-abiding sportsmen and permits the destruction of the natural resources of the State. It has been well said that a person who is prosperous enough to be possessed of a gun and ammunition and takes time to hunt is prosperous enough to pay a penalty for wilful failure to obey the law. If poverty of a defendant were allowed as an excuse a wholesale slaughter of our birds and fish would follow. The true sportsman knows that in the conservation of the remnant of our game and fish lies the opportunity for future pursuit of the same. The members of our Board take an oath to enforce the laws, and the Commissioners take more joy in the thousands of

hunters and fishermen enjoying themselves legally than contemplating one violator penalized or in jail.

**U. S. Federal Migratory Law.**—August 21st President Woodrow Wilson approved amended regulations of the U. S. Department of Agriculture respecting the seasons for migratory birds, which were intended to meet criticisms on seasons already fixed by the Federal authorities.

Considerable criticism is still directed against the Federal seasons, especially in the matter of ducks and shore birds. As to the duck season, fixed from October first to January fifteenth, it is claimed that the season commences too early and closes too soon. As to shore birds, it is claimed that the season should commence August first instead of August fifteenth.

Respecting the expectation of many persons that the U. S. Supreme Court would declare the Federal law unconstitutional, it should be noted, that during 1916 the U. S. Senate ratified a treaty between the United States and Canada for the protection of migratory wild birds. Friends of the treaty take the position that under the United States Constitution and other authority all treaties made shall be the supreme law of the land and the judges in every State shall be bound thereby. The agreements in the present treaty are practically identical with the regulations made under the Federal Migratory Bird Law, and it is stated by William S. Haskell, Counsel for the American Game Protective Association, that the treaty makes it unnecessary to bring the case now pending in the U. S. Supreme Court to argument.

In any reading of the U. S. bulletins on seasons, it must be remembered that a ruling of the Federal authorities is that a date fixed by a State governs the season when the date opens the season later or closes it earlier than the announced Federal seasons.

**Game Refuge.**—The Board executed on the third day of October, 1915, an agreement with the Rossiter Realty Company for the leasing for one dollar for five years, five thousand acres of forest land, known as Buckwood Park, located in Knowlton, Blirstown and Pahaquarry Townships, Warren County, for the purpose of a game refuge. The following clause is taken from the agreement:

"It is understood and agreed by and between the parties hereto that no game shall be killed on the said leased premises by the party of the first part or any one claiming under it, or by the party of the second part or their agents or servants."

The State has the right to trap on the preserve such game animals or game birds as in their judgment shall seem advisable. It was made a part of the agreement that the Rossiter Realty Company should at its own expense surround the refuge by at least one wire on the boundary thereof. Charles C. Worthington, who originally established the preserve for his private use, says that the preserve contains more deer running at large than any other tract of the same acreage in the country, and nowhere in the United States can wild deer be seen as invariably and in such numbers by the casual visitors.

It is believed that by the protection afforded in this extensive refuge all sorts of game inhabiting the land will multiply rapidly and spread to the surrounding country. The Board took adequate measures to protect the refuge during the deer season, and the general open season. The Board posted the land and had circulars printed showing the act of the Legislature giving it authority to acquire land for game refuges. The idea of a game refuge is not regarded any longer as an experiment by expert conservationists, and in taking over this land by lease the State has followed in the steps of the Federal authorities, who maintain extensive refuges in several parts of the United States.

**Receipts, Fines, etc.**—The amount received by the State Treasurer during the year on account of the Hunters' and Anglers' License Act of April 9, 1914, was \$101,947.05.

By reason of the repeal of the Resident License law, a balance remaining in that account, \$1,096.74, was transferred in October to the Hunters' and Anglers' License Fund.

The aggregate of fines collected for violations of the fish and game laws amounted for the year to \$6,330.11.

For licenses to steamers and sailing vessels to take menhaden with purse nets within the three-mile limit of our coast there was received \$5,325, as compared with \$6,300 for last year. The decrease can be accounted for on account of the scarcity of menhaden. At the date of this report there are 22 steamers and 22 sailing vessels holding licenses to take menhaden. The fees for steamers range from \$100 to \$200, according to tonnage, while the flat rate for sailing vessels is \$25. The licenses are for the calendar year.

On account of licenses for the operation of fish pounds in the Atlantic Ocean and Sandy Hook Bay the receipts during the fiscal year were \$5,510. For the calendar year for which licenses were issued there were 143 licenses granted, 102 for the Atlantic Ocean, and 41 for the above mentioned Bay.

Following is a summary of the reports of pound fisheries for the year ending December 31, 1915:

Approximate value of all pounds.....	\$471,217.34
Proceeds derived from sale of fish.....	617,326.88
Number of pounds of fish caught and disposed of....	26,394,479
Licenses issued—	
Atlantic Ocean .....	102
Sandy Hook and Raritan Bays.....	45
	147
Number of pounds operated.....	146
Number of men employed.....	795

For the period between the close of the quail season in 1915 and March 31, 1916, 1,483 permits were issued to hunt foxes.

Under the law which allows a citizen above the age of 10 years and below the age of 14 years to hunt when provided with a special license, and accompanied by a holder of a regular license above the age of 21 years, 29 licenses were issued from November 1, 1915, to October 31, 1916.

**Prosecutions.**—During the year ending October 31st there were 392 prosecutions; 369 of the defendants were convicted; 14 were acquitted, 6 cases were abandoned, either on advice of the Attorney General as to the law, or for lack of evidence in possession of the person making the complaint to the Warden; 3 cases are still pending; 20 cases were appealed to the Common Pleas Court. In default of payment, 17 of the defendants were committed to the county jail for periods of 10 to 90 days. In 12 cases, by reason of age or circumstances, sentence was suspended on payment of costs. The licenses of four hunters were revoked, and 34 guns were confiscated from aliens, each of whom was not the owner of real estate to the value of \$2,000.

The number of prosecutions during the past year was 43 less than last year, when 435 persons were arrested. As the wardens have been active, we can only attribute this falling off to the fact that the laws were better observed.

**Publicity.**—The Board has resumed publication of a "News Letter," which is sent approximately each month to the newspapers of the State and to the newspapers of New York and Pennsylvania which circulate largely in New Jersey. This publicity work has been found to be of great value in creating a better understanding of our laws and work, not only by hunters and fishermen, but by all classes. To indicate the character of the matter in the news letters there follow some topics of articles which have been printed:

"Wood Ducks Plentiful But Still Protected."  
 "Fortunes In Furs on New Jersey Lowlands."  
 "Old Time Coon Hunts Again Popular Sport."  
 "Defend Red Drum Fish as Jersey Coast Asset."  
 "Laws Save Pheasants Once Thought Extinct."  
 "Health Authorities Join War on Cats."  
 "Shad from West May Revive Eastern Runs."  
 "Hunt Vagrant Cat as Wolf, Says Scientist."  
 "Disarming of Aliens Saves Birds and Game."  
 "Lobster Fisheries on Jersey Coast Increase."  
 "Federal Law Restores the Crop-Saving Birds"  
 "New Jersey Gets a Great Game Preserve."

The newspapers within and without the State have eagerly seized upon these articles and have given them places of prominence in their columns.

The public were further acquainted with the work of the Board by the distribution of 15,000 fish and game law books, 15,000 charts on paper known as emergency charts showing the seasons, 40,000 small English charts on cardboard, 2,000 large English charts on cardboard, 2,000 small Hungarian charts and 2,000 small Italian charts on cardboard. There were also printed 1,500 copies of the Annual Report of the Board, the hunting and fishing licenses and various forms for office use.

**Distribution of Fish.**—Protector James M. Stratton reports a total of various species of fish planted in the lakes and streams of the State during the fiscal year ending October 31, 1916, as 39,022,587. The source of supply is shown in the following tabulation:

TOTAL FROM HATCHERY—	
Rainbow Trout .....	218,395
Brook Trout .....	261,205
Land-locked Salmon .....	11,800
Brook Trout Fry.....	12,000
Perch .....	38,250,000
Chinook Salmon .....	132,900
Black Bass .....	5,000
	<hr/> 38,891,300
TOTAL FROM U. S. BUREAU OF FISHERIES—	
Brook Trout .....	200
Perch .....	400
Black Bass .....	800
Crappie .....	800
	<hr/> 2,200

TOTAL FROM ORANGE, BOONTON, OAK RIDGE AND CLINTON RESERVOIRS, DELAWARE AND RARITAN CANAL, AND OTHER PRIVATE WATERS—

Baitfish .....	38,469	
Black Bass Fry.....	18,000	
Rock Bass .....	831	
Perch .....	50,988	
Black Bass .....	9,735	
Crappie .....	1,000	
Pickereel .....	8,564	
Catfish .....	1,500	
		129,087
		39,022,587

On January 3rd we commenced netting a portion of the Delaware and Raritan Canal for black bass and other fish for stocking purposes. The bass taken in January were from six inches in length to four pounds in weight, and the pickereel, perch and crappie also averaged a good size. All the fish taken from the canal were planted in lakes in the counties in the middle and southern sections of the State.

The Board also secured a large supply of good-sized fish in netting the Orange, Boonton, Oak Ridge, Clinton Reservoirs and other private waters.

The Princeton Fish and Game Association, under a permit issued by the Board, during the suspension of navigation in the Delaware and Raritan Canal, at their own expense, caught 704 black bass, which were placed in Carnegie Lake at Princeton.

**Hatchery.**—Three bass ponds were completed at the Hatchery, at a cost of \$3,069, by J. W. Heller of South Orange, who was the lowest bidder for the work. The raising of black bass in captivity is a difficult matter, but the Board believes that we can make a success of it, and if this is done a notable step forward will be taken in the stocking of our waters. The demand for bass raised in the private hatcheries greatly exceeds the supply, and it is practically impossible to purchase bass of a suitable size for stocking. For many years our supply of bass came principally from the Delaware and Raritan Canal, and for the past three years we have secured a number from various reservoirs in the State.

During the spring and summer we had in our employ a person experienced in the taking of fish eggs and small bass from lakes and streams, which were removed to the Hatchery to be raised to a suitable size for stocking.

Superintendent Charles O. Hayford, of the Hatchery, in his fourth annual report says:

"The practical propagation of food and game fishes by artificial means is now conceded to be not only a success, but one of the greatest triumphs of modern science. When I say modern I do not forget that fish culture is an old science; it goes back to an early date in the history of China, and its origin is lost in antiquity. In 1763 Stephen L. Jacobi, a Prussian soldier, devised a process of stripping the female fish of her spawn and then mixing it with the milt of the male. This simple method is still in use at all fish hatching establishments. About fifty years after Jacobi's work, Joseph Remy, a fisherman of the Vosges Mountains, made a discovery upon which the entire business of economic fish culture or to-day practically rests. This discovery was that impregnation of fish eggs takes place after they have left the body of the animal, and can therefore be performed as well by artificial means as in the natural way by the fish themselves, with the exception of the bass family.

"About forty years after Remy's discovery the first government fish culture station was established at Huningen, in Alsac, Hungary, and during the following year one was established on the river Tay in Great Britain. In 1865, Dr. Theodore Garlic, of New Hampshire, imported salmon eggs from Canada and hatched them in a trout pond at Cold Springs, N. H. The interest in fish culture rapidly advanced, and in 1871 our government established a national fish commission.

"The work since that time has been taken up by most of the states, a great many clubs, and private companies. It should not be denied that a great many phases of the work are still in an experimental stage, as the various kinds of fish require different methods of handling and hatching of eggs. The essential fact is positive, i. e., that artificial propagation of fish is necessary if the future generations are to receive a cheap and healthy food, and the angler is to continue to exist.

"Although New Jersey was one of the last to take up this work, it now has one of the largest, most modern and best equipped plants in the United States.

"On November 13, 1915, we received 500,000 Royal Chinook salmon eggs from the Fish and Game Commission of the State of Oregon. These eggs were hatched with very good success and grew to seven and eight inches in nine months. We have the same number of Chinook salmon eggs bought for next year.

"From our brown trout brood fish we stripped 200,000 eggs. These were hatched successfully and are now three and four inches long. As we could not buy brown trout eggs, it was necessary for us to raise our own breeders. I believe it best to follow the course of New York, Michigan, Wisconsin and Pennsylvania in stocking

suitable streams with brown trout, as he is a game fighter and reaches a weight of eight to fifteen pounds and rises readily to fly in a great many sections. I do not advise stocking natural brook trout streams with brown trout.

"In April we collected 34,000,000 yellow perch eggs from lakes in the northern section of the State, and hatched them in our new batteries, besides hatching 10,000,000 received from the U. S. Bureau of Fisheries.

"On June 10th to 18th, I visited six of the hatcheries of Michigan and Wisconsin to learn and discuss their methods of fish culture. The bass hatchery at Comstock Park, Michigan, in charge of Dwight Lydell, Assistant Superintendent of Michigan Commission, I found very instructive and gathered much valuable information. Mr. Lydell is the most successful bass culturist in the United States, and kindly gave me his entire time for three days showing and explaining his methods. Mr. Seymour Bower, Superintendent of the Michigan Commission, has visited our Hatchery, and he says he can see no reason why we should not be able to raise small mouthed bass, as our conditions are similar to theirs.

"In June we collected 15,000 small mouthed black bass fry, ½ inch long, 1 week old, from lakes in the northern section of the State and transferred them to a small lake at the Hatchery for rearing. The result was beyond all expectations. September 15th and 16th we collected 5,620 as fine bass as could be desired, three to four inches long. We now have five ponds completed and available for bass work. Next year we hope to place from 30,000 to 50,000 bass fry in ponds as ponds can be made to produce feed for that amount. The small mouthed bass is one of the most highly prized fish which inhabits our inland waters and one of the species the anglers seek most during the summer months.

"I would recommend that the Department build bass ponds as fast as funds are available in order that it may stock liberally ponds and lakes in the northern section of the State with small mouthed bass and southern sections of the State with large mouthed bass and pickerel.

"We gave an aquarium exhibit at the Inter-State Fair, at Trenton, for the first time this year, of the following food and game fishes of the State: brook trout, rainbow trout, land-locked salmon, chinook salmon, small and large mouthed black bass, pickerel, perch, sun fish, rock bass and catfish. The exhibit, consisting of nine tanks, attracted a great deal of attention and was very educational. A great many persons were not aware of the fact that the State had a Fish Hatchery.

"The improvements completed and purchased during the year are as follows: Built three large bass ponds, 170 feet long, 70 feet

wide, 1 to 6 feet deep; graded 3,000 lineal feet of roadbed, 7½ feet wide, filled in same with eight inches of broken slate, rolled the slate down to four inches in thickness, and it is now ready for fine screenings of crushed stone; graded 800 lineal feet of walks, four feet wide, filled same with six inches of broken slate, rolled slate to three inches, and it is ready for fine screenings of crushed stone; filled and graded 1,800 lineal feet of bank, 12 feet wide; set out 1,287 lineal feet of same with shrubbery; filled and graded lower side of entrance road, 970 feet long, 50 feet wide, set out same with shrubbery; excavated trench 1,030 lineal feet long, 5½ feet wide, 2 feet deep, filled same with stone for foundation for retaining wall and concrete water course; built on above foundation 970 lineal feet of retaining wall, 2½ feet high, 18 to 12 inches thick; laid 3,100 square feet of concrete water course, 5 inches thick; unloaded and carted one carload of manure from station; carted and spread 300 bushels burnt lime on corn field; built addition to barn 26 feet by 30 feet; purchased one large gray horse six years old, weight 1,300 pounds; purchased new Ford car for general use around Hatchery and in collecting eggs and fish from lakes in the State.

"Bought one roller, one scraper, and one harrow; planted seven acres of corn, harvested 625 bushels; harvested 10 tons of hay; harvested 200 tons of ice; strung wire from Hatchery to lodge house to furnish lights at house and gates; built 1,093 feet of Knox fence seven feet high, three strands of barb wire on top; installed pump in storage building for pumping water into tanks when distributing fish; laid 200 feet of two-inch pipe to and from same; installed five light lamp posts on loading platform for light when loading fish or working around Hatchery at night; built 200 jar battery for hatching perch; built 1,506 feet Knox fence five feet high on both sides of entrance road, painted posts and braces with two coats of paint; graded and filled in around Hatchery building and ponds; put leaders and gutters on Assistant Superintendent's house; painted 100 hatching troughs in hatching buildings and nursery.

"The following are under construction or about to be constructed: top finish of 3,000 feet of road, 7½ feet wide; top finish of 800 feet of walks, four feet wide; 1,000 feet of walk, four feet wide, to be graded and built; 1,400 feet of road, average 8½ feet wide, to be graded and built; one large bass pond, 250 feet long, 150 feet wide, partially excavated and under construction: 400 feet of trench, 400 feet of 2-inch pipe laid in same to carry water from spring near Bell's line to new bass pond; trench four feet deep, 150 feet long for 150 feet of 12-inch drain pipe.

"The following varieties of fish were raised and planted:

	Raised from Nov. 1, 1915, to Oct. 31, 1916	Estimated No. on hand Nov. 1, 1916
Fingerling rainbow trout, 2 to 7 in. long.....	474,000	400,000
Yearling rainbow trout, 6 to 8 in. long.....	278,935	124,500
Two-year-old rainbow trout, 9 to 12 in. long....	28,000	10,000
Fingerling brook trout, 3 to 6 in. long.....	334,990	25,000
Yearling brook trout, 7 to 10 in. long.....	16,886	1,200
Two-year-old brook trout, 10 to 12 in. long....	3,599	500
Fingerling brown trout, 3 to 4 in. long.....	100,000	100,000
Yearling brown trout, 6 to 8 in. long.....	1,500	1,500
Three-year-old brown trout, 14 to 18 in. long..	1,450	1,250
Three-year-old steelhead trout, 14 to 18 in. long.....	1,000	800
Fingerling chinook salmon, 5 to 9 in. long.....	152,010	3,000
Fingerling landlocked salmon, 1 to 2 in. long..	10,000	.....
Yearling landlocked salmon, 3 to 5 in. long....	15,853	.....
Small-mouthed black bass, 3 to 4 in. long.....	5,620	500
Yellow perch fry.....	41,000,000	.....
Totals .....	42,423,843	668,250

**Game Stocking, Deer Killed, etc.**—The Board directed Protector Stratton to ascertain the approximate number of Hungarian partridges in the State, and the reports received indicate that there were last January about 490 birds, 430 of which were in four counties, namely, Salem, Somerset, Hunterdon and Gloucester. Our last distribution of this bird was in 1912. In other parts of the State where partridges had been liberated they were seen for the first and second years, but have now practically disappeared. We never had any reports of many of the partridges being killed. In this connection, however, it is interesting to know that the English Setter Club, of Medford, N. J., generally liberate about 100 of these birds each year for their field trials, and claim that the bird is fairly becoming established in the vicinity. The counties in which birds were reported are the following:

County	Coveys	Birds
Atlantic .....	1	12
Burlington .....	3	20
Cumberland .....	2	10
Hunterdon .....	5	50
Passaic .....	1	10
Salem .....	10	150
Somerset .....	16	175
Union .....	1	8
Gloucester .....	6	55
Totals .....	45	490

The State of Connecticut about five years ago liberated a number of Hungarian partridges, and some were put on the farms of two gentlemen whom Thorfin Tait, of Metuchen, N. J., met while on a visit to that State. Mr. Tait said the gentlemen informed him that they did not see a covey until this year, and that now on each farm there are several flocks, one containing 40 and the other about 15 birds.

During April and September a distribution of 5,903 English ring-neck pheasants was made. The Board was able to secure from the western United States a number of fine quail and 1,019 were liberated in good condition. We also secured a small sample lot of Mexican quail, which did not prove satisfactory.

Superintendent Duncan Dunn at the Farm continued his experiment of raising quail in captivity, and reports that with 35 breeders he raised 200.

Arrangements have been made for the purchase of a number of Western rabbits. Heretofore the problem of shipped rabbits arriving alive has prevented purchases, but the dealer with whom we have taken up the matter assures us that his manner of shipment will be satisfactory.

On the last three Wednesdays in October and the first Wednesday in November, 1915, when the hunting of deer was legal in this State, there were 503 deer and one elk killed, 290 does and 213 bucks. Of this number 481 were gathered by the hunters on the day of hunting, and 22 were found dead in the woods by persons at various times between the legal days and after the season had closed.

On the four days in which deer hunting was permitted, two persons were killed and four injured. It is possible that many more deer were killed than are included in this summary, but this is as near correct as the wardens of the counties could ascertain.

The following table shows the counties in which deer were killed, gives the number of does and bucks, number found dead and number of persons killed and injured:

County	Does	Bucks	Found Bucks	Dead Does	Elk	Persons Killed	Persons Injured
Atlantic .....	56	45	3	4	.....	1	2
Bergen .....	16	7	.....	1	.....	.....	.....
Burlington .....	31	28	.....	.....	.....	.....	1
Cape May .....	8	9	.....	.....	.....	.....	1
Cumberland .....	55	35	2	3	.....	.....	.....
Mercer .....	3	3	.....	1	.....	.....	.....
Morris .....	4	4	.....	3	.....	.....	.....
Ocean .....	45	31	3	2	.....	.....	.....

Passaic .....	4	5	---	---	---	---	---
Salem .....	4	8	---	---	---	---	---
Sussex .....	4	4	---	---	---	1	---
Warren .....	46	26	---	---	---	---	---
Total .....	276	205	8	14	1	2	4

We obtained a few rabbits and squirrel by trapping them on the South Mountain Reservation of the Essex County Park Commission, and we bought 48 rabbits in the West, but only 40 survived the journey.

The Board sent out a circular letter to each warden to make inquiries in his county as to the practicability of securing farmers to plant cowpeas, buckwheat, kaffir corn or other suitable peas for grain and to let the same stand as food for birds. From several favorable replies received it was thought at first that a fine work could be conducted along this line. The State bought the seed and in some few cases paid for the plowing and planting, at a total cost of \$255.43. It appears that the benefits received do not justify a repetition of the expense.

**State Game Farm.**—In order to straighten lines at the Game Farm the Board acquired three pieces of land from three persons at a cost of \$980, and condemnation proceedings have been begun to obtain an adjoining tract of 10 acres.

It was found necessary to restrict admission of visitors at the Game Farm during the breeding season, and to that end regulation was made to have the Game Farm open to the public on week days from 10 A. M. to 4 P. M. and Sundays from 1 P. M. to 5 P. M. from August first to April first, with admission only by card and under restrictions to be decided by the Board.

Duncan Dunn, Superintendent of the State Game Farm, Forked River, in his fourth annual report says:

"We fenced in ten acres of woods with a six foot fence for a pheasant pen, built one thousand feet of Knox fence along the road leading to the bay; fixed three rooms over the carpenter shop for sleeping quarters for the men; painted and papered inside of small cottage on farm; laid 225 feet of gas pipe, put a gaslight in engine house to have light to start the engine in case of fire; also erected a gas lamp to give light around buildings; laid 100 feet of water pipe in pheasant pens, and 300 feet of board runs to carry water through bird pens; rebuilt 150 crates for shipping out pheasants; rebuilt 40 deer crates for shipping out deer; moved the deer fence across the bottom of field down at the meadows, so

that the deer can get on both sides of woods; rebuilt 8 pens for the fancy birds.

"Plowed up ground and sowed 18 acres of oats, 5 acres of millet, 5 acres of buckwheat, and 4 acres of rape; plowed up all the bird pens, limed them, and seeded them down in grass, also limed a 10 acre field. Planted 800 privet hedge, 50 shrubs, and 12 maple trees at the Superintendent's house. Transplanted shrubs and trees at Gate Lodge. Scraped and sprayed all the apple trees in orchard.

"Fixed up the road leading down to duck pond and carted two carloads of gravel from the depot and put it on the road. Carted 40 loads of gravel from Murray Grove for walks and roads, a distance of 5½ miles round trip. Hauled 5 carloads of manure from the depot and spread it on the fields, and hauled one carload of coal from the depot, a distance of three miles round trip. Cut and hauled 20 loads of cedar brush for the breeding pens. Harvested 25 tons of hay, 10 tons of oats, and 50 loads of ice; cleaned out the chicken houses twice a month and sprayed them well with a disinfectant; dipped 550 rearing coops, 550 bottom boards, 150 frames and 200 feed boards in a disinfectant, and then carted them out to rearing field. Sprayed the hatching house well, and then cut 600 sods and put them in the boxes for nests; hauled out 30 loads of logs from woods and cut and sawed the same.

"Mated off my breeding pheasants, which were 500 stock birds, and clipped their wings. During the months of April and September we made a distribution of pheasants; also shipped out 58 wild turkeys and 30 deer. Hatched out 6,700 pheasants and put 5,000 in pens; a lot got away that we could not catch up. Kept 35 pair of quail for breeders and raised 200. We had three wild turkeys for stock and raised 30, also raised a number of golden and silver pheasants, and mallard ducks. The vermin have been quite bad this year. The rats and crows were especially troublesome. We killed 50 cats, 14 weasels, 11 opossums, 6 coons, 200 rats, 150 crows and other vermin."

**Organization.**—The Board organized on December 14th with the re-election of Commissioner Napier as President, and Commissioner Logue as Treasurer. Commissioner Faunce entered into a new term of four years, dating from November 25th. Commissioner Shanley was designated to act as President in the absence of the President at any time during the year.

The Board met every month. Our members frequently came to the Capitol in connection with work of the Board, and in consideration of bills before the Legislature.

**Codification.**—Joint Resolution No. 8, approved March

21st, 1916, provided for a commission to codify the fish and game laws. Protector James M. Stratton was appointed to represent this Board on the Commission, and William C. French, of Camden, was appointed by the Governor to the Commission. The other members of the Commission were: Representing the Assembly, Hon. Raymond Sheppard, of Haleyville, Cumberland County, and Hon. Harry W. Mutchler, of Rockaway, Morris County; representing the Senate, Hon. Thomas A. Mathis, of Toms River, and Hon. John A. Ackley, of Vineland, Cumberland County. The Commission had a meeting, but up to date the Board is not advised as to any recommendations it has made in reference to the laws. The Commission organized with Senator Mathis, President; Assemblyman Sheppard, Secretary, and Mr. William C. French as legal adviser.

**Trucks, Ford Cars.**—During the year the Board purchased three Garford trucks, a Garford truck which was in the service of the Commission having been taken in exchange as part payment for two new trucks. The last two trucks purchased were 1½ ton trucks, it being considered that a greater service could be secured by trucks of this weight than those of two tons. This makes a total of three trucks in use. These trucks are indispensable in the distribution of fish and birds. In former years the Board received many complaints of fish and birds arriving in bad condition when they were shipped by express.

The Board purchased four additional Ford cars, one being for the use of Assistant Protector Harry E. Cudney, one for the Hatchery, and one each for Warden William Henry Small, of Englewood, Bergen County, and Warden Jacob D. Roe, of Newton, Sussex County. These purchases were made because the reduction in the price of cars made these cars practically as cheap as motorcycles. It has been found that a small automobile can reach places inaccessible to a motorcycle, and besides its use in the work of the Board is greater. At the present writing there are six Ford cars in use. The cars not mentioned above are in charge of Assistant Protector Howard Mathis and at the State Game Farm.

**Wardens.**—In December the services of Edward R. Davis as Warden for Salem County were dispensed with, and on September 12th David A. Thompson, Jr., of Salem, was appointed Warden on probation to fill the vacancy, Mr. Thompson having been certified to the Board as an eligible by the Civil Service Commission.

Garret P. Thorne, of Holmdel, P. O. Matawan, R. F. D.,

following his certification to this Board as an eligible for appointment as Warden, was so appointed and commenced his duties January 15th.

John F. Cox and John B. Bailey, of Washington, were appointed in October as temporary Wardens for the protection of the Buckwood Park Preserve, which was leased by the State, and a reference to which is made in another part of this report.

Several of our Wardens who have been designated as Federal Wardens for the bringing of prosecutions under the U. S. Migratory Game Law gave assistance in investigations on land and water to Philip S. Farnum, District Inspector.

During the winter's heavy snows the Wardens were successful in locating quail and pheasants, and putting out feed for them.

**New Jersey and Adelaide.**—The principal work of patrolling the waters of the State was done by the Board's launches "New Jersey" and "Adelaide." The "New Jersey" covered the Atlantic Ocean, Sandy Hook Bay, Raritan Bay, Delaware River and Bay, and the supervision of the pound net and menhaden fishing industry, and for the enforcement of laws pertaining to these waters. The "Adelaide" did service in Barnegat Bay, Great Bay, Metedeconk River, Mullica River, Great Egg Harbor River, and other waters, looking after illegal shooting, duck shooting at night, shooting ducks from power boats, etc.

**Deputy Wardens.**—A circular letter was sent to all deputy wardens in February to the effect that thereafter they should not commence any fish and game prosecution in the matter of drawing a complaint until they had consulted with the nearest regular paid Warden. In cases where it was necessary to make a summary arrest the deputy was informed that he could make the same and also the complaint, but he must immediately notify the Warden for the purpose of having the Warden examine and approve the form of the complaint. This action was necessary because so many persons who were deputies drew complaints which did not stand the test of the courts, entailing considerable annoyance and expense on the Board.

The Prosecutor of Hudson County succeeded in having former Deputy Warden Edward Rayner extradited from New York State on an indictment for making arrests for violation of the fish and game laws after his removal from office, and retaining moneys received for fines imposed for such violations. He pleaded guilty to all the charges before Judge

Sullivan, and was committed to the Hudson County Penitentiary for a period of eighteen months.

**Drum Fish.**—Complaints had been made that drum fish were destroying oysters in Tuckerton and Great bays, the complaint having been laid before the Board by George A. Mott, Director of the Bureau of Shell Fisheries; and upon his request permission was granted to dynamite the fish, with the understanding that the work was to be done in the presence of an officer of this Commission, and that if in the Board's judgment any large quantity of food fish was destroyed the permission should be revoked. Later, Mr. Mott informed us that because of the carelessness of the oyster planters in not procuring the necessary equipment in time the drum fish destroyed large quantities of oysters and some clams and got away before the oystermen were ready to dynamite them.

**Pollutions.**—The State Board of Health has admirably co-operated with this Department in the matter of complaints respecting pollutions of our waters. Blank forms of complaints of pollutions were prepared by the Board of Health and distributed to our wardens, which they fill out in a preliminary investigation of reported pollutions.

**Starlings.**—There was an increasing number of complaints regarding destruction caused by starling colonies, and 19 permits were issued, in accordance with law, to municipalities to destroy starlings. It might be stated that starlings are protected as insectivorous birds and they may only be destroyed on a permit from this Board, following an application from the governing authorities of a municipality to the effect that they have become a nuisance in the municipality. It is claimed that this bird, which is rapidly increasing, drives away our native birds.

**Conference on Shad.**—In January W. W. Welsh, of the U. S. Bureau of Fisheries, attended a conference of the Board with a delegation of Burlington County fishermen. As is well known, there had been a startling falling off in the number of shad caught in the Delaware, and the Burlington delegation presented the following recommendations:

To close the shad season May 31st.

To close season for suckers April 10th.

To close season for carp April 10th.

That the season for catfish and eels with fyke nets should begin August 1st and close April 10th.

That the season for taking catfish with seines should be from September 1st to April 10th.

That the meshes for gill nets for taking shad should be not smaller than  $5\frac{3}{4}$  inches.

That the meshes of hauling seines should be not smaller than 3 inches.

That the meshes for taking suckers should be not smaller than 3 inches.

The minutes of the Board say:

"It was the opinion that the Delaware River laws could only be changed through joint action with Pennsylvania, the Legislature of which State does not meet until next year (1917).

"The Board took under advisement the matter of making changes in the law."

Mr. Welsh said that the U. S. Bureau of Fisheries would include the Delaware river in an investigation of the shad industry from Florida to Maine. He reported that the supply of pelagic food fishes is very irregular, and that fluctuations of this character are well illustrated by the Scandinavian herring fisheries, of which more or less authentic records have been preserved for more than 500 years. It has been found by modern methods of research that in several consecutive years of successful herring fisheries, the majority of the catch represents the hatch of a single year, when conditions were favorable for the survival of a relatively large percentage of the eggs laid. This has been proved by determining the age of the individuals in large samples of each year's catch.

Mr. Welsh believed that the pollutions of the Delaware river interfered little with the up-river movement of the adult shad, but that the pollutions, especially oil on the surface, worked great harm to the fry and young during their first summer, by destroying vegetation amongst which the natural food originates, and by discouraging or preventing the natural method of feeding on insects at the surface.

It appeared certain that pollution had practically destroyed great areas of spawning grounds immediately below Philadelphia. Mr. Welsh added that he had no recommendation to make at this time, except that it would be advisable to change the shad season in any way that would allow a greater number of adult fish to reach suitable spawning grounds.

A delegation of shad fishermen from Burlington County came before the Board and expressed a wish to save and fertilize shad eggs if arrangements could be made to transport the eggs to the Pennsylvania hatchery at Torresdale, with a

view to stocking the Delaware river. Commissioner N. R. Buller, of Pennsylvania, co-operated with us in such a work in May. The launch "New Jersey" delivered pails to the fishermen between Beverly and Tullytown, and arrangements were made to receive them at any time, day or night, and transport them to the hatchery. A similar collection of eggs was made on the Cohansey river. We succeeded in collecting about 3,000,000 eggs, but Superintendent J. R. Berkhouse, of the hatchery, informed us that by reason of the low temperature of the water they could not be transported to the headwaters of the Delaware river, which we desired to do, and it was necessary to plant the eggs in the Delaware river at the mouth of Rancocas creek at Riverside.

**The State Shad Industry.**—Protector James M. Stratton makes the following interesting report on the shad industry of the State:

In view of the continual decrease in the catch of shad in the Delaware River and Bay, I have prepared statistics showing the number of nets and boats used, number of men engaged, number of shad caught, amount realized from the sale of shad, and the value of the boats and nets used, during the past season, together with a comparison of the same during the year 1913, which was the date of my last census on this subject.

The data for this report was obtained through the wardens of the counties in which the fishing was done, from the captains of the vessels engaged in carrying the shad to the wholesale market in Philadelphia, and from personal interviews with fishermen. The report is probably as accurate as is possible to obtain, and includes the counties of Cumberland, Salem, Gloucester, Burlington and Mercer. It seemed to be impracticable to obtain a complete and definite report from Camden county, as there was only about one-third of the number of men engaged in the business as in 1913, many of whom only went out two or three times, caught no fish, and put their nets away for the season. Some fishermen purchased new nets which were not put in the water the past season; and the few fish caught in that county were sold on the streets in the city of Camden or Gloucester by the netters.

I have not included Hunterdon, Warren and Sussex counties, where in former years there was considerable shad fishing. It was a matter of common knowledge in these localities during the past season that the catch was practically nothing, and less than in former years, which goes to emphasize the fact of the general decrease in shad.

Many persons who were formerly engaged in shad fishing are

now steadily employed, at good wages in Du Pont's and other munition plants along the Delaware River. This, in addition to the gradual falling off in the catch for the past two or three years, is a reason for the decrease in the number of men engaged during the past year.

This census shows a decrease in the number of nets in operation and number of persons engaged in the business. It will also be noted that notwithstanding the fact that the price of shad has advanced 100% during the past three years, the catch of shad has decreased more than one-half million fish. In 1913 the average price of shad was 35c. to 40c. each. During the past year the fishermen received from 60c. to 80c. each, and in many cases good roe shad could be readily sold in many places from \$1 to \$1.75. The amount realized from the sale of the fish is nearly \$150,000 less than the year 1913.

Many theories are advanced as to the cause of this decrease, and various remedies are suggested as to the best method of increasing the supply. The fishermen who are engaged in the business in Delaware Bay and the lower portion of the Delaware River generally attribute the decrease to the lack of propagation of shad and to the refuse from the Du Pont Powder Works at Pennsville, and Gibbstown, and other factories along the river. The fishermen in Camden, Burlington, Mercer and Hunterdon counties attribute the scarcity of shad in those counties to the long nets which are used in Delaware Bay and in the mouth of the Delaware River, and advocate the use of shorter nets. The length of nets used in the lower part of the river and bay is 600 to 800 fathoms, while in the upper part of the river 100 to 150 fathoms is the maximum limit.

Above Trenton Falls gill nets are prohibited, and fishing is confined to hauling seines.

Some fishermen advocate a license to fish for shad or a closed period for a term of years.

COUNTY	1916 Boats and Nets	Decrease in No. Boats and Nets Since 1913	Increase in No. Boats and Nets Since 1913	1916 Men Employed	Decrease in Men Since 1913	Increase in Men Since 1913	1916 Shad Caught	Decrease in Shad Caught Since 1913	1916 Value of Fish Caught	Decrease in Value of Fish Caught Since 1913	1916 Value of Boats and Nets
Cumberland	87	26	...	174	52	...	63,000	\$133,000	\$34,650	\$41,790	\$52,200
Salem	126	12	...	252	24	...	103,200	206,569	67,080	53,729	75,600
Gloucester	67	...	16	134	...	22	46,000	35,000	27,600	750	18,000
Burlington	72	15	...	143	60	...	11,867	90,983	8,781	27,215	8,590
Mercer	21	23	...	47	41	...	3,400	44,400	3,160	15,960	3,300
Totals	373	76	16	750	177	22	227,467	\$509,952	\$141,271	\$139,444	\$157,690

DELAWARE RIVER AND BAY SHAD FISHING STATISTICS.

RECAPITULATION

	Boats and Nets	Men Engaged	Shad Caught	Value of Fish Caught	Value Boats and Nets
1913	433	905	737,419	\$280,717.41	\$161,350.00
1916	373	750	227,467	141,271.00	157,690.00
Decrease since 1913	60	155	509,952	\$139,446.41	\$ 3,660.00

Miscellaneous.—On December 1st the Secretary and Protector appeared before the Assembly Committee investigating the fish pound industries and gave the Committee the information they desired from them.

The Committee of 1915 to investigate pounds was continued for 1916, the membership being as follows: Edward Schoen, Newark, Chairman; Hon. Alonzo D. Herrick, Hackettstown; Hon. Wm. N. Runyon, Plainfield; Hon. Bertram E. Whitman, Pleasantville; Hon. Harry E. Johnson, Newark.

W. A. Roberts and Arthur Orr, representing the U. S. Bureau of Fisheries, inspected the Board's records of pound fisheries in connection with their statistical canvass of the fisheries of New Jersey and New York.

President Napier and Protector Stratton, on invitation of Commissioner Pratt, of the New York Conservation Commission, attended a conference at Washington, D. C., with U. S. Commissioner H. M. Smith, on the subject of marine fisheries.

The Legislature visited the State Fish Hatchery February third, and the State Game Farm February tenth, together with other State officials. Many of the members, who did not have previous information as to the work being done by the Board, expressed surprise at the magnitude and completeness of both plants.

## NEW JERSEY LEGISLATION IN 1916.

CHAPTER 30. Fixes a season for coots, commonly called crow ducks, from October first to March fifteenth.

CHAPTER 93. Prohibits the destruction of nets or the taking of fish from nets without the consent of the owner.

CHAPTER 130. Makes it unlawful for any person to go in the woods or fields at any time with a gun or firearm when intoxicated or under the influence of any drugs or intoxicating liquors.

CHAPTER 138. Authorizes the Board of Fish and Game Commissioners to acquire by condemnation or otherwise land in this State to be used for the propagation of fish and game. Applies to the straightening of lines at the Game Farm.

CHAPTER 194. Prohibits the use of nets in the waters of Peck's Bay, Garret thoroughfare, Beach thoroughfare, Dry thoroughfare, Finger channel, Rainbow channel, Great Egg Harbor Bay or Great Egg Harbor inlet, in the county of Cape May, between the first day of June and the first day of September in any year.

CHAPTER 245. Prohibits vessels over 40 tons from using purse nets in Sandy Hook and Raritan Bay.

CHAPTER 286. Authorizes the Fish and Game Commission to lease land for game refuges, but act applies only to Warren and Sussex counties.

CHAPTER 265. Amends the act of 1915 by permitting the use of nets in Sandy Hook Bay.

JOINT RESOLUTION No. 3, provides for a codification of the game laws.

CHAPTER 262. Prohibits the killing of does and fawns. No change in season.

JOINT RESOLUTION No. 5, provides for continuation of investigation of fisheries industry.

## SUPPLEMENT TO 1914-1915 REPORT.

## To Conform with Requisition System.

## INCOME.

Balance, as per statement in last printed report, Oct. 31, 1915....	\$34,038.75
Less Lapse—	
Act of 1908.....	\$1,146.41
Fines Account .....	1,197.30
Appropriation, Annual .....	21.83
Appropriation, Special Supplemental.....	24.05
	2,389.59
	\$31,649.16

## EXPENDITURES.

Paid after Nov. 1, 1915, on requisitions for 1914-1915—	
Resident License Fund.....	\$ 473.53
Game Protection Fund.....	3.50
Hunters' and Anglers' License Fund.....	3,303.04
Act of 1908.....	1,185.05
Fines Account .....	869.45
Appropriation, Annual .....	206.57
	6,041.14
To Balance .....	25,608.02
	\$31,649.16

## FISH AND GAME COMMISSION.

## FINANCIAL STATEMENT.

## INCOME.

Balances November 1, 1915—		
Resident License Fund.....	\$	921.99
Game Protection Fund.....		5.09
Hunters' and Anglers' License Fund.....		24,680.94
		\$ 25,608.02
Receipts—		
Resident License Fund.....	\$	174.75
Hunters' and Anglers' License Fund.....		101,947.05
Act of 1908 Account—		
Menhaden Licenses .....	\$5,325.00	
Pound Licenses .....	5,510.00	
Breeders' Licenses .....	330.00	
Sundries .....	474.15	
Sales .....	985.29	
		12,624.44
Fines Account .....		6,330.11
		121,076.35
		\$146,684.37

## EXPENDITURES.

Hunters' and Anglers' License Fund.....	\$	98,621.17
Act of 1908.....		11,727.95
Fines Account .....		5,069.89
Game Protection Fund.....		5.09
		\$115,424.10
To Balance .....		*31,260.27
		\$146,684.37

\* Cash balance subject to bills for which requisitions have been made.