

XXIII.—REPORT OF SHAD PROPAGATION ON THE POTOMAC RIVER DURING THE SEASON OF 1886.

BY MARSHALL McDONALD.

The organization and conduct of the work was the same, in general, as during the season of 1885. The facilities for collecting eggs were greatly improved by substituting for the launch heretofore employed in the collection service the small steamer *Lilla*, chartered for the season, but at the close of the season purchased by the U. S. Fish Commission.

The eggs collected from the fishing-shores and gilliers were transferred to the field station at Fort Washington, where they were kept and developed until hardened, so as to permit safe transportation to Central Station, Washington. Here the hatching was completed, and the distribution of the fry conveniently made by car and messenger service. Several million eggs were retained and hatched at Fort Washington for stocking waters in the immediate vicinity of the station.

COST AND RESULTS OF THE WORK.

For the conduct of the work, in accordance with the program submitted and approved, the Commissioner authorized an expenditure not to exceed \$5,000. At Fort Washington Station the actual cost of collecting, developing, and transporting the eggs was \$2,879.90; at Central Station, for hatching and distribution, \$916.55; total, \$3,796.45. The total number of eggs obtained was 36,362,000, and the losses during incubation were 6,625,000, leaving the aggregate number furnished for distribution from the Potomac River stations 29,737,000. The percentage of loss during incubation was 18 per cent, and shows marked improvement over the results of previous seasons. The cost of production was \$127.66 per million, or 78 shad for each cent of expenditure.

FORT WASHINGTON STATION.

On March 26 the station was occupied by a small force. The men were employed in tarring and rigging the seine, cleaning up the shore, and getting everything in readiness for active work when the run of shad should begin.

The first haul of the Commission seine was made April 12, and the first ripe fish was taken on the 16th. The run of fish steadily increased from that time to the 22d, as did also the proportion of ripe females. On the afternoon and night of the 22d of April 3,503,000 shad eggs were taken and impregnated. This was the maximum number taken in one day during the season. The period of maximum production was from April 20 to 27, inclusive; the total production for the period referred to being 16,017,000, or nearly one-half of the entire number obtained during the season.

A comparison of the records of the seine-hauling in 1885 and 1886, for which seasons only we have reliable records, affords contrasts as interesting as they are perplexing. These may be summarized as follows:

Years.	Total catch.	Males.	Females.	Ripe females in total catch.	Ripe females to entire number of females.	Maximum production of eggs for entire river.	
						Date.	Period.
1885	2,696	<i>Pr. ct.</i> 45.7	<i>Pr. ct.</i> 54.3	<i>Pr. ct.</i> 9.0	<i>Pr. ct.</i> 17.0	May 16	May 5-11
1886	7,419	71.8	28.2	5.3	14.1	Apr. 22	Apr. 20-27

A considerable proportion of the excess of males was made up of small two-year-old "buck shad," called by the fishermen "skinners," which, being too small to count, are sold by the bunch. The preponderance of these during the season gives promise of an increased run of full-sized spawning fish in 1887.

Transportation of eggs.—The transfer of impregnated eggs from Fort Washington to Central Station was made by the steamer W. W. Corcoran, plying daily between Washington and Mount Vernon, the transportation being uniformly made on trays, by the "dry method," inaugurated by me in 1881. The total number of eggs forwarded from Fort Washington Station was 33,208,000. Of these 4,925,000 died in transit.

CENTRAL STATION.

The total number of eggs received in good condition, the number of eggs and fry distributed, and the average percentage of loss in hatching are given in the following summary for the season of 1886:

Eggs transferred to other stations.....	1,586,000
Fish distributed.....	24,997,000
Eggs lost in hatching, 7 per cent.....	1,700,000
Total eggs received alive from Fort Washington.....	28,283,000

The records of the station contain a history of each lot of eggs received from the Fish Commission seine, giving the temperature of impregnation, the maximum, minimum, and mean of water temperatures during the period of incubation, and the percentage of loss in hatching, data which it is important to preserve for reference, but which it is hardly necessary to publish.

Comparison of the catch of 1885 and 1886.—The catch of shad in the Potomac varies greatly from one season to another. The aggregate number* taken in 1885 was 157,697; in 1886 it was 275,422, the increase of 1886 over the previous season being 117,725.

* See reports of Gwynn Harris, inspector of marine products, in U. S. F. C. Bulletin, Vol. V, p. 192, and Vol. VI, p. 202.