

88.—REPORT ON THE SHAD WORK OF THE STEAMER FISH HAWK DURING THE SEASON OF 1886.***By Mate JAMES A. SMITH, U. S. N.**

[Abstract.]

The shad work prosecuted by the U. S. Fish Commission steamer Fish Hawk during the season of 1886 covers the period from April 25 to June 3, inclusive. Most of the operations were conducted on the Delaware River, though some of the work in the first part of the season was done on the northern end of Chesapeake Bay.

On April 24 the Fish Hawk arrived at Battery Station from Wood's Holl, Mass., and on the 25th preparations for the season's work were begun. On the 26th the vessel proceeded across to the east side of the bay and took up a position in the mouth of North East River, from which the spawn-takers could conveniently visit the fishing-shores and the gillers in the vicinity, and arrangements were made for paying the fishermen for the ripe shad furnished. This work was continued until May 1, when orders were received to proceed to the Delaware River. Up to this time 2,192,500 eggs had been taken, which, on May 2, were transferred to Battery Station, and on the 3d the vessel proceeded down Chesapeake Bay bound for the Delaware.

On May 5 arrived in the Delaware River, and at 1 p. m. anchored off Gloucester City, N. J. This point was the headquarters for most of the subsequent operations on the river, as from it most of the gillers and fisheries could easily be reached by the spawn-takers. Found the U. S. Fish Commission steamer Lookout at anchor at this place, and on the 6th received from her 1,156,000 eggs. The Lookout was of assistance also by towing the spawn-boats to and from some of the various fishing-shores, and by transporting the spawn-takers. On May 6 the Fish Hawk steamed down the river, stopping at the different shores, where the proprietors were seen and arrangements made about paying them for shad spawn taken. At 10.30 p. m. of the 7th the vessel grounded on the mud-flats off the mouth of Mantua Creek, where she remained till 4 a. m. of the 8th.

On May 11 transferred to Dr. E. G. Shortlidge, of the Delaware fish commission, 660,000 eggs; while in the channel off Gloucester, deposited 1,140,000 fry from eggs obtained on the river. On the 12th went down the river to Wilmington, Del., where arrangements were made to

* This report was compiled from the records of Lieut. L. W. Piepmeyer, U. S. N., who was in charge of the vessel when the work was done.

repair steam-launch No. 55, just arrived from Battery Station. Sent to Dr. Shortlidge* 450,000 more eggs, after which returned to the usual anchorage off Gloucester. On the 13th launch No. 55 arrived from Wilmington and began to render service in distributing spawn-takers and tending the different fishing-shores. The fishermen reported a great decrease in the catch of shad for the week ending May 15, and attributed this to the constant easterly weather. Almost daily deposits of fry were made in the river, as will be seen from the appended table.

Owing to heavy rains the river was very muddy during the middle part of May, and some of the eggs in the jars and cones were covered with a muddy sediment and died. This led to the use of raw cotton in the jars for the purpose of filtering the water.

On May 27 William P. Sauerhoff reported for duty from Battery Station, to assist in shad-hatching work. On the 31st orders were received to discontinue gathering spawn.

On June 3 transferred to Dr. E. G. Shortlidge 180,000 fry; a shipment was also made to Philadelphia, in launch No. 55, of fifteen cans containing 1,940,000 fry, which were delivered to U. S. Fish Commission car No. 2. As there were no more eggs or fry on hand, this terminated the shad-hatching operations of the Fish Hawk for the season of 1886. Appended will be found a table giving details of the work, showing especially the number of eggs taken, the number of fish hatched, the number deposited, and the times and places of deposit, with other statements of particulars in this connection.

U. S. FISH COMMISSION STEAMER FISH HAWK,
Wood's Holl, Mass., October 11, 1886.

* Dr. Shortlidge reported that the general condition of the 1,110,000 eggs which he received from the Fish Hawk on May 11 and 12 was bad, as at least one-third were found dead on unpacking. The subsequent loss on these eggs was about one-eighth. All the fry were planted in the Brandywine Creek, near Wilmington. July 21 a small shad was caught in Brandywine Creek, supposed to have been one of those planted in May.

Record of shad operations by the Fish Hawk on the Susquehanna and Delaware Rivers, during the season of 1886.

Date.	Fishery.	Number of—			Time put in cones.	Time began hatching.	Number hatched.	Number deposited.	Time deposited.	State of water.	Temperature of surface.		Temperature in cones.	
		Males.	Females.	Eggs taken.							Max.	Min.	Max.	Min.
1886.														
Apr. 26	Red Bank.....	1	1	30,000	9.15 p. m.		(*)		Clear	67	65	64	64	
27	do.....	1	1	30,000	9.15 p. m.				do	65	65	65	63	
28	Gillers.....	5	8	150,000	1.50 a. m.				do	66	65	65	64	
28	do.....	9	6	180,000	3.00 a. m.				do	65	64	65	64	
28	Carpenter's Point.....	3	3	128,000	8.15 p. m.				Partly muddy	63	61	65	64	
28	Gillers.....	4	4	120,000	9.30 p. m.				do	61	60	65	64	
29	do.....	2	2	72,000	2.00 a. m.				do	62	61	65	64	
29	do.....	6	6	262,500	8.00 p. m.				do	62	60	63	63	
29	do.....	7	8	400,000	11.20 p. m.				do	62	60	63	63	
29	do.....	9	9	330,000	11.30 p. m.				do	62	60	63	63	
30	do.....	2	3	82,500	10.00 p. m.				do	63	61	63	63	
30	do.....	3	3	127,500	11.30 p. m.				do	63	61	64	62	
May 1	do.....	9	9	280,000	4.30 a. m.				do	61	60	63	63	
5	Faunce's.....	5	5	200,000	11.00 p. m.	May 10	160,000	160,000	(†) Muddy	61	59	61	61	
5	Eagle Point.....	1	1	40,000	11.00 p. m.	May 10	35,000	35,000	do	61	59	63	61	
6	Lookout.....	10	12	568,000		May 9	465,000	465,000	do	62	61	63	61	
6	do.....	8	10	588,000		May 9	480,000	480,000	do	62	61	63	61	
6	Faunce's.....	3	3	195,000	5.30 p. m.	May 10	170,000	170,000	do	62	61	63	61	
6	Howell's Cove.....	3	3	161,000	6.30 p. m.	May 10	140,000	140,000	do	62	61	63	61	
6	Gloucester Point.....	4	4	262,500	8.00 p. m.	May 10	220,000	220,000	do	62	61	63	61	
6	Howell's Cove.....	10	10	578,000	9.00 p. m.	May 10	470,000	470,000	do	62	61	63	61	
6	Eagle Point.....	3	3	157,500	11.00 p. m.	May 10	135,000	135,000	Partly muddy	62	61	63	61	
6	Faunce's.....	6	6	208,000	11.00 p. m.	May 10	166,000	166,000	do	62	61	63	61	
6	Woodbury.....	7	7	397,500	11.00 p. m.	May 10	320,000	320,000	do	62	61	63	61	
7	Lookout.....			500,000	7.00 a. m.	May 10	400,000	400,000	do	62	62	63	62	
7	Howell's Cove.....	2	2	75,000	7.30 p. m.	May 11	65,000	65,000	do	62	62	63	62	
7	Gloucester Point.....	8	8	583,000	7.30 p. m.	May 11	480,000	480,000	do	62	62	63	62	
7	Woodbury.....	5	5	240,000	11.00 p. m.	May 11	200,000	200,000	do	62	62	63	62	
7	Eagle Point.....	1	1	45,000	11.00 p. m.	May 11	40,000	40,000	do	62	62	63	62	
8	Faunce's.....	9	9	380,000	3.30 p. m.	May 12	345,000	345,000	do	61	61	61	60	
10	Howell's Cove.....	10	10	630,000	7.00 p. m.	May 15	450,000	450,000	do	62	61	62	60	
10	Faunce's.....	13	13	548,000	7.30 p. m.	May 15	400,000	400,000	do	62	61	62	60	
10	Bennett's.....	15	15	855,000	Midnight	May 15	400,000	400,000	do	62	61	62	60	
10	Woodbury.....	4	4	255,000	10.00 p. m.	May 15	160,000	160,000	do	62	61	62	60	
10	Howell's Cove.....	14	14	1,042,000	Midnight	May 15	191,000	191,000	do	62	61	62	60	

* All fry were deposited in the Delaware River, except as otherwise indicated.

† The 2,192,500 eggs taken in the Chesapeake were transferred to Battery Station on May 1.

‡ Delivered 660,000 eggs to Dr. E. G. Shortlidge on May 11.

Record of shad operations by the Fish Hawk on the Susquehanna and Delaware Rivers, during the season of 1886—Continued.

Date.	Fishery.	Number of—			Time put in cones.	Time began hatching.	Number hatched.	Number deposited.	Time deposited.	State of water.	Temperature of surface.		Temperature in cones.	
		Males.	Females.	Eggs taken.							Max.	Min.	Max.	Min.
1886.														
May 10	Gloucester Point.....	4	4	210,000	1.00 a. m.	May 15	170,000	170,000	May 17	Muddy.....	62	61	62	60
10	Faunce's.....	12	12	420,000	11.30 p. m.	May 15	335,000	335,000	May 17	do.....	62	61	62	60
11	Gloucester Point.....	1	1	37,000	4.00 p. m.	May 15	20,000	20,000	May 17	do.....	61	59	60	59
11	Howell's Cove.....	20	20	1,298,000	10.30 p. m.	May 16	1,046,000	1,046,000	May 17	do.....	61	59	60	59
11	Faunce's.....	12	12	457,500	11.00 p. m.	May 16	367,000	367,000	May 18	do.....	61	59	60	59
12	Woodbury.....	3	3	150,000	7.00 a. m.	May 17	120,000	120,000	May 18	do.....	59	59	60	59
12	Bennett's.....	22	22	*884,000	7.00 a. m.					do.....	59	59	60	59
12	Faunce's.....	7	7	309,000	7.30 p. m.	May 17	246,000	246,000	May 18	do.....	59	59	60	59
12	Howell's Cove.....	7	7	349,000	7.30 p. m.	May 17	280,000	280,000	May 18	do.....	59	59	60	59
12	Gillers.....	3	3	90,000	7.30 p. m.	May 17	80,000	80,000	May 18	do.....	59	59	60	59
12	Faunce's.....	13	13	510,000	9.00 p. m.	May 18	260,000	260,000	May 20	do.....	59	59	59	59
13	Howell's Cove.....	4	4	220,000	9.30 p. m.	May 18	110,000	110,000	May 20	do.....	59	59	59	59
14	Bennett's.....	7	7	345,000	9.30 p. m.	May 19	315,000	315,000	May 21	do.....	59	58	59	58
14	Woodbury.....	1	1	40,000	9.30 p. m.	May 19	32,000	32,000	May 22	do.....	59	58	59	58
14	Faunce's.....	6	6	190,000	9.30 p. m.	May 19	190,000	190,000	May 22	do.....	59	58	59	58
14	Howell's Cove.....	6	6	315,000	9.30 p. m.	May 19	283,000	283,000	May 21	do.....	59	58	59	58
15	Gloucester Point.....	2	2	120,000	6.00 a. m.	May 20	96,000	96,000	May 22	do.....	59	58	59	58
15	Howell's Cove.....	3	3	165,000	5.00 p. m.	May 20	140,000	140,000	May 24	do.....	59	58	59	58
15	Woodbury.....	1	1	23,000	8.00 p. m.	May 20	19,000	19,000	May 24	do.....	59	58	59	58
15	Faunce's.....	6	6	258,000	8.00 p. m.	May 20	206,000	206,000	May 24	do.....	59	58	59	58
17	Gloucester Point.....	2	2	100,000	5.30 p. m.	(1)				do.....	59	58	59	58
17	Howell's Cove.....	9	9	330,000	7.30 p. m.	May 22	265,000	260,000	May 24	Muddy.....	59	58	60	59
17	Faunce's.....	7	7	350,000	7.30 p. m.	May 22	280,000	275,000	May 24	do.....	59	58	60	59
17	Woodbury.....	5	5	155,000	8.00 p. m.	May 22	120,000	118,000	May 24	do.....	59	58	60	59
18	Gloucester Point.....	4	4	242,000	6.30 p. m.	May 22	205,000	200,000	May 24	do.....	60	59	60	59
18	Gillers.....	1	1	60,000	7.00 p. m.	May 22	55,000	55,000	May 24	do.....	60	59	61	60
18	Howell's Cove.....	22	22	1,100,000	8.00 p. m.	May 22	880,000	870,000	May 24	do.....	60	59	61	60
18	Faunce's.....	7	7	375,000	8.30 p. m.	May 22	310,000	300,000	May 24	do.....	60	59	61	60
18	Woodbury.....	1	1	46,000	8.30 p. m.	May 22	38,000	37,000	May 24	do.....	60	59	61	60
19	Gloucester Point.....	6	6	246,000	8.30 p. m.	May 23	208,000	205,000	May 25	do.....	64	60	61	60
19	Gillers.....	4	4	164,000	8.30 p. m.	May 23	150,000	150,000	May 25	do.....	64	60	60	60
19	Howell's Cove.....	36	36	1,815,000	8.30 p. m.	May 23	1,455,000	1,450,000	May 25	do.....	64	60	60	60
19	Faunce's.....	8	8	344,000	9.00 p. m.	May 23	290,000	280,000	May 25	do.....	64	60	60	60
19	Woodbury.....	2	2	67,000	8.30 p. m.	May 23	57,000	57,000	May 25	do.....	64	60	60	60
20	Gloucester Point.....	2	2	79,000	8.30 p. m.	May 24	70,000	70,000	May 26	do.....	61	60	61	61
20	Gillers.....	1	1	39,000	8.30 p. m.	May 24	36,000	36,000	May 26	do.....	61	60	61	61
20	Howell's Cove.....	21	21	1,140,000	9.30 p. m.	May 24	1,025,000	1,025,000	May 26	do.....	61	60	61	61
20	Faunce's.....	6	6	300,000	10.00 p. m.	May 24	275,000	275,000	May 26	do.....	61	60	61	61

20	Woodbury.....	3	3	135,000	10.00 p. m. . .	May 24	125,000	125,000	May 26	do	61	60	61	61
21	Faunce's.....	4	4	240,000	7.00 p. m. . .	May 24	225,000	225,000	May 26	do	62	60	62	60
21	Gloucester Point.....	5	5	262,000	8.30 p. m. . .	May 24	245,000	245,000	May 26	do	62	60	62	60
21	Howell's Cove.....	28	28	1,350,000	10.30 p. m. . .	May 24	830,000	830,000	May 26	do	62	60	62	60
22	Gloucester Point.....	1	1	30,000	9.00 a. m. . .	May 25	25,000	25,000	May 27	do	64	64	66	64
22	Faunce's.....	2	2	70,000	4.00 p. m. . .	May 25	60,000	60,000	May 27	do	64	64	66	64
22	Howell's Cove.....	5	5	390,000	5.00 p. m. . .	May 25	215,000	214,000	May 27	do	64	64	66	64
22	Gloucester Point.....	2	2	95,000	8.00 p. m. . .	May 25	85,000	85,000	May 27	do	64	64	66	64
24	do.....	1	1	35,000	9.00 a. m. . .	(§)					68	67	68	66
24	Howell's Cove.....	38	38	1,637,000	9.30 p. m. . .	May 27	1,050,000				68	67	68	66
24	Faunce's.....	23	23	1,024,000	9.30 p. m. . .	May 27	625,000	1,844,000	May 30	do	68	67	68	66
24	Gloucester Point.....	7	7	376,000	10.30 p. m. . .	May 27	169,000				68	67	68	66
25	Faunce's.....	20	20	632,000	9.30 p. m. . .	May 29	428,000				66	65	66	65
25	Howell's Cove.....	22	22	1,110,000	10.00 p. m. . .	May 29	742,000	1,495,000	June 2	do	66	65	66	65
26	do.....	9	9	465,000	8.00 p. m. . .	May 30	325,000				64	64	66	65
27	Faunce's.....	6	6	301,000	7.30 p. m. . .	May 30	252,000				65	65	65	65
27	Howell's Cove.....	29	29	1,111,000	7.30 p. m. . .	May 30	918,000				65	65	65	65
28	Faunce's.....	5	5	176,000	7.00 p. m. . .	May 31	160,000	(§)			65	65	65	65
28	Howell's Cove.....	16	16	718,000	8.30 p. m. . .	May 31	610,000				65	65	65	65
29	do.....	4	4	133,000	4.30 p. m. . .	May 31	90,000				65	65	65	65
29	Bennett's.....	4	4	115,000	5.30 p. m. . .	May 31	90,000				65	65	65	65
	Total.....	720	726	34,454,500			23,196,000	21,018,000						

* Four hundred and thirty-four thousand died, and 450,000 eggs were delivered to Dr. Shortlidge on May 12.

† All died.

‡ Lost overboard.

§ On June 3, 1,940,000 fry were shipped to U. S. Fish Commission car No. 2, and 180,000 fry were sent to Dr. Shortlidge.