

XXV.—STATISTICS OF THE SHAD-HATCHING OPERATIONS CONDUCTED BY THE UNITED STATES FISH COMMISSION IN 1881.

BY CHAS. W. SMILEY.

From the reports of the various persons in charge of shad-hatching stations during the spring of 1881, and from the reports of messengers in charge of shipments, I have prepared a series of six tables to show the operations at each station, and the seventh for a summary exhibit. From these it will appear that 87,441,000 eggs were obtained and hatched with an average loss of 20 per cent. A comparison with the number of shad hatched in previous years is of interest, and the constant increase gratifying.

Number of shad hatched:

1879	16,842,000
1880	29,473,000
1881	70,035,000
1872-1881 inclusive	172,423,350

Of the fish hatched, a part were deposited in waters near the several hatching stations, as follows:

Deposited in local waters:

1879	5,587,000
1880	7,864,600
1881	46,518,500

Of the fish hatched, the number transported to other waters was as follows:

Transported to other waters:

1879	10,002,500
1880	20,761,400
1881	23,516,500

The number of shad deposited within the waters of the different States the present year was as follows:

Connecticut	1,000,000
Delaware	940,000
District of Columbia	205,000
Georgia	1,800,000
Iowa	1,100,000

Kansas.....	200,000
Kentucky.....	707,000
Maine.....	1,150,000
Maryland.....	24,705,000
North Carolina.....	4,357,500
Ohio.....	1,020,000
Pennsylvania.....	3,500,000
Rhode Island.....	500,800
South Carolina.....	620,000
Tennessee.....	400,000
Texas.....	277,000
Virginia.....	24,280,000
West Virginia.....	175,000
Total.....	67,002,500

Fuller particulars of these deposits, the time, streams, places, &c., will be found in the tables of distribution—Tables VIII and IX.

For comparison with the number of shad sent to the various States in the years 1872-80, see summary tables published in another part of this volume.

TABLE I.—Record of shad-hatching operations conducted by United States steamer *Fish Hawk*, Lieut. Z. L. Tanner, commanding, at Capehart's Wharf, in Salmon Creek, Avoca, N. C., from April 12 to April 30, 1881.

Date.	Ripe shad taken.		Eggs obtained.	Eggs lost.	Fish released in local waters.	Transported to other waters.
	Males.	Females.				
April 12.....	8	3	66,000	66,000	.....	.....
13.....	2	2	66,000	.....	.....	.....
14.....	4	4	117,000	.....	.....	.....
15.....	1	1	34,000	.....	.....	.....
19.....	9	8	132,000	.....	.....	.....
20.....	3	3	107,000	.....	.....	.....
21.....	11	11	332,000	.....	.....	.....
22.....	21	21	649,000	149,000	.....	.....
23.....	18	18	489,000	89,000	.....	.....
25.....	28	28	929,000	41,500	.....	.....
26.....	84	32	979,000	52,000	.....	.....
27.....	32	30	931,000	16,000	.....	.....
28.....	11	10	298,000	41,000	.....	.....
29.....	13	13	432,000	84,000	498,000	.....
30.....	5	5	166,000	8,000	530,000	*3,029,500
May 1.....	.....	.....	.....	500,000	.....	.....
2.....	.....	.....	.....	379,000	.....	.....
Total.....	195	189	5,727,000	1,809,500	1,328,000	3,029,500

* Captain Tanner states that these eggs were transferred to North Carolina Fish Commission at various times.

TABLE II.—Record of shad-hatching operations conducted by M. McDonald, at Gunston and other places on the Potomac River, under the direction of the United States Fish Commission, from April 20 to May 30 inclusive, 1881.*

Date.	Length in fathoms of haul seines.	Shad taken.	Ripe females.	Eggs obtained.	Eggs lost.	Fish released in local waters.	Fish transported to other waters.	Where released in local waters.†
1881.								
April 20	5,000	3,534	4	125,000	.....	.....	.....	
21	5,000	2,470	1	25,000	.....	.....	.....	
22	5,000	2,801	5	150,000	.....	.....	.....	
23	5,000	3,597	.....	235,000	.....	.....	.....	
25	5,000	4,016	80	910,000	.....	.....	.....	
26	5,000	4,567	28	830,000	.....	.....	.....	
27	5,000	4,783	11	825,000	151,000	234,000	.....	Pomonkey, Md.
28	5,800	3,997	81	980,000	.....	.....	.....	
29	5,800	4,938	21	610,000	97,000	.....	.....	
30	5,800	5,046	20	570,000	.....	1,883,000	.....	Gunston, Va.
May 1	5,800	3,701	15	400,000	25,000	.....	.....	
2	5,000	2,635	20	510,000	175,000	625,000	.....	Gunston, Va.
3	6,650	7,007	50	1,420,000	.....	1,510,000	.....	Do.
4	6,650	5,178	90	2,320,000	.....	.....	.....	
5	6,650	5,678	90	2,225,000	50,000	.....	.....	
6	6,850	4,682	50	1,530,000	810,000	1,130,000	.....	Gunston, Va.
7	6,850	5,101	101	3,080,000	300,000	280,000	.....	Do.
8	.....	.....	.....	.....	133,000	.....	.....	
9	6,850	4,951	51	1,565,000	101,000	2,887,000	.....	Gunston, Va.
10	6,850	4,698	17	500,000	100,000	1,834,000	.....	Do.
11	6,850	2,977	41	1,220,000	118,000	1,730,000	.....	Do.
12	6,350	1,907	36	1,060,000	10,000	2,576,000	250,000	Do.
13	6,350	2,909	21	620,000	650,000	40,000	250,000	Do.
14	6,850	3,191	4	100,000	.....	.....	850,000	
15	6,350	2,059	17	510,000	330,000	.....	.....	
16	6,850	2,357	46	1,360,000	.....	2,585,000	.....	Gunston, Va.
17	6,650	2,840	63	1,880,000	.....	.....	.....	
18	6,650	1,835	162	4,870,000	.....	.....	.....	
19	6,650	1,797	27	800,000	1,620,000	.....	.....	
20	6,650	1,637	77	2,200,000	.....	1,125,000	.....	Gunston, Va.
21	6,650	1,656	30	900,000	.....	.....	1,000,000	
22	4,850	.....	.....	.....	.....	.....	300,000	
23	6,650	1,481	17	500,000	545,000	.....	1,100,000	
24	6,650	1,544	107	3,215,000	.....	5,490,000	800,000	Gunston, Va.
25	6,650	1,046	54	1,020,000	850,000	.....	.....	
26	2,850	1,481	4	120,000	.....	140,000	1,000,000	Gunston, Va.
27	850	1,554	43	1,200,000	200,000	.....	1,000,000	
28	850	1,397	74	2,200,000	250,000	1,905,000	.....	Fort Washington, Md.
29	850	828	12	375,000	.....	.....	.....	
30	650	1,144	.....	.....	370,000	1,090,000	400,000	Fort Washington, Md.
80	.....	.....	.....	.....	1,619,000	.....	.....	
Total ...	184,150	120,047	1,470	\$43,200,000	7,005,000	28,515,000	5,850,000	

* For a more detailed statement of this work see report of M. McDonald.

† For details of deposits of fish see tables of distribution.

‡ 220,000 of these eggs were used in experiments; the rest are unaccounted for; probably a loss of this amount 2,630,000 eggs were sent to navy-yard station.

TABLE III.—Record of shad-hatching operations conducted by Frank L. Donnelly, at Navy-Yard Station, Potomac River, under the direction of the United States Fish Commission, from May 4 to June 2, 1881.

Date.	Eggs obtained.	Eggs lost.	Fish released in local waters.	Fish transported to other waters.	Messenger in charge of transfer.*
1881.					
May 4	200,000	10,000	.....	.....	
5	200,000	5,000	.....	.....	
6	270,000	5,000	.....	.....	
7	370,000	10,000	.....	.....	
9	430,000	20,000	.....	.....	
10	300,000	10,000	105,000	85,000	J. Frank Ellis.
11	230,000	10,000	.....	.....	
12	65,000	5,000	.....	400,000	G. G. Davenport.
13	100,000	10,000	100,000	260,000	Do.
15	.....	.....	.....	410,000	N. Simmons and C. W. Schuermann.
16	35,000	2,000	.....	290,000	C. A. Stewart and C. W. Schuermann.
17	70,000	8,000	.....	.....	
18	180,000	10,000	.....	.....	
19	300,000	20,000	.....	220,000	H. E. Quinn.
20	865,000	65,000	.....	150,000	C. W. Schuermann.
21	450,000	.....	.....	.....	
22	.....	.....	.....	100,000	C. W. Schuermann.
23	375,000	.....	.....	.....	
24	500,000	.....	.....	.....	
25	11,000,000	.....	.....	170,000	N. Simmons.
26	.....	.....	.....	280,000	N. Simmons and C. A. Stewart.
27	1720,000	.....	.....	500,000	Geo. H. H. Moore
28	1120,000	.....	.....	.....	
29	.....	.....	.....	.....	
30	1355,000	13,465,000	.....	.....	
June 2	.....	200,000	.....	150,000	W. H. Jenkins, Jr.
Total ...	\$7,730,000	8,850,000	205,000	8,075,000	

* For final destination of these fish, see tables of distribution.

† Of these eggs, 2,630,000 were received from Potomac barges.

‡ Eggs unaccounted for; probably lost.

§ Of this number, 600,000 were reported turned over to M. McDonald on his assuming charge of the Navy-Yard Station.

TABLE IV.—Record of shad-hatching operations conducted by Frank N. Clark, at Havre de Grace, Md., on the Susquehanna River, under the direction of the United States Fish Commission, from May 15 to June 13, inclusive, 1881.

Date.	Eggs obtained.	Eggs lost.	Fish hatched.	Fish released in local waters.	Fish transported to other waters.	Messenger in charge of transfer.*
1881.						
May 15†	6,625,000	504,000	4,101,000	4,101,000	.....	J. P. Creveling.
16	275,000	64,000	1,566,000	560,000	1,000,000	
17	375,000	5,000	100,000	100,000	.....	
18	135,000	.....	.....	.....	.....	
19	105,000	.....	.....	.....	.....	
20	150,000	25,000	260,000	260,000	.....	
21	210,000	.....	.....	.....	.....	
22	400,000	.....	.....	.....	.....	
23	900,000	.....	.....	.....	.....	
24	1,410,000	.....	.....	.....	.....	
25	705,000	92,000	1,048,000	48,000	1,000,000	J. P. Creveling.
26	750,000	30,000	330,000	330,000	.....	
27	765,000	40,000	365,000	365,000	.....	
28	450,000	290,000	825,000	825,000	.....	
29	325,000	75,000	1,000,000	400,000	1,500,000	J. P. Creveling.
30	250,000	.....	675,000	.....	.....	
31	.....	110,000	925,000	400,000	900,000	C. W. Schuermann.
June 1	50,000	75,000	100,000	.....	.....	
2	.....	.....	260,000	.....	.....	

* For final destination of these fish, see tables of distribution.

† May 15 includes a number of previous days' operations which cannot be given specifically.

TABLE IV.—Record of shad-hatching operations, &c.—Continued.

Date.	Eggs obtained.	Eggs lost.	Fish hatched.	Fish released in local waters.	Fish transported to other waters.	Messenger in charge of transfer.
1881.						
June 3			115,000		775,000	C. W. Schuermann.
4	100,000					
6	300,000	10,000				
7	450,000		50,000			
8	800,000		40,000			
9				90,000		
10		150,000				
11			150,000			
12			450,000			
13			300,000	900,000		
Total ...	15,030,000	1,470,000	13,560,000	8,385,000	5,175,000	

* Remained on hand at close of daily reports; probably deposited in local waters.

TABLE V.—Record of shad-hatching operations conducted by Marshall McDonald, at Navy-Yard Station, Potomac River, under the direction of the United States Fish Commission, from June 1 to June 25, inclusive, 1881.*

Date.	Length in fathoms of visited—		Shad taken.	Ripe females.	Eggs obtained.	Eggs lost.	Fish transported to other waters.	Messenger in charge of transfer.
	Haul-seines.	Gill-nets.						
June 1					†60,000			W. H. Jenkins, jr.
2			471	4	75,000		300,000	
3	550	7,200	140	2	40,000			F. L. Donnelly.
4	250	7,200	205	13	880,000		120,000	
5	250	7,200	221	6	175,000	150,000		J. F. Ellis.
6	250	7,200	209	10	250,000			
7	250	7,200	153	12	870,000	10,000	100,000	C. J. Huske.
8	250	7,200	130	4	75,000		200,000	H. E. Quinn.
9		7,200				20,000	200,000	N. Simmons.
10		7,200						
11		3,200			45,000		200,000	G. G. Davenport.
12		3,200		12	330,000		150,000	Ellis and Moore.
13		3,200		25	450,000		670,000	
14		3,200		10	270,000			Quinn, Schuermann, and Simmons.
15		3,200		7	200,000			
16		3,200		11	200,000	60,000		F. N. Clark.
17		3,200		6	170,000		400,000	
18		3,200						J. F. Ellis.
19		3,200		1	10,000		200,000	
20								C. A. Stewart.
21		3,200		2	40,000		1,140,000	
22		3,200		2	40,000		120,000	
23		3,200						
24		3,200						
25		3,200			30,000			
Total ...	2,050	100,000	1,538	127	8,840,000	240,000	3,800,000	

* For a more detailed statement of this work, see report of M. McDonald.
† Received from Frank L. Donnelly's navy-yard station.

TABLE VI.—*Record of shad-hatching operations conducted by United States steamer Fish Hawk, Lieut. Z. L. Tanner commanding, at Havre de Grace, Md., in the Susquehanna and North East Rivers, from May 5 to June 5, 1881.*

Date.	Ripe shad taken.		Eggs obtained.	Eggs lost.	Fish released in local waters.	Fish transported to other waters.
	Males.	Females.				
May 5.....	6	6	182,000			
6.....	17	17	462,000			
8.....	21	21	506,000			
9.....	49	47	1,660,000			
10.....	11	11	341,000			
11.....	28	28	913,000			
12.....	80	80	979,000		680,000	
13.....	8	8	265,000		1,680,000	
14.....	9	9	348,000		830,000	
15.....	14	12	857,000		598,000	
16.....	10	11	357,000		979,000	
17.....	10	13	424,000			
18.....	9	8	267,000		498,000	
19.....	12	14	423,000		166,000	
20.....	20	25	781,000			
21.....	53	54	1,792,000			
22.....	18	19	291,000			
23.....	17	23	650,000		325,000	
24.....	14	15	462,000		813,000	
25.....	28	81	781,000		275,000	
26.....	40	43	1,062,000		406,000	
27.....	22	22	625,000		1,250,000	
28.....	22	25	675,000		500,000	
29.....	10	10	869,000			
30.....	2	2	50,000		1,000,000	
31.....	6	6	106,000			1,250,000
June 1.....	8	8	187,000			500,000
2.....	2	2	88,000		625,500	812,000
3.....	2	2	50,000			125,000
4.....	2	2	50,000			
5.....						800,000
Total.....	500	524	15,444,000	2,871,500	10,085,500	2,487,000

TABLE VII.—Summary of work at shad-hatching stations operated by the United States Fish Commission during the spring of 1881.

Dates.		Location of stations.		Person in charge of station.	Eggs obtained.	Eggs lost.	Fish hatched.	Fish released in local waters.	Fish transported to other waters.
Season began.	Season ended.	Water.	Place.						
.....	.....	Albemarle Sound	Avoca, N. C.	Z. L. Tanner	5,727,000	1,369,500	4,357,500	1,328,000	3,029,500
April 20	May 30	Potomac River	Barges	M. McDonald	40,570,000	7,905,000	32,665,000	26,515,000	5,950,000
May 4	June 2	do	Navy-Yard	F. L. Donnelly	7,130,000	3,850,000	3,280,000	205,000	3,075,000
May 15	June 13	Susquehanna River	Harre de Grace, Md	F. N. Clark	15,030,000	1,470,000	13,560,000	8,385,000	5,175,000
June 1	June 25	Potomac River	Navy-Yard	M. McDonald	3,840,000	240,000	3,600,000	.....	3,800,000
May 5	June 5	Susquehanna River	Harre de Grace, Md	Z. L. Tanner	15,444,000	2,871,500	12,572,500	10,085,500	2,487,000
					87,741,000	17,706,000	70,035,000	46,518,500	23,518,500

* The tables of distribution show the destination of 67,353,000 of these fish. There were also used for experiments at Annapolis 180,000, and for Minnesota experiments 40,000. The remaining 2,462,000 either died before delivery to messengers or were deposited without a record being made.

TABLE VIII.—Chronological record of distribution of young shad made under the direction of the United States Commissioner of Fish and Fisheries, from April 27, 1881, to June 22, 1881.

Date.	Where fish were hatched.	Number of fish—		Introduction of fish.				Transfer in charge of—
		Started with.	Actually planted.	State.	Town or place.	Stream.	Tributary of—	
April 12-30	Steamer Fish Hawk ..	3, 029, 500	3, 029, 500					
29	do	498, 000	498, 000	North Carolina ..	Avoca	Salmon Creek	Albemarle Sound	Z. L. Tanner.
30	do	830, 000	830, 000	do	do	do	do	Do.
27	Potomac barges	234, 000	234, 000	Maryland	Pomonkey	Potomac River	Chesapeake Bay	M. McDonald.
30	do	1, 363, 000	1, 363, 000	Virginia	Gunston	do	do	Do.
May 2	do	625, 000	625, 000	do	do	do	do	Do.
5	do	1, 510, 000	1, 510, 000	do	do	do	do	Do.
6	do	1, 130, 000	1, 130, 000	do	do	do	do	Do.
7	do	230, 000	230, 000	do	do	do	do	Do.
9	do	2, 887, 000	2, 887, 000	do	do	do	do	Do.
10	do	1, 834, 000	1, 834, 000	do	do	do	do	Do.
10	Navy-yard	85, 000	85, 000	Maryland	Cumberland	do	do	J. F. Ellis.
10	do	105, 000	105, 000	Dist. of Columbia ..	Washington	do	do	F. L. Donnelly.
11	Potomac barges	1, 730, 000	1, 730, 000	Virginia	Gunston	do	do	M. McDonald.
12	do	2, 571, 000	2, 571, 000	do	do	do	do	Do.
12	Steamer Fish Hawk ..	660, 000	660, 000	Maryland	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
12	Potomac barges	250, 000	250, 000	do	Weaverton	Potomac River	Chesapeake Bay	N. Simmons.
12	Navy-yard	460, 000	460, 000	do	Laurel	Patuxent River	do	G. G. Davenport.
13	Potomac barges	40, 000	40, 000	Virginia	Gunston	Potomac River	do	M. McDonald.
13	Navy-yard	260, 000	260, 000	Maryland	Laurel	Patuxent River	do	G. G. Davenport.
13	do	100, 000	100, 000	Dist. of Columbia ..	Washington	Potomac River	do	F. L. Donnelly.
13	Steamer Fish Hawk ..	1, 660, 000	1, 660, 000	Maryland	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
14	Potomac barges	250, 000	250, 000	do	Point of Rocks	Potomac River	Chesapeake Bay	N. Simmons.
14	do	175, 000	175, 000	do	Relay House	Patapsco River	do	G. G. Davenport.
14	Steamer Fish Hawk ..	830, 000	830, 000	do	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
15	Potomac barges	175, 000	175, 000	West Virginia	Wheeling	Ohio River	Mississippi River	J. F. Ellis.
15	Navy-yard	300, 000	300, 000	Maryland	Laurel	Patuxent River	Chesapeake Bay	N. Simmons.
15	Steamer Fish Hawk ..	593, 000	593, 000	do	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
16	Potomac barges	2, 585, 000	2, 585, 000	Virginia	Gunston	Potomac River	Chesapeake Bay	M. McDonald.
16	Havre de Grace	4, 101, 000	4, 101, 000	Maryland	Battery Island	Susquehanna River	do	F. N. Clark.
16	Steamer Fish Hawk ..	979, 000	979, 000	do	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
17	Havre de Grace	566, 000	566, 000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
17	Navy-yard	200, 000	200, 000	South Carolina	Charlotte	Catawba River	Waterlee River	C. W. Schermann.
17	Havre de Grace	1, 000, 000	1, 000, 000	Pennsylvania	Sunbury	Susquehanna River	Chesapeake Bay	J. P. Creveling.
18	do	100, 000	100, 000	Maryland	Battery Island	do	do	F. N. Clark.
18	Steamer Fish Hawk ..	498, 000	498, 000	do	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.
18	Navy-yard	200, 000	200, 000	Kentucky	Bowling Green	Barton River	Green River	C. A. Stewart.
19	do	220, 000	170, 000	Ohio	Defiance	Maumee River	Lake Erie	H. E. Quinn.
19	Steamer Fish Hawk ..	168, 000	168, 000	Maryland	Havre de Grace	North East River	Susquehanna River	Z. L. Tanner.

20	Navy-yard	150,000	150,000	do	Laurel	Patuxent River	Chesapeake Bay	C. W. Schnermann.
20	Potomac barges	1,125,000	1,250,000	Virginia	Gunston	Potomac River	do	M. McDonald.
21	Harre de Grace	260,000	260,000	Maryland	Battery Island	Susquehanna River	do	F. N. Clark.
21	Potomac barges	1,000,000	1,000,000	do	Denton	Choptank River	do	T. B. Ferguson.
23	Steamer Fish Hawk	325,000	325,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
24	Potomac barges	5,490,000	5,490,000	Virginia	Gunston	Potomac River	Chesapeake Bay	M. McDonald.
24	Navy-yard	200,000	192,000	Kentucky	High Bridge	Kentucky River	Ohio River	C. A. Steuart.
24	Steamer Fish Hawk	313,000	313,000	Maryland	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
25	Potomac barges	1,000,000	1,000,000	Georgia	Macon	Ocmulgee River	Altamaha River	C. W. Schnermann.
25	Steamer Fish Hawk	275,000	275,000	Maryland	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
26	Potomac barges	140,000	140,000	Virginia	Gunston	Potomac River	Chesapeake Bay	M. McDonald.
26	Harre de Grace	1,000,000	1,000,000	Pennsylvania	Mifflin	Juniata River	Susquehanna River	J. P. Creveling.
26	do	48,000	48,000	Maryland	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
26	Steamer Fish Hawk	406,000	406,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
27	Harre de Grace	330,000	330,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
27	Navy-yard	500,000	500,000	do	Laurel	Patuxent River	do	Geo. H. H. Moore.
27	do	200,000	175,000	Kentucky	Shepherdsville	Salt River	Rolling River	C. A. Steuart.
27	Potomac barges	1,000,000	850,000	Ohio	Steuenville	Ohio River	Mississippi River	N. Simmons.
27	Steamer Fish Hawk	1,250,000	1,250,000	Maryland	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
28	Harre de Grace	365,000	365,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
28	Fort Washington	1,905,000	1,905,000	do	Fort Washington	Potomac River	do	M. McDonald.
28	Steamer Fish Hawk	500,000	500,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
29	Harre de Grace	825,000	825,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
30	do	400,000	400,000	do	do	do	do	Do.
30	do	1,500,000	1,500,000	Pennsylvania	Newport	Juniata River	Susquehanna River	J. P. Creveling.
30	Fort Washington	1,095,000	1,095,000	Maryland	Fort Washington	Potomac River	Chesapeake Bay	M. McDonald.
30	Steamer Fish Hawk	1,000,000	1,000,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
31	Potomac barges	1,000,000	1,000,000	Virginia	Lynchburg	James River	Chesapeake Bay	J. F. Ellis.
June 1	Harre de Grace	500,000	500,000	Maryland	Battery Island	Susquehanna River	do	F. N. Clark.
1	do	1,000,000	940,000	Delaware	Seaford	Nanticoke River	do	C. W. Schnermann.
1	Navy-yard	200,000	200,000	Kentucky	Mumfordsville	Green River	Ohio River	C. A. Stenart.
1	do	200,000	200,000	Georgia	Crawfordsville	Oconee River	Altamaha River	N. Simmons.
1	do	220,000	220,000	South Carolina	Railroad Crossing	Pedee River	Atlantic Ocean	H. E. Quinn.
2	do	150,000	150,000	Maryland	Laurel	Patuxent River	Chesapeake Bay	W. H. Jenkins, jr.
2	Steamer Fish Hawk	625,500	625,500	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
2	Harre de Grace	1,000,000	1,000,000	Connecticut	Warehous Point	Connecticut River	Long Island Sound	C. W. Schnermann.
3	do	500,000	500,000	Rhode Island	Warren	Palmer's River	Narragansett Bay	H. E. Quinn.
4	Navy-yard	120,000	120,000	Maryland	Weaverton	Potomac River	Chesapeake Bay	F. L. Donnelly.
7	Harre de Grace	100,000	100,000	do	Battery Island	Susquehanna River	do	F. N. Clark.
8	Navy-yard	200,000	200,000	South Carolina	Columbia	Congaree River	Santee River	C. J. Huske.
9	do	200,000	200,000	Georgia	Crawfordsville	Little River	Savannah River	H. E. Quinn.
9	Harre de Grace	90,000	90,000	Maryland	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
13	Navy-yard	100,000	100,000	Georgia	Albany	Flint River	Appalachicola River	N. Simmons.
13	do	100,000	100,000	do	Montezuma	do	do	F. L. Donnelly.
14	do	150,000	135,000	Texas	Railroad Crossing	Sabine River	Gulf of Mexico	G. G. Davenport.
15	do	58,000	58,000	do	Anstin	Colorado River	do	G. H. H. Moore.
15	do	32,000	30,000	do	Railroad Crossing	San Marcos River	do	G. G. Davenport.
15	do	28,000	28,000	do	do	Brazos River	do	Do.
15	do	32,000	30,000	do	do	San Antonio River	do	Do.
15	do	525,000	525,000	Maine	Waterville	Kennebec River	Atlantic Ocean	J. F. Ellis.

* Captain Tanner states that he turned these over to S. G. Worth, superintendent of fisheries of North Carolina.

TABLE VIII.—Chronological record of distribution of young shad, &c.—Continued.

Date.	Where fish were hatched.	Number of fish.		Introduction of fish.				Transfer in charge of—
		Started with.	Actually planted.	State.	Town or place.	Stream.	Tributary of—	
June 15	Havre de Grace.....	625,000	625,000	Maine	Mattawamkeag.....	Mattawamkeag River.	Penobscot River.....	J. F. Ellis.
18	Navy-yard	200,000	200,000	Georgia.....	Milledgeville.....	Oconee River	Altamaha River	H. E. Quinn.
20	 do	200,000	200,000	Tennessee.....	Johnsonville.....	Tennessee River.....	Ohio River	N. Simmons.
20	 do	200,000	200,000	Kansas	Kansas City	Missouri River	Mississippi River.....	F. N. Clark.
24	 do	1,140,000	1,106,000	Iowa	Dubuque	Mississippi River.....	Gulf of Mexico	J. F. Ellis.
24	 do	60,000	60,000	Tennessee.....	Union Depot.....	Holston River	Tennessee River	C. A. Stenart.
24	 do	70,000	70,000	 do	Fullen's	Nalachucky River.....	 do	Do.
24	 do	70,000	70,000	 do	Carter's Depot.....	Wantaga River.....	 do	John Horan.
		67,353,000	67,063,000					

NOTE.—Since the preparation of these tables a report has been received from Mr. S. G. Worth, from which it appears that instead of the number given as "actually planted" April 12-30, three items should be inserted which aggregate 1,709,500 less. Hence this number should be deducted from the total in the above table. Mr. Worth says: "The only thing received by me was 1,800,000 eggs at 5.30 p. m. April 30. They were estimated on board the Fish Hawk. From these I released on May 1st 700,000 shad fry into Salmon Creek; on May 4th, 200,000 at Moncure, into Haw River, a tributary to the Cape Fear River; and on May 5th, 360,000 into Salmon Creek, making a total of 1,260,000. The other 540,000 eggs were lost in hatching."

After the retirement of the Fish Hawk, however, Mr. Worth, in behalf of the State of North Carolina, took 4,632,000 eggs, from which he hatched out and released 3,485,000 more shad. (See Report of Board of Agriculture, session of 1883, pp. 64, 65.)

TABLE IX.—Geographical record of distribution of young shad made under the direction of the United States Commissioner of Fish and Fisheries from April 27, 1881, to June 22, 1881.

Date.	Where fish were hatched.	Number of fish—		Introduction of fish.				Transfer in charge of—
		Started with.	Actually planted.	State.	Town or place.	Stream.	Tributary of—	
June 3	Harre de Grace	1,000,000	1,000,000	Connecticut	Warehouse Point..	Connecticut River....	Long Island Sound....	C. W. Schuermann.
	do	1,000,000	940,000	Delaware	Seaford	Nanticoke River	Chesapeake Bay	Do.
May 10	Navy-yard	105,000	105,000	Dist. of Columbia	Washington	Potomac River	do	F. L. Donnelly.
13	do	100,000	100,000	do	do	do	do	Do.
25	Potomac barges	1,000,000	1,000,000	Georgia	Macon	Ocmulgee River	Altamaha River	C. W. Schuermann.
June 1	Navy-yard	200,000	200,000	do	Crawfordsville....	Oconee River	do	N. Simmons.
9	do	200,000	200,000	do	do	Little River	Savannah River	H. E. Quinn.
13	do	100,000	100,000	do	Albany	Flint River	Appalachicola River..	N. Simmons.
18	do	100,000	100,000	do	Monteruma	do	do	F. L. Donnelly.
18	do	200,000	200,000	do	Milledgeville	Oconee River	Altamaha River	H. E. Quinn.
24	do	1,140,000	1,106,000	Iowa	Dubuque	Mississippi River	Gulf of Mexico	J. F. Ellis.
20	do	200,000	200,000	Kansas	Kansas City	Missouri River	Mississippi River	F. N. Clark.
May 18	do	200,000	200,000	Kentucky	Bowling Green	Barren River	Green River	C. A. Stenart.
24	do	200,000	192,000	do	High Bridge	Kentucky River	Ohio River	Do.
27	do	200,000	175,000	do	Shepherdsville	Salt River	Rolling River	Do.
June 1	do	200,000	200,000	do	Mumfordsville	Green River	Ohio River	Do.
15	do	525,000	525,000	Maine	Waterville	Kennebec River	Atlantic Ocean	J. F. Ellis.
15	Harre de Grace	525,000	525,000	do	Mattawamkeag	Mattawamkeag River..	Penobscot River	Do.
April 27	Potomac barges	234,000	234,000	Maryland	Pamunkey	Potomac River	Chesapeake Bay	M. McDonald.
May 10	Navy-yard	85,000	85,000	do	Cumberland	do	do	J. F. Ellis.
12	Potomac barges	250,000	250,000	do	Weaverton	do	do	N. Simmons.
12	Navy-yard	460,000	460,000	do	Laurel	Patuxent River	do	G. G. Davenport.
12	Steamer Fish Hawk	660,000	660,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
13	Navy-yard	260,000	260,000	do	Laurel	Patuxent River	Chesapeake Bay	G. G. Davenport.
13	Steamer Fish Hawk	1,660,000	1,660,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
14	Potomac barges	250,000	250,000	do	Point of Rocks	Potomac River	Chesapeake Bay	N. Simmons.
14	do	175,000	175,000	do	Relay House	Patuxent River	do	G. G. Davenport.
14	Steamer Fish Hawk	830,000	830,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
15	Navy-yard	300,000	300,000	do	Laurel	Patuxent River	Chesapeake Bay	N. Simmons.
15	Steamer Fish Hawk	508,000	508,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
16	Harre de Grace	4,101,000	4,101,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
16	Steamer Fish Hawk	979,000	979,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
17	Harre de Grace	568,000	568,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
18	Steamer Fish Hawk	498,000	498,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
18	Harre de Grace	100,000	100,000	do	Battery Island	Susquehanna River	Chesapeake Bay	F. N. Clark.
19	Steamer Fish Hawk	166,000	166,000	do	Harre de Grace	North East River	Susquehanna River	Z. L. Tanner.
20	Navy-yard	150,000	150,000	do	Laurel	Patuxent River	Chesapeake Bay	C. W. Schuermann.
21	Harre de Grace	260,000	260,000	do	Battery Island	Susquehanna River	do	F. N. Clark.
21	Potomac barges	1,000,000	1,000,000	do	Denton	Choptank River	do	T. B. Ferguson.

TABLE IX.—Geographical record of distribution of young shad, &c.—Continued.

Date.	Where fish were hatched.	Number of fish—		Introduction of fish.				Transfer in charge of—
		Started with.	Actually planted.	State.	Town or place.	Stream.	Tributary of—	
May 23	Steamer Fish Hawk ..	325,000	325,000	Maryland	Harre de Grace ..	North East River ...	Susquehanna River ..	Z. L. Tanner.
24	do	313,000	313,000	do	do	do	do	Do.
25	do	275,000	275,000	do	do	do	do	Do.
26	do	406,000	406,000	do	do	do	do	Do.
26	Harre de Grace	48,000	48,000	do	Battery Island	Susquehanna River ..	Chesapeake Bay	F. N. Clark.
27	do	330,000	330,000	do	do	do	do	Do.
27	Navy-yard	500,000	500,000	do	Laurel	Patuxent River	do	G. H. H. Moore.
27	Steamer Fish Hawk ..	1,250,000	1,250,000	do	Harre de Grace ..	North East River ..	Susquehanna River ..	Z. L. Tanner.
28	Harre de Grace	365,000	365,000	do	Battery Island	Susquehanna River ..	Chesapeake Bay	F. N. Clark.
28	Fort Washington	1,905,000	1,905,000	do	Fort Washington ..	Potomac River	do	M. McDonald.
28	Steamer Fish Hawk ..	500,000	500,000	do	Harre de Grace ..	North East River ..	Susquehanna River ..	Z. L. Tanner.
29	Harre de Grace	825,000	825,000	do	Battery Island	Susquehanna River ..	Chesapeake Bay	F. N. Clark.
30	do	400,000	400,000	do	do	do	do	Do.
30	Steamer Fish Hawk ..	1,000,000	1,000,000	do	Harre de Grace ..	North East River ..	Susquehanna River ..	Z. L. Tanner.
30	Fort Washington	1,096,000	1,096,000	do	Fort Washington ..	Potomac River	Chesapeake Bay	M. McDonald.
June 1	Harre de Grace	500,000	500,000	do	Battery Island	Susquehanna River ..	do	F. N. Clark.
2	Navy-yard	150,000	150,000	do	Laurel	Patuxent River	do	W. H. Jenkins, jr.
2	Steamer Fish Hawk ..	625,500	625,500	do	Harre de Grace ..	North East River ..	Susquehanna River ..	Z. L. Tanner.
4	Navy-yard	120,000	120,000	do	Weaverton	Potomac River	Chesapeake Bay	F. L. Donnelly.
7	Harre de Grace	100,000	100,000	do	Battery Island	Susquehanna River ..	do	F. N. Clark.
9	do	90,000	90,000	do	do	do	do	Do.
April 12-30	Avoca	3,029,500	3,029,500	North Carolina ..	Avoca	Salmon Creek	Albemarle Sound	S. G. Worth.*
29	do	498,000	498,000	do	do	do	do	Z. L. Tanner.
30	do	830,000	830,000	do	do	do	do	Do.
May 19	Navy-yard	220,000	170,000	Ohio	Defiance	Mannece River	Lake Erie	H. E. Quinn.
27	Potomac barges	1,000,000	850,000	do	Steuenville	Ohio River	Mississippi River ..	N. Simmons.
17	Harre de Grace	1,000,000	1,000,000	Pennsylvania ..	Sunbury	Susquehanna River ..	Chesapeake Bay	J. P. Creveling.
26	do	1,000,000	1,000,000	do	Mifflin	Juniata River	Susquehanna River ..	Do.
30	do	1,500,000	1,500,000	do	Newport	do	do	Do.
June 3	do	500,000	500,000	Rhode Island ..	Warren	Palmer's River	Narragansett Bay ..	H. E. Quinn.
May 17	Navy-yard	200,000	200,000	South Carolina ..	Charlotte	Catawba River	Wateree River	C. W. Schuermann.
June 1	do	220,000	220,000	do	Railroad Crossing ..	Pedee River	Atlantic Ocean	H. E. Quinn.
8	do	200,000	200,000	do	Columbia	Congaree River	Santee River	C. J. Huske.
20	do	200,000	200,000	Tennessee	Johnsonville ..	Tennessee River ..	Ohio River	N. Simmons.
24	do	60,000	60,000	do	Union Depot	Holston River	Tennessee River ..	C. A. Stuart.
24	do	70,000	70,000	do	Fullen's	Nolachucky River ..	do	Do.
24	do	70,000	70,000	do	Carler's Depot	Wantaga River	do	John Horan.
14	do	150,000	135,000	Texas	Railroad Crossing ..	Sabine River	Gulf of Mexico	G. G. Davenport.
15	do	58,000	58,000	do	Austin	Colorado River	do	G. H. H. Moore.
15	do	32,000	30,000	do	Railroad Crossing ..	San Marcus River ..	do	G. G. Davenport.

April	15	do	28,000	28,000	do	do	Brazos River	do	Do.
	15	do	32,000	30,000	do	do	San Antonio River	do	Do.
May	20	Potomac barges	1,383,000	1,383,000	Virginia	Gunston	Potomac River	Chesapeake Bay	M. McDonald.
	2	do	625,000	625,000	do	do	do	do	Do.
	5	do	1,510,000	1,510,000	do	do	do	do	Do.
	6	do	1,130,000	1,130,000	do	do	do	do	Do.
	7	do	220,000	220,000	do	do	do	do	Do.
	9	do	2,687,000	2,687,000	do	do	do	do	Do.
	10	do	1,634,000	1,634,000	do	do	do	do	Do.
	11	do	1,730,000	1,730,000	do	do	do	do	Do.
	12	do	2,571,000	2,571,000	do	do	do	do	Do.
	13	do	40,000	40,000	do	do	do	do	Do.
	16	do	2,585,000	2,585,000	do	do	do	do	Do.
	20	do	1,125,000	1,125,000	do	do	do	do	Do.
	24	do	5,490,000	5,490,000	do	do	do	do	Do.
	26	do	140,000	140,000	do	do	do	do	Do.
	31	do	1,000,000	1,000,000	do	Lynchburg	James River	do	J. F. Ellis.
	15	do	175,000	175,000	West Virginia	Wheeling	Ohio River	Mississippi River	Do.
			67,353,000	67,003,000					

* For waters in which planted see note at close of Table VIII.