

**132.—REPORT OF THE OPERATIONS OF THE U. S. FISH COMMISSION  
STEAMER FISH HAWK, IN SHAD HATCHING, ON THE DELAWARE  
RIVER, SEASON OF 1885.**

**By L. W. PIEPMAYER,**

*Ensign, U. S. N., Commanding.*

I have the honor to make the following report of the operations of the steamer Fish Hawk in the shad-hatching work on the Delaware:

In obedience to your order of May 19, 1885, I proceeded on the next day down the Potomac River and Chesapeake Bay, and up the Delaware, arriving at Gloucester Point, New Jersey, at 1 p. m., May 23, having been detained at Cape Henry by heavy easterly squalls, and at Delaware Breakwater by a thick fog. Hoisted out steam-launch, and steamed down the river to interview fishermen.

*May 23.*—The first fishing shore I visited was owned by Howell & Hunt. Mr. Howell was at first decidedly averse to having any of our men handle his fish, stating that some men who had been there before the arrival of the Fish Hawk had handled his fish so roughly as to render them unsalable. I, however, finally persuaded him to give our men a trial, promising him that they should be very careful, and agreeing to pay for all fish they might spoil. I agreed to pay for all spawning shad 25 cents for each female, or \$10 per 1,000,000 for all impregnated eggs. For the use of milsters no compensation was allowed. This shore is known as the Gloucester Point fishery.

I next visited two other fisheries owned and managed by Rice & Bakeoven. They are the Howell's Cove fishery and the Eagle Point fishery. I made arrangements with both the managers, and found them disposed to assist.

I also made arrangements with a number of gillers, offering them \$20 per 1,000,000 for all impregnated eggs, in good condition, that they might deliver on board, and the same terms for such as they gave the spawn-takers as the owners of seines were to receive. All the gillers I talked with were favorably disposed, and seemed to appreciate the importance of the work.

It being Saturday afternoon all the seines had hauled up for Sunday, and no more fish will be taken until Monday morning. Mr. F. N. Clark joined the ship.

*May 25.*—I sent out five spawn-takers, two to Gloucester Point, two to Howell's Cove, and one to Eagle Point. Three of my men, under instructions at Havre de Grace, had not returned, but arrived in the afternoon.

The New Jersey fish commission came on board and inspected the hatching apparatus. They urged the advisability of having the Fish Hawk co-operate with them in their hatching operations about Trenton later in the season.

At 5 p. m. I got under way and steamed down the river about 6 miles, and at 6 p. m. anchored off Faunce's fishery. Mr. Clark and I visited Faunce's seine haul, and another owned by the Bakeoven Brothers. Made arrangements with both to procure spawn. Got 98,000 eggs from Faunce's in the one haul we were able to attend, 504,000 from Howell's Cove, 266,000 from Eagle Point; total, 868,000 eggs. No returns from Gloucester Point.

*May 26.*—Early in the morning I finished the examination of the fishing shores. There is one just above Billingsport, and one about 2 miles below. The one above is owned by one of the Faunces, and the one below by Bennett Brothers. The one just above Billingsport cut out in the evening. The total number of eggs received this day was 434,000. But few fish were caught; total to date, 1,302,000. We have as yet received no eggs from Gloucester Point, and the gillers are doing very poorly, catching very few, and none ripe.

In the evening I anchored above the Schuykill, with the idea of avoiding the oil coming out of that river.

*May 27.*—The total number of eggs taken to-day was 943,000. Of this number 167,000 were taken from gillers. One giller refused to allow his fish to be overhauled because the spawn-taker could not pay cash. In future I shall provide my men with a little money, so as to be prepared for a similar case.

Mr. Clark's assistants arrived to-day. They went out among the gillers, but were unsuccessful. No eggs have as yet been obtained from Gloucester Point. The eggs put in the cones and jars on the 25th and 26th are doing well. Some of the 25th are nearly hatched out.

*May 28.*—The spawn-takers got 677,000 eggs to-day, 64,000 from Howell's Cove, 457,000 from Bennett's fishery, and 156,000 from Eagle Point; total to date, 2,922,000. Five shores were attended.

*May 29.*—Result of the day's work as follows: Howell's Cove, 640,000; Faunce's, 110,000; Bennett Brothers, 143,000; total, 893,000; total to date, 3,815,000.

Yesterday 156,000 eggs were taken from one shad at Eagle Point fishery, owned by Rice & Bakeoven. The eggs were brought in by Jacob Svedlin, quartermaster, and carefully measured. He stated that he had stripped only one shad. Mr. Clark and I visited the fishery this morning and obtained the corroborative evidence of Mr. Bakeoven and one of the men. I am satisfied that it is true. The fish weighed about 6 pounds.

Eggs and young fish apparently in good condition. A few dead eggs have been removed from the surface.

*May 30.*—Spawn was obtained from Howell's Cove, 160,000 eggs from two fish. No haul was made later than 4 p. m., all the seines being hauled up for Sunday.

This afternoon I took 250,000 young fish down to Rice & Bakeoven's fisheries, to show the fishermen some of the results of the hatching

work. The exhibition aroused considerable enthusiasm, both owners and employees examining the small fry with great interest. They are quite enthusiastic, and help our men in every possible way. After they had all seen and examined the fish I put the fry overboard.

*June 1.*—This being Monday, with the wind in a favorable direction, the catch was large and the yield of spawn was in proportion. We got from Howell's Cove 1,025,000, from Faunce's 350,000, from Bennett's 362,000; total for the day, 1,737,000; total to date, 5,712,000. Gloucester Point has not yet furnished any eggs. I have taken the spawn-takers away from that shore and shall utilize them among the gillers. The launch being disabled I attended the boats with the ship and anchored in the evening off Faunce's fishery, below Red Bank. I took young fish ashore at Faunce's and Bennett's, and after showing them I put them overboard in deep water. I have deposited up to date 985,000 young fry.

*June 2.*—Received spawn as follows: Howell's Cove, 454,000; Bennett's, 260,000; Faunce's, 148,000; total, 862,000. Sent spawn-takers among the gillers, but without results.

*June 3.*—Number of eggs received to-day, 1,004,000, as follows: 184,000 from Bennett's, 692,000 from Howell's Cove, 128,000 from Eagle Point. Deposited yesterday and to-day, 1,100,000.

*June 4.*—All the fisheries except Howell's Cove have cut out. From this fishery we obtained to-day 1,120,000 eggs. Rice & Bakeoven are barely making expenses, but will hold on until next Monday in the hope of a good haul after Sunday. The proportion of ripe fish is increasing, but the number of fish caught is decreasing. Put over to-day 1,170,000 young fish.

*June 5.*—Obtained 564,000 eggs to-day, making a total of 9,270,000. Deposited 496,000 young fry.

*June 6.*—No ripe fish to-day. At noon the seine was hauled up for Sunday. Put overboard 700,000 young shad from eggs obtained on the 1st.

*June 8.*—Eight thousand eggs were obtained from gillers, but all died and were thrown overboard. They were in bad condition when received on board, owing to the rough weather.

*June 9.*—To-day 596,000 were obtained from Howell's Cove. Owing to the rough weather, the eggs were received in a bad condition, and I am afraid that only a small proportion will hatch out. The eggs were obtained by the spawn-takers at 10 p. m. and could not be put on board and in the hatching apparatus until 4 a. m. to-day. Deposited 1,346,000 young fish from eggs obtained on the 2d and 3d instants.

Eggs received to date, 9,874,000. Howell's Cove will cut out to-night. I have seen the owners in reference to continuing the fishing after the 10th, but find that the compensation for eggs will not induce them to fish after the close of the season, even if permission could be obtained.

Besides, the grass is so heavy that in a few days it would be almost impossible.

*June 10.*—Howell's Cove has cut out. Received last night 738,000 eggs. Deposited 896,000. Total number of eggs received during the season, 10,604,000. I shall proceed to Burlington, N. J., to finish hatching the eggs on board, and put them over at that place.

*June 11 and 12.*—Steamed up to Burlington, N. J., and lay there for two days. Put over 450,000 young fish. Found that only 200,000 of the eggs received on June 9 hatched out.

*June 13.*—I left Burlington and proceeded to Port Richmond, filled up with coal and stores, and steamed down the bay. Put over the remaining young fish, 670,000, which had just hatched out, off Billingsport.

REMARKS.—I regard the Delaware as an excellent field of operations for the Fish Commission during the shad season. At the time the Fish Hawk arrived there the fish had evidently been spawning for some time. We were told stories of much larger catches of fish than any that took place while we were there. Though it is probable that the proportion of ripe fish was not so great at that time, still out of these great numbers it is to be supposed that many spawning fish might have been obtained.

All the principal shores are from 4 to 12 miles below Philadelphia. What effect the oil and other impurities in the water may have on the young fish I am not prepared to state, though I have several times observed a sluggishness in their movements that I can ascribe to no other cause. I think it would be well if the young fish or the partly developed eggs could be transported to some point at least 10 miles above Philadelphia.

We have obtained by far the largest number of eggs from the Howell's Cove fishery, 7,156,000 out of a total of 10,604,000; while from the Gloucester Point fishery none were received.

The two shores almost join each other. The first is a comparatively retired cove, with a decided curve inland, well clear of the channel, while the other is a straight shore, near the channel, and near the Gloucester ferry slip.

Faunce's seine haul, though we did not get so many ripe fish there as at Bennett's, has a reputation for big roe shad. It is also well out of the main channel. It is said to have numerous springs at the bottom. Bennett's is also said to have springs at the bottom.

I think that with an earlier start next season, the work of this year can be doubled or trebled.

I append a table showing in statistical form the number of eggs received, proportion hatched out, time of hatching, disposition, temperature, &c.

Record of shad hatching on the Delaware River from May 25 to June 10, 1885.

Date.	Station.	Fishery.	Kind of fish.	Number of—			Time put in cones.	Time of hatching.	Number hatched.	Number deposited.	Time deposited.	Where deposited.	State of water.	Temperature of air.		Temperature in cones.	
				Males.	Females.	Eggs taken.								Max.	Min.	Max.	Min.
1885.																	
May 25	Fish Hawk	Howell's Cove	Shad	13	13	504,000	8.45 p. m.	5 <sup>1</sup> / <sub>2</sub>	380,000	380,000	May 30	Delaware River	Clear	79	57	68	65
25	do	Eagle Point	do	6	6	266,000	8.45 p. m.	5 <sup>1</sup> / <sub>2</sub>	215,000	215,000	May 31	do	do	79	57	68	65
25	do	Faunce's	do	4	3	98,000	9.45 p. m.	5 <sup>1</sup> / <sub>2</sub>	60,000	60,000	May 31	do	do	79	57	68	65
26	do	Eagle Point	do	5	5	95,000	8.30 p. m.	5 <sup>1</sup> / <sub>2</sub>	55,000	55,000	May 31	do	do	82	67	69	67
26	do	Howell's Cove	do	5	5	167,000	8.30 p. m.	5 <sup>1</sup> / <sub>2</sub>	150,000	150,000	June 1	do	do	82	67	69	67
26	do	Faunce's	do	8	6	172,000	9.00 p. m.	5	125,000	125,000	June 1	do	do	82	67	69	67
27	do	do	do	7	6	118,000	8.30 p. m.	5	100,000	100,000	June 2	do	Muddy	76	64	69	68
27	do	Rennett's	do	10	7	226,000	9.00 p. m.	5	200,000	200,000	June 2	do	do	76	64	69	68
27	do	Howell's Cove	do	12	12	422,000	9.30 p. m.	5	350,000	350,000	June 2	do	do	76	64	69	68
27	do	Giller's	do	3	3	167,000	11.30 p. m.	5	150,000	150,000	June 2	do	do	76	64	69	68
28	do	Howell's Cove	do	3	3	84,000	7.30 p. m.	5	60,000	60,000	June 2	do	Partly clear	74	60	68	66
28	do	Bennett's	do	15	10	457,000	9.30 p. m.	5	420,000	420,000	June 3	do	do	74	60	68	66
28	do	Eagle Point	do	2	1	156,000	9.45 p. m.	5	125,000	125,000	June 4	do	do	74	60	68	66
29	do	Howell's Cove	do	11	11	640,000	8.30 p. m.	5	515,000	515,000	June 4	do	do	72	56	67	67
29	do	Faunce's	do	8	3	110,000	8.30 p. m.	5	100,000	100,000	June 4	do	Muddy	72	56	67	67
29	do	Bennett's	do	5	5	143,000	9.00 p. m.	5	115,000	115,000	June 4	do	do	72	56	67	67
30	do	Howell's Cove	do	2	2	160,000	6.00 p. m.	5	135,000	135,000	June 4	do	do	69	57	66	66
June 1	do	Bennett's	do	7	7	196,000	7.30 p. m.	5	166,000	166,000	June 5	do	Partly clear	80	62	68	65
1	do	do	do	7	7	166,000	10.30 p. m.	5	155,000	155,000	June 5	do	do	80	62	68	65
1	do	Howell's Cove	do	20	20	1,025,000	10.00 p. m.	5	700,000	700,000	June 5	do	do	80	62	68	65
1	do	Faunce's	do	12	12	350,000	*2.00 a. m.	5	175,000	175,000	June 5	do	do	80	62	68	65
2	do	do	do	5	5	148,000	8.00 p. m.	5	74,000	74,000	June 7	do	do	78	64	68	67
2	do	Howell's Cove	do	14	14	454,000	9.00 p. m.	5	304,000	304,000	June 7	do	Clear	78	64	68	67
2	do	Bennett's	do	10	8	260,000	9.00 p. m.	5	200,000	200,000	June 7	do	do	78	64	68	67
3	do	do	do	5	5	92,000	10.45 p. m.	5	83,000	83,000	June 8	do	do	76	59	68	67
3	do	Howell's Cove	do	16	16	692,000	11.45 p. m.	5	500,000	500,000	June 8	do	do	76	59	68	67
3	do	Eagle Point	do	3	3	128,000	11.45 p. m.	5	102,000	102,000	June 8	do	do	76	59	68	67
3	do	Bennett's	do	2	2	92,000	11.45 p. m.	5	83,000	83,000	June 8	do	do	76	59	68	67
4	do	Howell's Cove	do	20	20	1,120,000	11.45 p. m.	5	896,000	896,000	June 8	do	Muddy	79	60	70	68
5	do	do	do	9	9	564,000	12.00 p. m.	5	450,000	450,000	June 12	do	do	83	59	72	70
8	do	Gill boat	do	1	1	8,000	10.00 p. m.	(f)				do	do	80	64	71	70
9	do	Howell's Cove	do	14	14	596,000	6.00 a. m.	4	200,000	200,000	June 13	Delaware River	do	68	56	70	69
10	do	do	do	12	12	738,000	1.00 a. m.	4	720,000	720,000	June 13	do	do	76	59	70	70
		Total		273	256	10,604,000			8,063,000	8,063,000							

\*2 a. m. of June 2.

†Died before hatching, and thrown overboard.