

IX.—REPORT ON THE PROPAGATION OF PENOBSCOT SALMON IN 1885-'86.

BY CHARLES G. ATKINS.

Operations at the Penobscot Station were conducted, as in previous years, without change of importance in methods or apparatus. The only addition to the fixtures requiring mention was the construction of a new spawn house at Dead Brook, and some improvements of the stream and banks in front of it.

The purchase of breeding salmon was begun June 1, and brought to a conclusion June 20. Between these dates salmon were received on fifteen days. The aggregate number purchased was 691, of which 81 perished in transit, from excessive heat of the river water. The remaining 610 were all placed in the inclosure at Dead Brook, where they suffered during the summer a further loss of 93. At the spawning season there were recovered 501, leaving 16 not accounted for; most of these probably died and escaped detection. The net result of the purchase of 691 salmon was therefore 72 per cent of those purchased, and 82 per cent of those placed alive in the inclosures. The corresponding percentages in 1884 were 69 and 75, showing a slight improvement. The cause of the deaths that occur in the inclosure is not yet ascertained. As usual, they occurred soon after the first fish were inclosed, very few dying after the first month.

The size of Penobscot salmon this year was small. The estimated average of those purchased for the station was 12.95 pounds. At the spawning season 283 females and 196 males were weighed and measured. The females averaged 12.75 pounds in weight before spawning, and 31.06 inches in length. The males averaged 10 pounds in weight and 31.2 inches in length. The females yielded an average of 3.19 pounds of eggs, equal to 8,667 in number.

The spawning of the salmon was accomplished at the usual date, beginning October 27 and closing November 5. After manipulation all the salmon (except 19, that were captured after the rest had been liberated) were towed down to the village of Orland and liberated in tide-water

below the Orland dam. This has been practiced for several years. The total number of eggs obtained was estimated at 2,422,600; but from the data obtained by the count of rejected eggs and the measurement of the net stock the original number is computed to have been 2,454,058. These were placed without noteworthy incident in the hatchery at Craig's Brook.

The losses from lack of impregnation were greater than usual at this station, though by no means very large. They aggregated 113,371, or 4.6 per cent of the original number. There were 24,687 rejected for imperfections of another character. The total loss was thus 138,058, which reduced the available stock of eggs to 2,316,000, of which 1,000 were reserved for experimentation, and 2,315,000 shipped to the order of the contributors to the fund.

A *pro rata* division gave to the U. S. Commission, 1,254,000; to the Maine commission, 663,500; to the Massachusetts commission, 397,500. The actual division was as follows: to the U. S. Commission, 1,251,500; to the Maine commission, 663,500; to the Massachusetts commission, 400,000.

The transfer of the eggs was accomplished between January 4 and March 5, with exceedingly small loss, as shown in detail in the tabular statement below:

TABLE I.—Transfer of Penobscot salmon eggs from Orland, Me., during January, February and March, 1886.

Date.	Consignee.	Number of eggs—				Condition on unpacking.	Dead on unpacking.
		Belonging to Maine.	Belonging to Massachusetts.	Belonging to United States.	Total.		
1886. Jan. 5	U. S. Fish Commission, Cold Spring Harbor, New York.	.....	.....	240,000	240,000	Best ever saw.	04
6	do.	.....	.....	260,000	260,000	Good.....	04
26	E. B. Hodge, Plymouth, N. H.	.....	300,000	.....	300,000	do.....	30
27	do.	.....	80,000	.....	80,000	do.....	10
27	David Masterman, Weld, Me.	200,000	.....	.....	200,000	do.....	39
Feb. 3	Frank Gibbs, Bridgton, Me.	100,000	.....	.....	100,000	do.....	12
3	E. B. Hodge, Plymouth, N. H.	.....	20,000	*200,000	220,000	Very good.....	23
10	do.	.....	.....	*100,000	100,000	.....	.....
10	A. J. Darling, Enfield, Me.	160,000	.....	.....	160,000	Good.....	60
16	Charles G. Atkins, Grand Lake Stream, Maine.	200,000	.....	.....	200,000	do.....	(†)
26	A. J. Darling, Enfield, Me.	3,500	.....	316,500	320,000	do.....	109
Mar. 4	do.	.....	.....	135,000	135,000	do.....	35
		663,500	400,000	1,251,500	2,315,000		

* 150,000 eggs were donated to Vermont, and 150,000 to New Hampshire; all sent to Plymouth to hatch.

† Very few.

TABLE II.—Record of weather and temperature at Craig's Brook, 1885-'86.

Date.	Temperature.		Direction of wind.	Remarks.
	Brook.	Aque-duct.		
1885.	o	o		
Oct. 26	.....	.....	WNW	Clear and warm.
27	54	53	SW	Do.
28	54	53	Southerly.	Pleasant.
29	54	53	SE	Cloudy; followed by rain.
30	54	53	NE	Heavy rain.
31	47	46	NW	Cloudy; strong wind.
Mean ..	51.8	51.6		
Nov. 1	45	44	Westerly.	Clear; air cold, changing to warm.
2	47	46	E	Rain and strong wind.
3	47	46	W	Pleasant.
4	46	45	WNW	Cloudy, with strong wind.
5	49	48	SE	Cloudy; some rain; warm.
6	49	48	SE	Cloudy.
7	40	48	NE	Cloudy; followed by rain.
8	50	49	SE	Rain.
9	49	48	SE	Do.
10	48	47	WNW	Clear and cold, with strong wind.
11	47	46	WNW	Clear and windy.
12	47	46	S	Rain; warm.
13	47	46	S	Cloudy; not cold.
14	49	48	NNW	Cloudy and rainy.
15	.....	.....	.....	Clear and pleasant.
16	.....	45	W	Clear and windy.
17	46	45	WNW	Do.
18	.....	45	S	Cloudy and warm.
19	47	46	NE	Cloudy; followed by rain.
20	.....	45	W	Clear and warm.
21	.....	42	SW	Do.
22	.....	.....	.....	Clear.
23	43	42	S	Do.
24	.....	42	S	Clear and warm.
25	.....	42	NE	Windy, cloudy, threatening.
26	.....	42	NE	Cloudy, windy; a little snow.
27	.....	50	W	Clear.
28	.....	30	Westerly.	Clear, pleasant.
29	.....	.....	SW	Clear; lake frozen over for first time.
30	.....	38	Easterly..	Clear and warm.
Mean ..	46.8	44.7		
Dec. 1	.....	38	NE	Cloudy and very cold.
2	.....	38	W	Clear; not very cold; a man crossed the lake on the ice.
3	40	38	NE	Cloudy; snow.
4	.....	37	WNW	Clear; pleasant.
5	.....	30	E	Cloudy; heavy rain.
6	.....	.....	W	Clear; not very cold.
7	.....	37	ENE	Cloudy; snow.
8	.....	35	W	Clear and cold.
9	.....	36	E	Snow, followed by rain.
10	.....	38	S	Cloudy and rain; snow all gone.
11	.....	38	WNW	Clear and windy; ice in lake gone.
12	.....	36	WNW	Clear and windy; boat crossed the lake.
13	.....	.....	SW	Cloudy; rain.
14	.....	36	S	Rain; cloudy.
15	.....	36	NW	Clear and windy; little ice on lake.
16	.....	34	W	Clear and cold.
17	.....	33	NE	Clear, followed by cloudy weather; lake frozen over.
18	.....	34	NE	Snow.
19	.....	35	E	Snow and rain.
20	.....	.....	W	Clear and cold; good sleighing.
21	.....	34	.....	Clear and cold; a man crossed the lake on the ice.
22	.....	33	W	Clear and cold.
23	.....	34	SE	Pleasant.
24	.....	36	W	Clear and warm.
25	.....	33	NW	Clear and cold; good skating.
26	.....	33	N	Cloudy and cold.
27	.....	.....	NE	Cloudy and windy, with snow.
28	.....	33	W	Clear and cold.
29	.....	34	W	Clear and windy; first town crossed the lake; ice 8 inches thick.
30	.....	35	W	Clear and warm.
31	.....	35	SE	Cloudy and threatening.
Mean ..	.....	34.1		

TABLE II.—Record of weather and temperature at Craig's Brook, 1885-'86—Continued.

Date.	Temperature.		Direction of wind.	Remarks.
	Brook.	Aque-duct.		
1886.				
Jan. 1	o	35	SE	Cloudy and rain; snow all gone.
2		35	NE	Cloudy.
3				
4	39	37	SE	Do.
5		37	SE	Showers.
6		37	SW	Warm and pleasant.
7		35	NW	A rough day.
8		34	NW	Cold.
9		34	NE	Snow, with very strong wind.
10			NW	Cold.
11		34	W	Air, -10°: snow 4 inches deep.
12		34	WNW	Clear; air, -15°, and low all day.
13		34	W	Clear; air, -23° at 8.30 a. m.
14		34	W	Cloudy; not very cold.
15		34	W	Cloudy and moderate.
16			W	Clear and pleasant.
17		34		Clear.
18		34	WNW	Do.
19		34	N	Cloudy; snow and rain.
20		34	W	Snow, followed by clear weather.
21		35	E	Snow.
22		35	NE	Do.
23		35	W	Clear.
24				Clear; air -15°.
25		34		Do.
26		35		Clear and warm.
27		35		Cloudy and warm.
28		35		Hail storm.
29		35		Hail storms; trees loaded with ice.
30		35		Clear.
Mean ..		34.4		
Feb. 1		33	W	Clear and cold.
2		34		
3		34		
4		34		
5		34		
6		34		
7		35		
8		35		
9		35		
10		34		
11		35		
12		36		
13		36	SE	A great freshet.
14		36	W	
15		36	W	
16		36	NW	
17		36	W	
18		36	SW	Clear and warm.
19		36	S	Cloudy and warm.
20		36	W	Cloudy.
21		35	W	
22		35	W	
23		35	SW	
24		35	W	
25		35	W	
26		34	SE	
27		34	NW	
28		34	NW	
Mean ..		34.9		

BUCKSPORT, ME., August 20, 1886.