

## XXV.—REPORT ON THE SHAD WORK OF THE STEAMER LOOK- OUT DURING THE SEASON OF 1886.

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The work in gathering, transferring, and hatching the spawn and depositing the fry of shad, performed by the U. S. Fish Commission steamer Lookout during the season of 1886, covered the time from April 27 to May 23, inclusive. The greater part of the eggs obtained came from the Delaware River, but about one-third were gathered at the northern end of Chesapeake Bay and its inflowing streams. Most of the eggs were transferred to Battery Station or to the Fish Hawk, while some were hatched on board and deposited from the Lookout. During the season 3,000,000 fry were received from Battery Station and deposited in the tributaries of the Upper Chesapeake.

The season's work began on April 27 in the mouth of the Susquehanna River, where the floats and gill-boats were visited, but no ripe spawn was obtained. On the 29th received 500,000 shad fry from Battery Station and deposited them in the mouth of North East River. From the gill-boats in this vicinity obtained 520,000 eggs, which were transferred the next day to Battery Station. On the 30th left this station, passed through the Chesapeake and Delaware Canal to the Delaware River, communicated with some of the fishing-shores, and late at night anchored off Gloucester City, N. J., a few miles below Philadelphia, which was a convenient point from which to visit many of the most important shad fisheries in the river.

On May 3 went to Wilmington, Del., for the purpose of having some repairs made, but returned to the spawn-taking work on the river during the afternoon. On the 5th the Fish Hawk arrived, and the Lookout received orders to co-operate with her in gathering spawn, in obedience to which, the work was carried on conjointly for several days. On the 8th passed through the canal to Chesapeake Bay, and proceeded to Battery Station.

On May 10 Commissioner S. F. Baird and Assistant Commissioner T. B. Ferguson came on board at Havre de Grace, and were taken to Battery Station. All the eggs obtained during the last few days were transferred to the station, and several deposits were made on that and subsequent days in the Susquehanna, North East, and Sassafras Rivers, of fry received from the station. Many of the fishing-shores and gill-ers in this region were visited almost daily, but comparatively small numbers of eggs were taken, as the shad were becoming scarce, and these were duly transferred to the station. On the 15th proceeded to Baltimore.

On May 18 left Baltimore and returned to Battery Station, where the gathering and transferring of spawn were resumed. On the 22d some of the fisheries had ceased operations and most of the gilliers on the east side of the bay had stopped fishing for the season, so the spawn-takers from the Lookout were sent out to gather spawn in the immediate vicinity of the station and to attend the gilliers above the station, which resulted in getting 218,000 eggs on the 22d and 23d.

On May 23, as the fishing season was about ended, orders were received to discontinue the operations by the Lookout.

Appended will be found tables giving records of the shad operations during the season and of meteorological observations made in the vicinity of Havre de Grace and on the Delaware River during a portion of the month of May. The total number of eggs procured by the crew of the vessel was 4,561,000.

TABLE I.—Record of shad operations conducted near Havre de Grace, Md., and on the Delaware River, on the U. S. Fish Commission steamer Lookout.

Date.	Ripe fish.		Eggs obtained.	Whence obtained.	Transferred to—		Fish deposited.	
	Males.	Females.			Battery Station.	Fish Hawk.	Number.	Place.
1886.								
Apr. 29	8	11	520,000	North East River.	520,000	.....	*500,000	Mouth of North East River.
30	8	5	185,000	Delaware River...	.....	.....	.....	
May 1	.....	.....	.....	.....	.....	.....	.....	Opposite Billings* port, Delaware River.
2	.....	.....	.....	.....	.....	.....	.....	
3	4	6	222,000	Delaware River...	.....	.....	.....	
4	11	14	904,000	do	.....	.....	.....	
5	9	11	637,000	do	.....	.....	.....	
6	7	11	500,000	do	.....	1,150,000	.....	
7	12	12	672,000	do	.....	500,000	150,000	
8	.....	.....	.....	.....	.....	.....	.....	In channel, oppo- site Battery Sta- tion.
9	.....	.....	.....	.....	.....	.....	50,000	
10	.....	.....	.....	Gilliers.....	992,000	.....	110,000	In channel, oppo- site Battery Sta- tion.
11	2	2	84,000	North East River.	84,000	.....	*1,500,000	
12	1	1	25,000	do	25,000	.....	.....	North East River, be- tween Carpenter* Point and Red Bank.
13	4	6	222,000	do	222,000	.....	*1,000,000	
14	2	3	110,000	do	110,000	.....	.....	Opposite Ordinary Point, Sassafras River.
15	.....	.....	.....	.....	.....	.....	.....	
16	.....	.....	.....	.....	.....	.....	.....	Opposite Ordinary Point, Sassafras River.
17	.....	.....	.....	.....	.....	.....	.....	
18	1	1	40,000	North East River.	49,000	.....	.....	
19	.....	.....	.....	.....	.....	.....	.....	Opposite Ordinary Point, Sassafras River.
20	3	4	130,000	North East River.	130,000	.....	.....	
21	3	3	83,000	do	83,000	.....	.....	
22	3	4	103,000	do	103,000	.....	.....	
23	4	5	115,000	do	115,000	.....	.....	
Total.	79	99	4,561,000	.....	2,433,000	1,650,000	3,310,000	

\* Received from Battery Station.

TABLE II.—Record of temperature observations made at Havre de Grace, Md., and on the Delaware River, on the U. S. Fish Commission steamer Lookout, from May 1 to May 10, 1886.

Date.	Temperature of air.			Temperature of surface water.			Temperature of bottom.			Condition of sky.		
	8 a. m.	4 p. m.	12 mid-night.	8 a. m.	4 p. m.	12 mid-night.	8 a. m.	4 p. m.	12 mid-night.	8 a. m.	4 p. m.	12 mid-night.
1886.	°	°	°	°	°	°	°	°	°			
May 1*	50	56	52	58	60	50	58	58	58	Overcast	Overcast	Overcast.
2	55	72	53	57	61	59	53	60	59	Clear ...	Clear ...	Clear.
3	70	80	54	62	62	59	-----	60	59	...do ...	Partly	Do.
4										...do ...	Cloudy.	Cloudy.
5	66	75	64	60	62	61	60	60	61	...do ...	Cloudy.	Overcast.
6	66	78	62	61	62	62	60	62	62	...do ...	...do ...	Overcast.
7	70	80	58	61	64	61	61	63	61	Cloudy	...do ...	Clear.
8	67	60	64	62	63	61	61	63	61	Clear ...	Rain.	Rain.
9	64	59	58	61	63	59	61	63	59	Cloudy	Cloudy	Cloudy.
10	60	75	70	58	64	61	58	63	60	Clear ...	Clear ...	Do.
	65	78	-----	60	62	-----	60	62	-----	Cloudy	...do ...	-----

  

Date.	Wind, direction.			Wind, intensity.			State of tide.		
	8 a. m.	4 p. m.	12 mid-night.	8 a. m.	4 p. m.	12 mid-night.	8 a. m.	4 p. m.	12 mid-night.
1886.									
May 1*			NE.	9	8	9	Flood .....	Ebb .....	Flood.
2	NE.	NE.	NE.	8	5	4	Ebb .....	...do ...	Do.
3	NE.	NE.	NE.	0	1	2	...do ...	...do ...	Do.
4	Calm.	SW.	SW.	1	3	2	...do ...	...do ...	Do.
5	SW.	SSW.	S.	1	3	2	...do ...	...do ...	Do.
6	SW.	SW.	SE.	4	7	8	...do ...	...do ...	Do.
7	NE.	NW.	S.	1	1	1	...do ...	...do ...	Do.
8	E.	NE.	NE.	3	8	10	...do ...	Flood .....	Do.
9	NE.	NE.	NW.	4	10	3	...do ...	Ebb .....	Do.
10	NW.	Calm.	Calm.	3	0	0	...do ...	...do ...	Do.
	SE.	Calm.	-----	2	0	-----	...do ...	...do ...	-----

\* The bottom thermometer in use was No. 5264.