

II.—REPORT ON THE WORK OF THE UNITED STATES FISH COMMISSION STEAMER FISH HAWK FOR TWO YEARS ENDING DECEMBER 31, 1884.

BY LIEUT. W. M. WOOD, U. S. N.

I have the honor to submit the following general report on the operations of the Fish Commission steamer Fish Hawk while under my command, detailed reports having been made to you on the completion of each service.

On the 20th of November, 1882, I relieved Lieut. Z. L. Tanner of the command of the vessel at the navy-yard, Washington, D. C. For the rest of the winter we remained at the yard overhauling, refitting, and preparing for the spring hatching season.

On the 15th of March, 1883, under orders from you, we made a trip to the mouth of the Potomac in search of a whale reported ashore on Smith's Point, to inspect the station at Saint Jerome, and to see how the early fisheries on the Lower Potomac were coming on. We heard nothing of the whale, and having completed the remainder of the duty returned to Washington on the 18th March.

On the 23d of the same month loaded with freight for station at Battery Island, near Havre de Grace, Md., and leaving Washington on the 24th touched at Saint Jerome, and arrived at Battery Station on the 25th. Left the Battery on the 27th with steam-launch in tow; ran down to Baltimore and coaled ship. Left Baltimore on the 29th and arrived in Washington on the morning of April 1, having touched at Saint Jerome and some of the Potomac fisheries on the way round.

Having taken on board all our hatching outfit, and a quantity of stores, boats, &c., for the newly-established station at Fort Washington, Md., we got under way on the morning of April 12; touched and landed stores, &c., at Fort Washington, and then proceeded, by your instructions, to the mouth of Quantico Creek, Va., where the vessel was established for hatching the spawn of shad, herring, perch, &c. We remained there until May 7, when our station was changed to the neighborhood of Glymont, Md. We finished the hatching season of 1883 at this point and returned to the navy-yard at Washington on the 28th of May.*

*Table of results already submitted.

The freshwater hatching outfit was now unrigged and experimental apparatus for hatching the spawn of the Spanish mackerel and other floating eggs taken on board.

Under orders from you we got under way on June 4, 1863, for a cruise down the Potomac, west side of Chesapeake Bay from Potomac River to Cape Henry, and from Cape Charles to Cherrystone Inlet, for the purpose of locating the number, size, catch, &c., of the trap-nets fished along those shores.*

This part of the instructions having been completed by June 12, we then commenced the investigation of the Spanish-mackerel fisheries. Many attempts were made to hatch and keep alive the young of this fish, but without success. We had no difficulty in hatching the eggs, but found it impossible to keep them alive for more than a few hours. In my special report on this subject I have advanced the only theory I can give to account for this lack of success.

On July 13 the Fish Hawk was driven ashore, from her anchorage in Lynn Haven Bay, by a heavy northerly squall. She was floated again on the morning of the 18th without any injury whatever. This was the only interruption to the summer's work on the Spanish mackerel until we left the Chesapeake, August 17, for Wood's Holl, Mass., arriving at this place August 20.*

On August 22 left Wood's Holl with some of the scientific corps for a dredging trip to the south of Martha's Vineyard. Commenced work in latitude $40^{\circ} 13'$ north, longitude $70^{\circ} 29'$ west on the morning of the 23d and returned to Wood's Holl the following night.* On the 27th of August carried out another party on a dredging and trawling trip, returning to Wood's Holl the same night, and on the 30th got under way and proceeded to New Bedford. Remained in New Bedford, having boilers repaired, until September 4, when we returned to Wood's Holl.

September 6 got under way with scientific party for dredging trip on south side of Martha's Vineyard, returning to Wood's Holl same night.

On September 23 went to the assistance of the steamer Decatur H. Miller, ashore on the Middle Ground, in Martha's Vineyard Sound. Found the Coast Survey steamer Blake and revenue steamer Dexter fast to her, and by our united efforts soon got her afloat.

October 9 made a trawling and dredging trip to Menemsha Bight, returning to Wood's Holl the same night.

October 14 and 15 loaded with specimens, stores, &c., for transportation to Washington. Got under way on the 16th, touched at Newport for coal, and arrived at navy-yard, New York, on the 20th. Received here scientific outfit, specimens, &c., from the United States steamer Yantic, just back from her arctic trip, for transportation to Washington. Left New York on the 26th, having taken on board 100 live lob-

* Table of results already submitted.

sters, to be transplanted to the waters of the Chesapeake Bay, in the hope that they would stock that locality.

Arrived in Hampton Roads on the evening of October 27, and deposited 92 of the lobsters near the Ripraps. Reached the navy-yard, Washington, October 30, and at once began unloading and sending freight to National Museum, Smithsonian Institution, and Armory.

On the 12th of November, left Washington for Saint Jerome for the purpose of surveying and stocking the oyster-beds in Saint Jerome Creek. Completed this duty and returned to Washington on the 26th, where we remained for the balance of this year, repairing boilers and overhauling the ship.

Under orders to proceed to the Saint Mary's River, Florida, to see if anything could be done in the way of hatching shad in that locality, we left Washington March 8, 1884, and touching at Norfolk, Va., and Charleston, S. C., arrived at Fernandina, Fla., on the morning of March 18. Left the same day for Saint Mary's, Ga., where we got a river pilot and proceeded up the Saint Mary's River to King's Ferry, Fla., at which place we arrived March 19. We found very few fish being caught and none of them in good condition, as stated in my special report; so after remaining here until March 31, returned to Fernandina, by your orders, to await further instructions. Left Fernandina April 3, for Georgetown, S. C., touching at Savannah, Ga., and Charleston, S. C.

After investigating the shad fisheries in Winyaw Bay, with a view to the propriety of establishing a station there for future work, we left Georgetown, S. C., on April 7th, and arrived in Washington on the 10th.

On April 24, left Washington on a cruise of investigation to the various fishing points of the Potomac River and lower Chesapeake Bay, returning to Washington April 28.

May 1 we left Washington for hatching work on the Upper Potomac and located near Bryant's Point, where we remained collecting eggs until May 27. On the 14th of May we ran up to Washington to carry the United States Fisheries Association down the river to visit the fisheries, afterwards resuming our station at Bryant's Point.

June 23 we left Washington for Saint Jerome, with coal and ice on board for that station. Arrived there the following day, and having discharged the coal and ice commenced repairs on and made preparations to launch the large barge, which we were ordered to transfer from here to Battery Station, Havre de Grace.

Launched barge July 2 and started up the bay with it and a steam-launch, which was also to be transferred, in tow. Arrived in Baltimore July 3, where we were ordered to pick up a large scow for Battery Island. Left Baltimore July 5, arriving at the Battery the same day, when the barge, launch, and scow were turned over to Mr. Hamlen, in charge of station.

July 7 left Havre de Grace with freight and another launch in tow

for Saint Jerome Station. Dropped the launch at Saint Jerome early on the morning of the 8th, and then proceeded to Washington, arriving at the navy-yard on the evening of that day.

On the 9th began receiving freight for Wood's Holl. Left Washington July 15, and arrived in New York, July 17. Having received a number of stores for Wood's Holl left New York on the 20th, touched at Noank, Conn., to pick up a scow to be towed to Wood's Holl, arriving at the latter place on the evening of July 21.

July 23 made a dredging and trawling trip to Gay Head with the Secretary of the Navy and party on board. July 30 proceeded to New Bedford, where the vessel was hauled out to have the bottom cleaned and copper repaired. She was launched again on the 31st, and returned to Wood's Holl August 1. On August 19 carried scientific party on dredging and trawling trip to Hawes Shoal, returning to Wood's Holl the same night.

On the morning of August 22 received from the steamer Gate City the officers and crew of United States steamer Tallapoosa, sunk during the night in Vineyard Sound by collision with the schooner J. S. Lowell. As soon as possible the Fish Hawk got under way and visited the scene of the wreck. After picking up the steam-launch and taking the remainder of the crew off the schooner, as we could be of no further assistance, we returned to Wood's Holl.

August 25 made a trawling trip with scientific party to Menemsha Bight, returning to Wood's Holl the same night. On September 2 a party was carried to the mouth of Buzzard's Bay on a trawling expedition, returning the same day. September 8 a dredging trip was made, with some of the scientific corps on board, to Vineyard Sound, returning same day to Wood's Holl.

On October 14 commenced loading with specimens and other freight for transportation to Washington. Sailed from Wood's Holl October 16, arriving at navy-yard, New York, on the morning of the 17th. Received here another lot of lobsters for transfer to the mouth of the Chesapeake. Got under way, bound for Washington, on the 18th of October. Entered the bay on the evening of the 19th, deposited the lobsters off Back River Light, and reached Washington on the evening of October 20.

Left Washington again on November 2 for a cruise on the oyster-beds of the Chesapeake Bay. The investigations during this trip were carried on by means of the usual appliances, such as dredges, tangle-bars, trawls, &c., and in addition at each locality a submarine diver was sent down who examined the condition of the bottom. His reports thereon are embodied in the notes accompanying my special report on this subject. On one occasion I put on his suit myself, and went down to see how far he could depend on eyesight. With the water a little turbid, as it usually is in the shoal waters of the Chesapeake, I found

it impossible to see anything. His investigations, therefore, were mostly by feeling.

During this trip we worked principally in Tangier Sound and off Saint Jerome Creek. We visited Crisfield, Baltimore, and Annapolis, Md., returning to Washington, November 27, 1884.

Having applied to be relieved from duty in the Fish Commission, I was, on December 31, 1884, detached from the Fish Hawk; and on that day I turned her over to the next in rank, Ensign L. W. Piepmeyer, U. S. Navy.

WASHINGTON, D. C., *August 10, 1885.*

Trawling record of the U. S. F. C. steamer Fish Hawk, August 23, 1883.

No. of station.	Bearings.		Temperature of water.		Depth (fathoms).	Character of bottom.	Direction of wind.	Use of trawl.				
	Latitude north.	Longitude west.	Surface.	Bottom.				Time when put over.	Time going down (minutes).	Time remained down (minutes).	Time heaving in.	Fathoms of wire rope out.
1156	40 13	70 29	67	45	60	Mud	South	6 a. m.	5	30		150
1157	40 14	70 29	70	45	62	Soft mud	do	6.35 a. m.	5	45		150
1158	40 16	70 31	67	45	62	Soft green mud	do	8 a. m.	5	45		180
1159	40 20	70 33	67½	44	55	Soft mud.	South, light	10.15 a. m.	5	30		
1160	40 24	70 35	70	43	41	Black mud	do	11.25 a. m.	10	25		100
1161	40 28	70 37	69	44	45	do	South, 2	12.45 p. m.	5			125
1162	40 32	70 39	68	40½	45	do	Southwest, 2	2.15 p. m.	5	25	10	125
1163	40 35	70 41	71	46	31	Sand and mud	do	3.25 p. m.	5	20	5	
1164	40 43	70 45	70	44	31	Mud	do	5 p. m.	5	20	6	100
1165	40 50	70 49	68	45	32	Gray sand	do	6.25 p. m.	5	25	5	100

Trawling record of the U. S. F. C. steamer Fish Hawk, August 23, 1883—Continued.

No. of station.	Specific gravities.			Specimens obtained.
	Surface.	Five fathoms.	Ten fathoms.	
1156				Phycis tenuis, 1; Citharichthys, 2.
1167	1.0234—70°			Phycis, 8; Merluccius bilinearis, 1.
1158	1.0235—67½°	1.0235—60½°	1.0236—67°	Phycis tenuis, many.
1159	1.0236—67½°	1.0238—67½°	*1.0238—67°	Phycis, 8.
1160	1.0236—70°	1.0238—68°	1.0239—67½°	Phycis tenuis, Phycis chuss, Merluccius bilinearis, few; Glyptocephalus cynoglossus, 3; Paralichthys oblongus, few; Flounders, 2 specimens; Enchelyopus, 4.
1161	1.0236—69°	1.0238—68°	1.0238—68°	Phycis, 2; Flounders, 2; species Lophius piscatorius, 2; Enchelyopus, 4; Merluccius, unknown species.
1162	1.0236—68°	1.0238—69°	1.0240—66°	Paralichthys oblongus, 4; Flounders, 2 species, 5; Merluccius, 1; Phycis, few; Sculpin, 1; Enchelyopus, 2; Lophius, 2; unknown, 1.
1163	1.0234—71°	1.0232—70°	1.0232—69°	Lophius, 1; Sculpin, 1; Merluccius, few; Phycis, few, two species; Paralichthys, few; Flounders, 2 species.
1164	1.0236—70°	1.0234—68°	1.0234—68°	Glyptocephalus, 2; Merluccius, 8; Phycis, 8; Sculpin, 1; Paralichthys, few; Flounders, few.
1165	1.0234—68°	1.0248—65°	1.0250—58°	

* Fifteen fathoms.