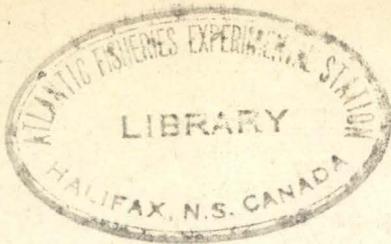


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**F I S H E R I E S R E S E A R C H B O A R D
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Title

**Investigations on the oysters and hydrography of the Shediac
area in the summer of 1932.**

Author

A. W. H. Needler.

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A.W.H.Needler.

Introduction.

In 1931 the jurisdiction over the oyster grounds in the Shediac area, Westmoreland county, New Brunswick, was placed in the hands of the Dominion government which undertook to foster the development of the oyster industry. As a necessary preliminary step in this project the Biological Board was requested to investigate the area from the point of view of its possibilities for oyster culture.

The services of Mr. J.W.Fisher, as a volunteer investigator, were obtained and he conducted, during the summer of 1932, an investigation of the hydrography of the area, its influence on the distribution and on the reproduction of the oysters, under the direction of the writer. Owing to reasons of health Mr. Fisher was unable to report fully on his work. The data is brought together here in as complete a form as possible but as the investigation is not yet brought to a conclusion the more simple and obvious compilations only are attempted.

The data was gathered along three chief lines, -1/ the hydrography of the area, 2/ the distribution and nature of the oysters, and 3/ their reproduction.

Hydrography.

In the following tables the data on the hydrography at the stations where regular observations were made, are given.

Table I. Hydrographic observations at the Farewell Buoy,
two miles north-east of Point du Chene.

Date.	Time.	Tide.	Depth.	Temp.	Sp.Gr. at T.		Salinity.
Jun 18	2.15P	L	Surf.	18.0	1.0198	22.5 22.4	27.4
			Bot.18'	14.6	1.0202	22.9	28.0
30	11.00A	3/4F	Surf.	16.9	1.0208	20.3	28.0
			Bot.15'	16.1	1.0214	20.2	28.8
Jul 7	11.00A	H	Surf.	16.2	1.0203	21.8	27.9
			Bot.16'	15.7	1.0212	21.2	28.8
13	11.00A	3/4F	Surf.	17.0	1.0217	18.8	28.8
			Bot.15'	16.0	1.0215	18.8	28.8 28.5
22	2.10P	H	Surf.	18.2	1.0215	20.5	29.1
			Bot.17'	17.7	1.0216	20.5	29.2
29	11.20A	3/4F	Surf.	20.3	1.0204	24.7	28.9
			Bot.13'	17.2	1.0205	24.8	29.1
Aug 6	10.55A	3/4R	Surf.	20.8	1.0202	25.2	28.7
			Bot.17'	17.0	1.0202	25.2	28.7
27	4.30P	3/4R	Surf.	22.0	1.0218	19.8	29.2
			Bot.17'	21.8	1.0219	19.6	29.3
Sep 1	4.30P	HR HF	Surf.	22.0	1.0214	21.2	29.1
			Bot.18'	22.0	1.0212	21.3	28.8
9	3.25P	3/4R	Surf.	20.0	1.0219	17.4	28.7
			Bot.17'	19.0	1.0220	17.0	28.7

Table II. Hydrographic observations off Point du Chene wharf.

Date.	Time.	Tide.	Depth.	Temp.	Sp.Gr. at T.		Salinity.
Jun 10	11.15A	L	Surf.	11.3	1.0215	21.1	29.2
			Bot.16'	11.3	1.0215	20.8	29.1
18	3.05P	HR 3/4F	Surf.	18.5 v21.0	1.0181 1.0181	22.9	25.3
			Bot.14'	18.5	1.0202	21.9	27.7
30	11.00A	3/4F	Surf.	17.0	1.0208	20.2	28.0
			Bot.18'	16.3	1.0210	20.2	28.3
Jul 7	11.30A	H	Surf.	16.1	1.0200	19.9	26.8
			Bot.21'	15.4	1.0213	19.8	28.5
15	10.20A	1/3F	Surf.	18.0	1.0219	19.0	29.1
			Bot.13'	17.0	1.0217	19.0	28.8
22	1.45P	3/4R	Surf.	19.5	1.0214	20.5	28.9
			Bot.18'	17.8	1.0215	20.4	29.0

Table II. Continued.

Date.	Time.	Tide.	Depth.	Temp.	Sp.Gr. at	T.	Salinity.
Jul 29	11.40A	3/4F	Surf.	22.0	1.0208	23.5	29.1
			Bot. 16'	20.8	1.0199	24.3	28.1
Aug. 6	11.15A	3/4R	Surf.	21.0	1.0200	25.6	28.8
			Bot. 18'	19.2	1.0200	25.8	28.8
27	5.00P	3/4R	Surf.	21.8	1.0222	19.6	29.7
			Bot. 16'	21.0	1.0213	19.9	28.5
Sep. 1	4.15P	HF	Surf.	23.0	1.0213	21.3	28.9
			Bot. 19'	23.4	1.0213	21.8	29.2
9	3.10P	3/4R	Surf.	21.2	1.0225	17.9	29.3
			Bot. 18'	19.4	1.0223	17.0	29.1

Table III. Water temperatures at end of Shediac wharf.

Date.	Time.	Surf. Temp.	Bot. Temp.	Depth.	Tide.
Jul 10	8.05A	17.9	16.6	9'	1/4 F 1/4 F.
	5.10P	19.5	18.2		
11	7.30A	17.2	17.8	8'	1/8 F
	5.30P	18.5	18.9	9'	H
12	8.00A	17.2	17.1	8'	1/8 F
	6.45P	18.8	18.6	9'	H
13	7.40A	17.5	17.7	8'	1/8 F
	6.10P	19.7	19.0		
14	7.35A	18.4	18.3	9'	H
	?	19.3	18.8		
15	7.10A	18.2 18.0	17.4		
	6.45P	19.5	18.2	9'	3/4R
16	7.30A	18.9 18.8	16.9	10'	H
	6.50P	21.2	18.8	9'	1/2 R.
17	8.30A	18.2	17.3	10'	H
	5.30P	20.0	16.7	7'	L
18	7.30A	17.5 18.8	18.8 17.5	11'	H
	6.45P	18.8	17.8	8'	L
19	7.30A	17.8	17.4	11'	H
	5.30P	20.5	18.4	8'	L
20	7.30A	17.8	17.3	10'	7/8 R
	5.30P	19.8	17.6	7'	L

Table III. Continued.

<u>Date.</u>	<u>Time.</u>	<u>Surf. Temp.</u>	<u>Bot. Temp.</u>	<u>Depth.</u>	<u>Tide.</u>
Jul 21	7.30A	18.2	17.8	7'	L
	6.30P	19.0	18.6	7'	L
22	8.10A	19.4	18.4	9'	1/8 F.
	6.15P	21.5	19.0	8'	3/4 F.
23	7.40A	19.4 19.5	18.1	8'	L
	5.50P	19.6	20.5	9'	3/4 F.
24	8.30A	19.0	18.8	9'	3/4 F.
	5.20P	19.8	18.5	10'	1/8 F.
25	7.30A	18.8	18.8	8'	1/8 F.
	7.00P	18.9	20.5	9'	3/4 F.
26	7.10A	18.9 19.1	18.3	9'	1/8 R.
	6.40P	21.6	19.8	8'	3/4 F.
27	8.15A	19.3	19.2 18.4	8'	3/4 F.
	5.00P	19.3 20.6	19.5	9'	1/8 F.
28	8.30A	20.0	18.4	8'	1/8 F.
	7.00P	22.0	20.4	10'	H.
29	8.40A	20.1	18.0	10'	1/4 F.
	7.20 P	22.1	18.5	9'	3/4 R.
30	7.30A	20.2	18.6	10'	1/4 F.
	5.30P	21.9	19.8	9'	1/8 R.
31	8.40A	19.3	19.0	10'	H
Aug. 1	7.30A	19.7	19.0	11'	H
	5.30P	22.2	19.5	9'	3/4 R.
2	7.30A	19.3	19.0	11'	H.
	5.50P	21.3	21.21	8'	L.
3	8.10A	20.3	19.8	10'	H.
	6.45P	22.3	21.0	8'	L.
4	8.40A	21.0	19.7	9'	1/8 R.
	5.50P	19.8	21.0	8'	L.
5	7.50A	19.8	19.2	9'	3/4 R.
	5.30P	22.2	20.0	8'	L.
6	8:00A	20.1	19.5	8'	1/4 R.
	5.30P	22.0	20.5	9'	3/4 F.
7	8.05A	20.5	19.6	8'	L.
	5.30P	21.0	20.8	9'	1/4 R.

Table III. Continued.

Date.	Time.	Surf. Temp.	Bot. Temp.	Depth.	Tide.
Aug 8	7.30A	18.0	18.4	8'	L.
	5.15P	19.4	20.0	9'	$\frac{1}{2}$ R.
9	7.50A	18.6	18.2	8'	$\frac{3}{4}$ F.
	5.30P	20.8	19.7	8'	$\frac{1}{4}$ R.
10	8.30A	16.5	17.0	10'	$\frac{3}{4}$ F.
	5.20P.	21.0	19.9	10'	H.
11.	7.50A	18.7	18.5	9'	$\frac{1}{2}$ F.
	5.50P	20.8	20.0	11'	$\frac{1}{3}$ F.
12	8.05A	19.3	19.0	8'	$\frac{3}{4}$ F.
	5.35A	21.3	19.6	10'	$\frac{1}{4}$ F.
13	7.30A	19.8	19.4	11'	H.
	5.30P	21.2	20.0	9'	$\frac{1}{2}$ R.
14	7.30A	19.6	19.0	11'	H.
	5.30P	22.2	20.1	9'	$\frac{1}{4}$ R.
15	7.30A	19.8	19.2	10'	$\frac{3}{4}$ R.
	5.10P	24.6	19.8	8'	L.
16	8.05A	19.6	19.4	10'	$\frac{3}{4}$ R.
	7.30P	21.8	20.3	8'	$\frac{1}{4}$ R.
17	9.20A	20.8	20.4	9'	$\frac{1}{2}$ R.
	7.00P	24.0	21.4	11'	H.
18	8.30A	20.2	20.1?	8'	$\frac{1}{4}$ R.
	5.30P	21.8	22.0	7'	L.
19	8.30A	20.9	20.7	9'	$\frac{1}{2}$ R.
	5.30P	21.2	21.3	9'	$\frac{3}{4}$ F.
20	8.45A	21.2 21.2	21.0	7'	L.
	5.30P	22.2	21.7	10'	$\frac{3}{4}$ F.
21	8.30A	20.8	20.5	8'	L.
	5.45P	22.6	22.1	8'	$\frac{3}{4}$ F.
22	8.30A	20.7	21.0	7'	L.
	5.00P	22.2	21.5	9'	$\frac{1}{2}$ F.
23	8.20A	20.4	20.1	10'	$\frac{7}{8}$ F.
	6.00P	22.0	21.2	10'	$\frac{3}{4}$ F.
24	6:00A	20.0	19.9	9'	$\frac{1}{2}$ F.
	5.30P	22.0	21.4	10'	$\frac{1}{4}$ F.
25	9.00A	19.9	19.4	7'	L.
	7.00P	21.5	21.0	9'	$\frac{1}{2}$ F.

Table III. Continued.

Date.	Time.	Surf. Temp.	Bot. Temp.	Depth.	Tide.
Aug 26	8:00A	20.2	20.1	9 $\frac{1}{2}$ '	3/4 F.
	5:00P	22.9	21.8	8'	7/8 R.
27	8:05A	20.9	20.8	8'	$\frac{1}{2}$ F.
	5:00P	22.5	22.0	9'	3/4 R.
28	9:00A	21.1	21.0	9'	$\frac{1}{2}$ F.
	5:30P	22.0	21.8	9'	$\frac{1}{2}$ R.
29	8:00A	20.2	19.8	11'	H.
	5:30P	21.4	21.3	9'	$\frac{1}{2}$ R.
30	8:30A	20.2	20.0	11'	H.
	5:30P	20.0	20.6	8'	1/4 R.
31	8:30A	19.8	19.8	10'	H.
	5:30P	22.0	21.8	7'	L.
Sep 1	8:30A	21.1	20.5	9'	3/4 R.
	5:00P	21.0	21.3	7'	L.
2	6:30A	21.0	20.9	10'	$\frac{1}{2}$ R.
	5:30P	20.8	20.9	8'	L.
3	8:00A	20.0	20.5	8'	1/4 R.
	5:30P	22.0 23.2	22.0	10'	7/8 F.
4	7:50A	20.9	20.7	7'	L.
	6:40P	21.8	21.8	7 $\frac{1}{2}$ '	L.
5	8:30A	20.0	20.8	8'	2/8 R.
	5:30P	22.2	22.0	9'	$\frac{1}{2}$ F.
6	8:30A	20.9	20.7	7'	L.
	5:30P	22.0	21.8	9 $\frac{1}{2}$ '	$\frac{1}{2}$ F.
7	8:30A	19.2	19.4	10'	7/8 F.
	5:30P	21.0	20.8	11'	H.
8	8:20A	18.0	18.4	10'	3/4 F.
	5:15P	19.4	20.	12'	H.
9	7:50A	17.2	17.5	10'	$\frac{1}{2}$ F.
	5:45P	18.0	18.5	11'	7/8 R.
10	8:05A	16.5	17.0	12'	H.

Table IV. Hydrographic observations at end of Shediac wharf.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at	Tem.	Salinity.
#Jun 20	9.10A	LF	Surf.	15.4	1.0212	17.8	27.9
			Bot.7'	14.9	1.0212	18.0	27.9
	6.35P	L	Surf.	18.1	1.0208	21.3	28.3
			Bot.4'	18.2			
#Jun 21	8.05A	H	Surf.	18.0	1.0192	21.4	26.3
			Bot.7'	17.5	1.0210	21.3	28.5
#Jun 21	2.30P	LR	Surf.	20.2	1.0194	21.2	26.5
			Bot.5'	21.4	1.0217	21.2	29.5
#Jun 29	7.35P	H	Surf.	18.7	1.0207	21.1	28.1
			Bot.8'	17.7	1.0209	21.2	28.4
#Jun 21	11.50A	H	Surf.	18.4	1.0206	20.9	28.0
			Bot.8'	19.3	1.0210	20.9	28.5
#Jun 21	7.20P	L	Surf.	17.5	1.0208	20.9	28.3
			Bot.5'	16.8	1.0209	20.9	28.4
#Jul 1	8.20A	H	Surf.	16.8	1.0209	19.7	28.0
			Bot.8'	16.5	1.0209	19.8	28.0
#Jul 1	7.35P	H	Surf.	18.1	1.0207	21.8	28.4
			Bot.7'	17.9	1.0208	22.0	28.5

On these dates observations made at "Foot of Caulder St. at end of wharf."

~~Jul 29 8.20A H~~

Jul 9	8.30A	L	Surf.	17.5	1.0200	22.0	27.5
			Bot.6'	17.4	1.0207	22.0	28.4
	5.30P	1/4 F	Surf.	18.2	1.0202	22.0	27.7
			Bot.9'	18.0	1.0205	22.0	28.1
11	7.30A	1/2 F	Surf.	17.2	1.0210	22.0	28.8
			Bot.8'	17.2	1.0210	22.1	28.8
	5.45P	H	Surf.	18.25	1.0199	22.0	27.4
			Bot.	18.9	1.0212	22.0	29.1
13	7.30A	1/4 F	Surf.	17.5	1.0209	18.8	27.7
			Bot. 9'	17.7	1.0217	18.6	28.7
	7.00P	LF	Surf.	19.7	1.0212	18.9	28.1
			Bot.10'	19.0	1.0214	18.6	28.3
16	7.30A	H	Surf.	18.8	1.0212	18.9	28.1
			Bot.10'	16.9	1.0216	19.1	28.7
	6.40P	1/2 R	Surf.	21.2	1.0190	20.7	25.8
			Bot.9'	18.8	1.0214	20.8	28.9

Table IV. Continued.

Date.	Time.	Tide.	Depth.	Temp.	Sp.Gr. at	T.	Salinity.
Jul 18	7.20A	L	Surf.	18.8	1.0218	20.8	29.5
			Bot.11'	17.3	1.0222	20.7	30.0
	6.45P	L	Surf.	18.8	1.0212	20.7	28.7
			Bot.8'	17.8	1.0210	20.8	28.4
20	7.30A	LR	Surf.	17.8	1.0215	19.2	28.7
			Bot.10'	17.3	1.0217	19.3	28.9
	5.30P	L	Surf.	19.8	1.0222	19.4	29.6
			Bot.7'	17.6	1.0219	19.8	29.3
22	8.10A	H	Surf.	19.4			
			Bot.10'	18.4	1.0220	20.6	29.7
	6.10P	3/4 F	Surf.	21.5	1.0212	20.6	28.7
			Bot.8'	19.3	1.0220	20.6	29.7
25	7.00A	3/4 F	Surf.	18.8	1.0191	24.5	27.2
			Bot.9'	18.8	1.0202	24.5 24.5	28.5
	7.00P	3/4 F	Surf.	20.5	1.0200	24.5	28.4
			Bot.9'	18.9	1.0201	24.5	28.5
27	8.15A	3/4 F	Surf.	19.3	1.0200	24.0	28.1
			Bot.8'	18.4	1.0203	24.2	28.7
	5.00P	1/2 F	Surf.	20.6	1.0198	24.2	28.0
			Bot.9'	19.5	1.0194	24.3	27.5
29	8.40A	1/4 F	Surf.	20.1	1.0198	20.5	26.7
			Bot.10'	18.0	1.0197	20.7	26.7
	7.20P	3/4 R	Surf.	22.1	1.0205	21.0	27.9
			Bot.9'	18.5	1.0198 203	21.2	27.6
31	8.40A	H	Surf.	19.3	1.0205	21.8	28.1
			Bot.10'	19.1	1.0208	21.9	28.5
	5.30P	1/4 R.	Surf.	22.3	1.0190	21.9	26.2
			Bot.8'	18.6	1.0205	21.9	28.1
Aug 2	7.50A	H	Surf.	19.3	1.0210	19.0	27.9
			Bot.11'	19.0	1.0210	19.0	27.9
	5.50P	L	Surf.	21.3	1.0210	19.0	27.9
			Bot.8'	21.1	1.0210	19.0	27.9
4	8.40A	3/4 R.	Surf.	21.0	1.0212	19.0	28.1
			Bot.10'	19.7	1.0218	19.0	28.9
	5.30P	L	Surf.	21.0	1.0210	18.5	27.7
			Bot.9'	19.5	1.0215	18.5	28.4
6	8.00A	1/4 R.	Surf.	20.1	1.0201	25.4	28.3
			Bot.8'	19.5	1.0200	25.6	28.8

Table V. Hydrographic observations, Harrington bed, Shediac bay.

<u>Date.</u>	<u>Time.</u>	<u>Tide.</u>	<u>Depth.</u>	<u>Temp.</u>	<u>Sp.Gr. at T.</u>		<u>Salinity.</u>
Jun 10	8.40A	L	Surf.	11.9	1.0210	20.9	28.4 28.5
			Bot. 8'	11.9	1.0212	20.8	28.7
18	9.20A	H	Surf.	17.5	1.0195	23.2	27.2
			Bot. 8'	16.8	1.0192	25.2	27.6
30	3.05P	L	Surf.	17.4	1.0210	21.0	28.5
			Bot. 7'	17.2	1.0210	20.9	28.5
Jul 7	10.15A	H	Surf.	23.6	1.0212	19.7	28.4
			Bot. 10'	23.4	1.0210	19.8	28.1
15	9.50A	1/2 F.	Surf.	18.6	1.0220	18.9	29.2
			Bot. 10'	18.4	1.0217	19.0	28.8
18	9.00A	H	Surf.	16.6			
			Bot. 12'	18.0			
20	9.30A	1/2 R.	Surf.	17.9			
			Bot. 11'	16.5			
23	8.35A	L	Surf.	20.0	1.0214	20.5	28.9
			Bot. 7'	18.9	1.0212	21.0	28.8
25	8.35A	3/4 F	Surf.	20.0			
			Bot. 9'	19.2			
27	4.30P	3/4 R	Surf.	20.1			
			Bot. 7'	19.6			
29	10.45A	1/2 F	Surf.	21.3	1.0203	24.8	28.8
			Bot. 10'	19.5	1.0200	24.7	28.4
Aug 3	11.40A	H	Surf.	21.0			
			Bot. 10'	20.0			
6	10.20A	3/4 R.	Surf.	21.1	1.0198	25.2	28.4
			Bot. 10'	20.1	1.0198	25.8	28.5
27	4.00P	1/2 R.	Surf.	22.2	1.0219	19.8	29.3
			Bot. 10'	22.7	1.0215	19.8	28.8
Sep 1	3.45P	3/4 F.	Surf.	22.7	1.0216	21.0	29.3
			Bot.	22.2	1.0214	21.8	29.3
9	5.00P	H	Surf.	19.6	1.0219	17.0	28.5
			Bot. 9'	19.4	1.0220	17.1	28.7

Table VI. Hydrographic observations, Poiréer bed, Shediac bay.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.	Salinity.	
Jun 18	9.55A	H	Surf.	18.2	1.01955	22.8	27.1
			Bot.5'	17.8	1.0193	23.0	27.0
30	10.10A	1/2 F.	Surf.	18.0	1.0205	20.4	27.6
			Bot.3'	18.0	1.0208	20.4	28.0
Jul 7	9.40A	H	Surf.	20.2	1.0108	19.7	14.7 14.6
			Bot.5'	20.0	1.0109	19.7	14.7
15	9.20A	1/4 F.	Surf.	18.5	1.0218	19.0	28.9
			Bot.5'	18.0	1.0219	18.9	29.1
18	10030A	H	Surf.	18.5			
			Bot.5'	18.0			
20	10.00A	1/2 R.	Surf.	18.0			
			Bot.13'	17.5			
23	9.30A	LR	Surf.	20.0	1.0228	20.2	30.6 ?
			Bot.7'	19.5	1.0222	20.9	28.9
25	9.30A	L	Surf.	20.5			
			Bot.5'	19.8			
27	3.50P	H	Surf.	21.0			
			Bot.8'	20.4			
29	10.00A	1/2 F.	Surf.	22.8	1.0198	24.8	28.1
			Bot.5'	20.6	1.0200	24.8	28.4
Aug 3	11.15A	H	Surf.	21.0			
			Bot.12'	21.4			
6	9.40A	1/2 R.	Surf.	21.2	1.0194	25.4	27.9
			Bot.5'	20.2	1.0189	25.4	27.2
27	3.50P	1/2 R.	Surf.	23.2	1.0219	19.6	29.3
			Bot.6'	23.2	1.0220	19.6	29.5
Sep 1	2.45p	3/4 F.	Surf.	23.1	1.0208	21.6	28.4
			Bot.5'	23.5	1.0212	21.2	28.8
9	4.45P	H	Surf.	20.2	1.0220	17.0	28.7
			Bot.6'	19.9	1.0220	17.0	28.7

Table VII. Hydrographic observations at lowest bridge over Shediac river.

<u>Date.</u>	<u>Time.</u>	<u>Tide.</u>	<u>Depth.</u>	<u>Temp.</u>	<u>Sp. Gr. at T.</u>	<u>Salinity.</u>	
May 31	11.13A	3/4 F.	Surf.	15.6	1.0130	17.5	17.0
			Bot.12'	12.6	1.0192	17.4	25.1
Jun 8	10.40A	3/4 R.	Surf.	11.5	1.0200	20.9	27.2 intere
			Bot.12'	12.8	1.0168	20.9	17.9 changed?
10	10.10A	L	Surf.	12.7	1.0160	21.0	21.8
			Bot.15'	12.5	1.0195	20.9	26.5
16	10.00A	1/2	Surf.	19.8	1.0159	22.0	22.1
			Bot.12'	18.6	1.0162	21.8	22.4
18	10.35A	1/2 F	Surf.	19.5	1.0159	22.2	22.1
			Bot.12'	18.4	1.0162	23.4	22.9
20 6.15P L Surf.							
28	9.30A	1/2 F.	Surf.	19.0	1.0172	20.9	23.4
			Bot.12'	18.0	1.0172	20.9	23.4
29	1.50P	LR	Surf.	23.2	1.0172	21.2	23.6
			Bot.4'	22.8	1.0180	21.6	24.7
30	9.45A	1/2 F	Surf.	20.2	1.0175	20.3	23.7
			Bot.12'	20.0	1.0192	20.4	25.0
Jul 7	8.35A	H	Surf.	18.1	1.0174	19.7	23.4
			Bot.16'	18.4	1.0206	19.7	27.6
15	8.20A	H	Surf.	20.0	1.0198	19.0	26.3
			Bot.15'	19.7	1.0203	19.0	27.0 27.0
16	4.30P	1/4 R.	Surf.	22.9	1.0148	20.8	20.5
			Bot.12'	19.5	1.0182	20.8	24.7
22	3.50P	LF	Surf.	22.0	1.0190	20.5	25.8 25.8
			Bot.12'	20.7	1.0203	20.8	27.5
25	10.30A	L	Surf.	21.8	1.0150	24.3	21.6
			Bot.13'	20.0	1.0172	24.8	24.7
27	2.45P	3/4 R.	Surf.	23.0			
			Bot.12'	22.4			
29	9.30A	1/2 F.	Surf.	23.2	1.0158	24.8	22.9
			Bot.10'	22.6	1.0160	24.8	23.2
30	2.15P	L	Surf.	22.0	1.0119	22.8	17.0
			Bot.20'	21.0	1.0182	22.9	25.4
Aug 3	10.45A	H	Surf.	21.8			
			Bot.15'	20.6			

Table VII. Continued.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.		Salinity.
Aug 6	8.40A	$\frac{3}{4}$ R.	Surf.	22.2	1.0183	26.0	26.7
			Bot.9'	20.4	1.0177	26.0	25.0
24	11.15A	L	Surf.	20.8	1.0162	23.5	23.0
			Bot.10'	21.0			
27	3.20P	$\frac{1}{2}$ R.	Surf.	23.6	1.0190	20.0	25.5
			Bot.11'	23.2	1.0188	19.8	25.3
Sep 1	2.30P	$\frac{3}{4}$ F.	Surf.	23.8	1.0192	21.3	26.2
			Bot.17'	23.0	1.0191	21.2	26.0
9	4.00P	$\frac{3}{4}$ R.	Surf.	21.0	1.0210	17.0	27.4
			Bot.12'	20.0	1.0215	17.0	28.0

Table VIII. Hydrographic observations at the middle ~~(Wooden)~~ bridge over the Shediac river.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.		Salinity.
Jun 8	10.40A	$\frac{3}{4}$ R.	Surf.	12.5	1.0104	20.9	14.5
			Bot.15'	12.0	1.0162	20.9	22.1
16	10.30A	$\frac{1}{2}$ F.	Surf.	21.0	1.0098	22.0	14.0
			Bot.12'	19.7	1.0122	22.0	17.1
28	9.45A	$\frac{1}{2}$ F.	Surf.	19.2	1.0199	21.0	27.1
			Bot.7'	18.3	1.0224	21.1	30.4
Jul 16	4.40P	$\frac{1}{4}$ R.	Surf.	23.5	1.0115	20.7	15.8
			Bot.7'	22.8	1.0119	20.8	16.5
30	2.30P	$\frac{1}{4}$ R.	Surf.	24.2	1.0060	22.4	9.1
			Bot.8'	23.0	1.0116	22.5	16.5
Aug 24	9.15A	L	Surf.	21.2	1.0125	23.8	18.2 18.2
			Bot.	21.4	1.0128	23.7	18.6
Sep 1	2.15P	$\frac{3}{4}$ F.	Surf.	25.0	1.0148	21.8	20.5
			Bot.17'	23.4	1.0176	21.8	24.3
9	3.40P	$\frac{3}{4}$ R.	Surf.	21.0	1.0191	17.0	24.9
			Bot.13'	20.8	1.0197	17.0	25.7

Table IX. Hydrographic observations at the uppermost bridge over the Shediac river.

Table IX. Hydrographic observations at the uppermost bridge
over the Shediac river.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.	Salinity.	
Jun 8	11.30A	3/4 R.	Surf.	11.20	1.0012	20.9	2.3
			Bot.4'	9.4	1.0022	20.9	3.6
16	10.50A	1/2 F.	Surf.	20.5	1.000.0	21.8	less than 1.8
			Bot.2'	19.8	1.0070	21.8	10.3
28	10.10A	1/2 F.	Surf.	18.5	1.0002	21.0	less than 1.8
			Bot.8'	18.8	1.0050	21.1	7.4
Jul 16	5.30P	1/4 R.	Surf.	25.5	1.0012	20.8	2.3
			Bot.6'	21.4	1.0117	20.8	16.2
30	3.00P	1/4 R.	Surf.	21.8	1.0001	21.8	less than 1.8
			Bot.7'	20.8	1.0003	21.9	less than 1.8

Table X. Hydrographic observations at the lowermost bridge
over the Schoudouc river at Shediac.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.	Salinity.	
Jun 14	11.15A	L	Surf.	17.0	1.0180	17.8	23.7
			Bot.5'	15.0	1.0189	17.9	24.9
20	8.45A	1/8 F.	Surf.	15.4	1.0198	17.1	25.8
			Bot.6'	15.3	1.0210	17.7	27.5
	6.15P	L	Surf.	20.0	1.0190	21.0	25.0
			Bot.3'	19.9	1.0189	21.4	25.0
21	11.15A	H	Surf.	18.8	1.0177	22.0	24.5
			Bot.7'	17.8	1.0203	22.3	28.0
	6.50P	L	Surf.	21.0	1.0184	20.9	25.1
			Bot.3'	18.4	1.0189	20.9	25.8
27	11.00A	L	Surf.	18.8	1.0143	20.8	19.6
			Bot.5'	16.8	1.0188	20.9	25.8
29	7.40A	H	Surf.	19.0	1.0127	21.4	17.6
			Bot.7'	18.1	1.0193	21.2	26.3
	7.10P	H	Surf.	18.4	1.0208	21.2	28.5 28.3
			Bot.11'	17.7	1.0208	21.3	28.4
Jul 1	7.45A	H	Surf.	17.4	1.0170	19.8	22.9
			Bot.8'	18.8	1.0202	20.0	27.1
	1.50P	L	Surf.	21.0	1.0182	21.8	25.1
			Bot.6'	22.8	1.0190	21.8	26.2

Table X. Continued.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.		Salinity.
Jul 4	10.45A	H	Surf.	18.0	1.0178	18.8	23.7
			Bot. 5'	19.4	1.0183	18.8	24.3
11	7.45A	½ F.	Surf.	18.2	1.0168	21.8	23.2
			Bot. 5'	17.7	1.0173	22.0	23.9
14	11.30A	¾ F.	Surf.	21.4			
			Bot. 6'	20.6			
19	11.35A	H	Surf.	19.8	1.0183	20.0	24.6
			Bot. 11'	19.2	1.0205	20.0	27.5
23	11.00A	¾ R.	Surf.	21.0	1.0167	20.4	22.6
			Bot. 7'	20.4	1.0191	20.8	25.0
26	10.00A	L.	Surf.	22.7	1.0175	24.8	25.1
			Bot. 5'	21.8	1.0182	24.6	26.0
Aug 1	3.00P	L.	Surf.	24.0	1.0188	23.9	26.6
			Bot. 7'	22.6	1.0187	24.0	26.5
26	11.00A	L.	Surf.	22.8	1.0188	22.1	25.0
			Bot. 11'	23.0	1.0189	22.0	26.0
Sep 3 2	10.30A	¾ R.	Surf.	21.8	1.0213	19.2	28.4
			Bot. 8'	21.9	1.0212	19.0	28.1
8 2	10.30A	L	Surf.	21.0	1.0199	19.9	26.6
			Bot. 5'	20.6	1.0200	19.0	26.6

Table XI. Hydrographic observations at the middle (iron) bridge over the Schoudouc river at Shediac.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.		Salinity.
Jun May 14	9.30A	½ F.	Surf.	—	1.0131	18.5	17.4
			Bot. 3'	16.4	1.0163	18.1	21.5
Jun 21	10.30A	H	Surf.	21.8	1.0091	22.2	13.2
			Bot. 7'	21.3	1.0197	22.2	27.2
27	10.20A	¾ F.	Surf.	18.3	1.0024	20.8	3.9
			Bot. 4'	17.8	1.0023	20.9	3.7
Jul 4	9.45A	H.	Surf.	19.5	1.0032	18.8	4.4
			Bot. 5'	19.0	1.0179	18.8	23.8
14	10.20A	½ F.	Surf.	22.2	1.0022	22.8	4.1
			Bot. 6'	19.9	1.0195	18.6	25.8
19	10.40A	H.	Surf.	22.0	1.0053	20.0	7.5
			Bot. 9'	18.3	1.0208	20.0	28.0

Table XI. Continued.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.	Salinity.	
Jul 26	9.00A	L.	Surf.	21.0	1.0018	24.8	4.3
			Bot. 21 4'	21.4	1.0186	24.8	26.6
Aug 1	2.00P	L.	Surf.	26.0	1.0030	23.8	5.6
			Bot. 4'	22.4	1.0179	23.9	26.7 25.4
26	10.20A		Surf.	22.2	1.0154	22.0	21.5
			Bot. 6'	22.5	1.0195	22.0	26.8
Sep 3	10.30A	3/4 R.	Surf.	22.2	1.0149	19.1	19.9
			Bot. 8'	21.8	1.0205	19.0	27.2
8	9.55A	L.	Surf.	21.4	1.0117	19.4	25.8
			Bot. 7'	22.8	1.0198	19.8	26.6

Table XII. Hydrographic observations at the uppermost (wooden) bridge over the Schoudous river at Shediac.

Date.	Time.	Tide.	Depth.	Temp.	Sp. Gr. at T.	Salinity.	
Jul 14	10.00A	1/2 F.	Surf.	22.0	1.0013	22.8	3.0
			Bot. 5'	19.7	1.0183	18.6	24.2
Jun 21 14	10.00A	3/4 F	Surf.	18.3	1.0021	18.5	3.0
			Bot. 5'	16.4	1.0174	18.5	23.0
21	9.50A	3/4 R	Surf.	21.0	1.0037	22.6	6.1
			Bot. 7'	19.5	1.0175	22.3	24.3
27	9.30A	3/4 F	Surf.	17.8	1.0002	21.1	Less than 1.8
			Bot. 5'	16.4	1.0162	21.0	22.2
Jul 4	9.05A	7/8 R	Surf.	19.0	1.0013	18.8	1.9
			Bot. 5'	20.1	1.0170	18.8	22.6
14	See above.						
19	9.30A	3/4 R	Surf.	18.8	1.0063	20.1	8.8
			Bot. 7'	19.0	1.0089	19.9	12.3
26	8.30A	3/4 F	Surf.	20.7	1.0008	24.8	2.8
			Bot. 4'	20.0	1.0173	24.8	24.9
Aug. 1	1.30P	H.	Surf.	24.2	1.0014	23.9	3.4
			Bot. 4'	22.3	1.0167	23.8	23.7
26	9.50A	L.	Surf.	21.5	1.0113	22.0	15.9
			Bot. 5'	23.5	1.0187	22.2	25.0
Sep 8	9.30 10.30A	L.	Surf.	21.0	1.0110	19.6	14.9
			Bot. 8'	21.9	1.0213	19.2	28.4
30	9.20A	1/2 R	Surf.	21.5	1.0193	19.2	25.8
			Bot. 4'	21.8	1.0050	19.0	6.9

To summarize briefly the hydrography of the area as shown by the above data:-

Salinities. At the farewell buoy outside the mouth of the bay salinities of 27.4 to over 29 per mille were found at the surface and 28 to over 29 per mille at the bottom, with, perhaps, a tendency to lower salinity early in the year. Off Point du Chene wharf, in the entrance to the bay, salinities of about 25 per mille to over 29 per mille at the surface and of 27.7 to over 29 per mille at the bottom were found. At Shediac wharf surface salinities ranged from about 26 to over 29 per mille and bottom salinities from about 27 to over 29 per mille (a maximum determination of 30 per mille); At the Harrington bed on the west side of the bay surface salinities were from about 27 to over 29 per mille, and bottom salinities from 27½ to over 29 per mille. At the Poirier bed, between Shediac ~~island~~ island and the mainland to the west, salinities were from 27 to over 29 per mille except for the ~~xx~~ samples of 14.6 (surf.) and 14.7 (bottom) on July 7th. In all these places the water was shallow, 13' to 18' at the Farewell buoy, 13' to 21' off Point du Chene, 4 to ¹¹~~14~~' at Shediac wharf, 7 to 12' on the Harrington bed and 3 to 7' on the Poirier bed. The salinities prevailing in the bay are indicated as being fairly high and sufficiently high to expect a fairly high quality of oyster where the ground is sufficiently hard. The salinities were taken over a limited period and the small size of the bay, its shallowness, and the presence of two tributary rivers lead us to expect them to be readily influenced by heavy precipitation which would cause a temporary freshening of the water. The exceptionally low salinities on the Poirier bed on July 7th (14.7 per mille) are ^{possibly} probably due

the inflow of much fresh water from the Shediac river but the salinities at the mouth of the latter show no corresponding drop and there is always the possibility of the influence of springs when the water is so shallow. The observations were probably not made at exactly the same place each time. However, in spite of isolated instances, it can be definitely stated that fairly high salinities prevailed in the bay in the summer of 1932.

In the two rivers, the Shediac and the Schoudouc, there was found, as expected, a decrease in salinities ~~toward~~ toward the head of tide. At the mouths the salinities are very variable especially at the surface. This is even more true farther up,

In the Shediac river the salinities near the mouth ~~xxx~~ were from $17\frac{1}{2}$ to $27\frac{1}{2}$ per mille at the surface and from $22\frac{1}{2}$ to 28 at the bottom in from 10 to 17 feet. In this vicinity oysters are abundant but of recognizably poorer quality than in the bay.

About two miles farther up, at about the upper limit of the oyster ^{of abundance} ~~(xxxxxx)~~, surface salinities varied from 4 to $27\frac{1}{2}$ per mille and bottom salinities from 21 to 22 . ~~Several~~ ^{About two} miles above, within a few hundred miles of the head of tide, the surface salinities were up to $2\frac{3}{4}$ per mille and the bottom salinities ~~xxxxxx~~ up to 16.

At the mouth of the Schoudouc river the surface salinities were from $17\frac{1}{2}$ to $28\frac{1}{2}$ per mille and the bottom salinities from 24 to $28\frac{1}{2}$. Further up, ~~xxxx~~ ^{but still} just below the upper limit of the oysters, the surface salinities were from 4 to $21\frac{1}{2}$ per mille and the bottom from ~~22~~ 21 to 23. At the uppermost bridge, well above the uppermost limit of the oysters, the surface salinities were from close to 0 to ~~19~~ 16 and the bottom salinities from 12 to 26.

It is pointed out that the salinities are so variable that the observations can serve only to give an indication of the prevalent conditions. The salinities which limit the distribution might occur at other seasons.

Temperatures. The very small depths prevailing throughout the area make the temperatures very variable and dependent on changes in the weather. Unfortunately daily temperature readings were not established until the beginning of July and, consequently, the observations give a rather incomplete picture of the temperature conditions.

It appears, however, that the bottom temperature reached and passed 20°C . at all the observation stations. These temperatures were not reached until August at the Farewell buoy and apparently not until the end of July in the entrance to the bay, off Point du Chene wharf. In the rest of the stations temperatures about 20°C were reached at the end of June or early in July, although with subsequent decreases.

It is worthy of note that there is no ^{great} apparent significant difference in the ^{prevailing} temperatures ~~throughout the~~ between the inner bay (Harrington and Poirier beds), the river mouths and the upper parts of the rivers.

In this area there is a much more pronounced salinity gradient from strait to head of tide than in Bideford river and a ~~much~~ less pronounced temperature gradient. It appears that the oysters are limited in their distribution up the rivers by low salinities (not approaching the head of tide as in Bideford river) and that they are not ~~consequently~~ subjected in the bay to much lower temperatures than in the rivers.

Distribution and nature of the oysters.

We have two chief sources of information on the distribution, size and shape of the oysters which are supplemented by miscellaneous explorations. In August experimental tong-lifts were made over the known producing areas and certain doubtful areas, in order to find out what areas were then capable of supporting a profitable commercial public fishery. In connection with the examination of oysters for spawning data were recorded on the sizes and shapes of the oysters at various places.

In making the experimental tong-lifts a stake was put down to make it possible to put the tings down again and again in almost exactly the same place. The tongs were put down next to the stake and a grab made. This was repeated until the area was cleaned of oysters - as shown by failure to obtain more. The tongs had heads 2½' long and were tied so that they would open only far enough for the tips of the teeth to be 2' apart. In this way it was possible for them to take oysters only from an area 2' X 2½'.

As there was nowhere in the area any "set" of spat in 2 1932 no spat were counted, all the oysters being a year old or more.

Shediae river. Figure 1 is a sketch of Shediae river showing where experimental tong-lifts were made. For two small beds below the lowest bridge reference should be made to figure 2. Between these beds and "Poirier" bed ~~there~~ ~~is~~ the nearest known producing bed there is a considerable intervening distance which makes it convenient to divide the producing areas into those in the Shediae river and those in the bay.

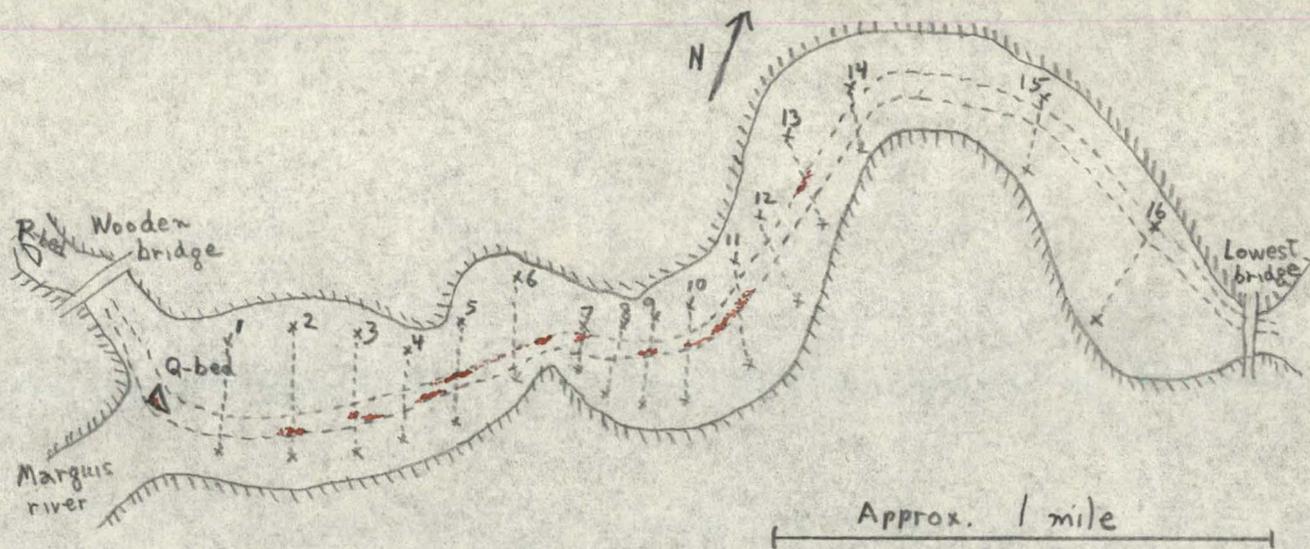


Fig. 1. Shediac river.

Showing the location of the areas examined for live oysters in Shediac river. The sections numbered 1 to 16 are referred to in the text. Sample areas were cleaned along each of these sections. There are also two beds which were examined - "R" above the wooden bridge, and "Q" a small triangular bed near the junction of the ~~shallow~~ shallow Marquis river branch with the main river. The sides of the deep channel are shown in dotted lines.

Copied from sketch by J.W. Fisher.

In Figure 1 the position of 16 cross-sections of the river and of two small beds are given. Tong-lifts were taken at intervals of about ten feet along the cross-sections and several were made on each of the beds. Oysters were found as follows:

"R" bed. Six tong-areas gave 6 oysters clustered together.

"Q" bed. Five tong-areas gave 4, 2, 7, 6 and 7 oysters - an average of just over 5. (5.2). The bed slopes into the channel on the south side.

Section 1. No oysters.

Section 2. 11 oysters in a tong-area on the south side of the channel. The bed is a narrow strip there.

Section 3. ³ 3 oysters in an area on the bottom of the channel.

Between Sections 3 and 4 3 oysters in three lifts along the south side of the channel.

Between sections 4 and 5 3 oysters in two lifts on south side.

Section 4. No oysters.

Section 5. 20 oysters in one tong-area on north side of channel

From section 5 to 6 lifts gave in order 3, 2, 1, 0, 1 and 3 oysters along the north side of the channel.

Section 6. A quarter of the way towards section 7 on the N. side of the channel 4 and 5 oysters resp. on two areas

Section 7. 3 oysters in a tong-area on North side of channel.

Section 8. No oysters recorded.

Section ~~9~~ ⁹ ~~9~~ ³ 3 oysters in a tong area on South side of channel.

two tong-areas on a spot 10 yds. W. of this gave 5 and 14 oysters.

Section 10. From 10 to 11 along the S. side of the channel ~~some~~ lifts gave in order 3, 4, 2, 4, 3 and 2 oysters.

Section 11. 4 oysters from a tong area on the S. side of the channel. Eastern end of the bed.

Section 12. No oysters recorded.

Section 13. # 3 oysters in a tong-area just W. of stake on N. side of the channel.

± Section 14. 4 oysters in a tong-area on the South side of the channel.

Sections 15 and 16. No oysters recorded.

~~Be~~

In figure 2 the position of bed "M" on the north side of the channel just below the bridge and of bed "N" on the south side of the channel slightly downstream are indicated.

Bed "M". Four tong-areas gave 6, 7, 3 and 2 oysters.

Bed "N". Six tong-areas along the middle of the bed parallel to the channel gave 3, 2, 0, 0, 2 and 0 oysters.

It is seen from the above data that in this stretch of the Shediac river from bed "R" above the second bridge to bed "N" below the lowest bridge, the oysters are confined to the channel and chiefly to the side of the channel. Even along the sides of the channel the distribution of the oysters is very irregular and there are evidently considerable areas practically barren. The highest concentration of oysters found was 20 ^{in a} ~~per~~ tong-area at section 5. Following this were cases where 14 and 11 oysters were found in a tong-area. The bulk of the areas examined which had any oysters had, however, only seven or less, and the average even on the small productive spots is only 3 or 4. Where the areas with oysters are so small and scattered it is very difficult to estimate the producing area and such averages mean little in estimating the possible yield of the whole area.

Explorations above bed "R" showed the presence of a very few oysters and one was found just below the uppermost bridge. To what extent the hydrography and the bottom play a part is problematical. The bottoms throughout the river are muddy except on the producing

areas where there is a tendency towards accumulations of shells on the bottom and on certain sandy areas. As there ~~xxx~~ ^{is} debris present in the upper parts of the area which might serve for the attachment of oysters larvae, and as there doubtless ~~xxx~~ ^{have} been similar quantities in the past, it seems a reasonable conclusion that the failure of beds to appear is due primarily to unfavourable hydrographic conditions rather than to bottom conditions. The bed "R" is the uppermost considerable accumulation of shells and the upper limit of abundance of oysters in all probability in the past as well as the present. Conditions (temperature and salinity) are so variable that it is to be expected that the oyster population in the upper parts of the river has been similarly variable but it is believed that bed "R" can be safely regarded close to as the usual limit of abundance.

Shediac bay. Figure 2 shows the position of the areas on which sample tong-lifts were made. The results are given below taking the areas in order of their position from North to South.

1. The Poirier bed. This is the largest bed in the bay and lies where Shediac island approaches most closely to the mainland. The deepest channel is close to the wharf of the island and it is possible to wade out onto the bed from the west at low tide. Ten tong-areas along the North edge from West to East had the following numbers of oysters, - 0, 20, 4, 0, 0, 0, 2, 0, 0, 0, Nine tong-areas from West to East further south had, - ¹0, 5, 7, 3, 4, 0, 6, 6, and 4. Ten areas along the middle of the bed from West to East had, - 0, 3, 3, 0, 0, 2, 0, 8, 7, 3. Nine tong areas from west to east farther south had, - 0, 0, 2, 13, 25, 11, 0, 2, 1. Ten tong-areas along the southern edge from west to east had, - 12,

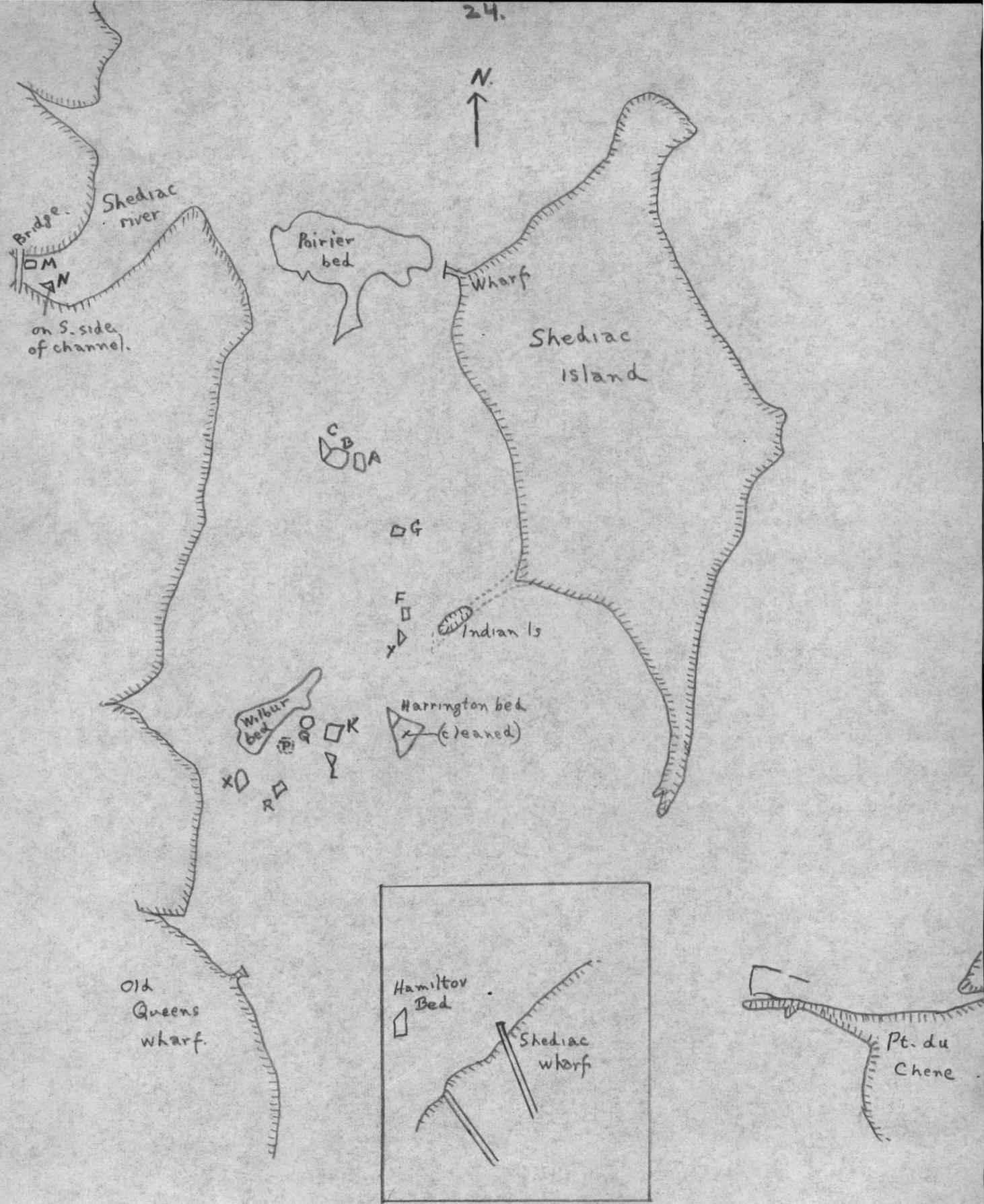


Fig. 2. Sketch of main live oyster beds in Shedrac bay - August, 1932.

7, 2, 2, 0, 0, 8, 8, 4, 0. In 48 tong-areas 195 oysters were taken - an average of 4.1 per tong-area - and the number per tong-area varied from 0 to 25. The distribution of the oysters was ~~is~~ not even but was very irregular 19 of the tong-areas having no oysters and over a third of the oysters being taken in five of the tong-areas.

2. Bed "C". Beds "A", "B" and "C" lie close to ~~one another~~ one another south of the Poirier bed and might perhaps be regarded as parts of a single bed. All three are small. Six tong-areas on "C" had 22, 20, 18, 6, 11, and 10 oysters - an average of 14½ per tong-area.

3. Bed "B". Eight tong-areas on "B" had 80, 70, 36, 21, 0, 6, 18, and 22 - and average of 39 per tong-area.

4. Bed "A". Five tong-areas on "A" had 22, 21, 18, 19, and 4 - an average of 17 per tong-area.

5. Bed "G" - a small bed north of Indian island. Six tong areas had 14, 1, 20, 7, 4, 22, an average of 11 per tong area.

6. Bed "F" - a small bed off the point of Indian island. Nine tong-areas had 2, 6, 2, 7, 4, 0, 0, 3 and 4 - and average of 2 2/3 per tong-area.

7. Bed "Y" - a small bed just south of "F". Five tong areas had 5, 11, 7, 3, and 2 - an average of ^{5½}~~4~~ per tong area.

8. ~~Bed~~ Wilbur bed. Ten tong-areas from west to east along the north edge had 0, 6, 1, 0, 3, 1, 1, 4, 0, and 6. Ten areas from west to east farther south had 13, 1, 32, 2, 1, 1, 1, 2, 4, and 7. Ten tong-areas from west to east farther south had 4, 2, 2, 0, 3, 3, 12, 0, 5, 1. Ten tong-areas along the southern edge had 13, 11, 8, 0, 0, 0, 0, 3, 6, and 1. Ten tong-areas scattered over the whole bed had 0, 2, 5, 3, 0, 2, 0, 0, 1, and 7. Fifty areas yielded an average of 3 2/3 per tong area.

9. Beds "P" and "Q" two small beds near the "Wilbur" bed yielded 3 oysters in 17 tong-areas.

10. Bed "K". Eight tong-areas had 2, 1, 4, 0, 0, 3, 2, and 3 - an average of 2 per tong-area.

11. Bed "L". Six tong-areas had ~~six~~ 0, 1, 4, 0, 0, 1. An average of 1 per tong-area.

12. Bed "X". Eight tong-areas had 10, 5, 7, 10, 2, 3, 5, and 7 - an average of 6 per tong-area.

13. Bed "R". Nine tong-areas had 2, 6, 6, 6, 16, 24, 4, 2, and 12 - an average of $8 \frac{2}{3}$ per tong area.

14. ~~Hamilton~~ Harrington bed, uncleaned NW corner. Six tong-areas had 0, 1, 0, 4, 0 and 1 - an average of 1 per tong area.

15. Hamilton bed, near Shediac wharf. ~~xx~~ Nine tong-areas had 27, 0, 6, 6, 22, 0, 13, 19, and 21 - an average of 13 per tong-area.

The above beds include all those on which oysters were known to be present in any considerable quantities at the time of the exploration (August, 1932). Occasional oysters are to be expected around the entire shore of the bay and, according to local report, are sometimes found outside Shediac island and Point du Chene. Other beds now barren and silted over to varying depths are present in the southern part of the bay and nearer to the entrance to the bay than those recorded above, indicating that at some early date oysters were abundant on these more exposed areas. Their disappearance there and continued presence in the more sheltered waters is in agreement with the history of other areas which have been subjected to severe public fishing. In the colder and saltier waters the ~~low~~ quality and ~~emand~~ ^d are better and the ~~rate of~~ reproduction poorer and ~~more variable~~. less

certain.

It is evident from the results of the exploration that the oyster population is concentrated in the region between Shediac island and the mainland from the Poirier to the vicinity of the Wilbur and Harrington beds. The two large beds - the Wilbur and Poirier - had an average of about 4 oysters per tong-area. Some of the smaller beds in the vicinity had a lower concentration due possibly to more silt among other factors. Some of the smaller beds had, on the other hand, a much higher concentration - especially the "A", "B" and "C" beds. It is believed that the knowledge of the fishermen ~~plays~~ plays an important part in these cases as it was found that very few fishermen knew of the existence of these small good fishing grounds whereas ~~everyone~~ everyone knew of the large beds. Those "in the know" apparently often practice deliberate deception to prevent the general public from discovering the good spots and depleting them.

The ~~Harrington~~ Hamilton bed is a considerable distance from the others and is much nearer the mouth of the Schoudouc river which supports many oysters.

Schoudouc river. This is a smaller river than the Shediac and its mouth is right in the town of Shediac. Oysters were found at the mouth but not in very large quantities. It is known, however, that poaching is common here and very difficult to control owing to the proximity of the fishing population. Oysters are present on stones etc. along the shores to the second bridge about a mile above the ~~town~~ town and a very few are to be found right up to within two or three hundred yards of the head of tide in the neighborhood of the third bridge. Oysters are found in the channel in considerable numbers just above the

second bridge - more than 2 per tong- area being taken.

Size of oysters. Lengths of oysters were measured inside the shell from where the nacre ends at the hinge to its limits at the edge of the shell. Widths were measured in the same way at the widest part. Most of these measurements were made in July when the oysters were being examined for spawning. ~~The detailed data are given in~~ Table XIII gives the lengths of oysters measured.

Table XIII. Lengths of oysters in the Shediac area July 15 to August 6, 1932.

Size (cm).	Poirier bed.	Shediac river Upper Lower.	Harrington bed.	Bed "F"	50yds. SW Indian I.	Schoud. R. U.	L.	
0-5	1	1	2	7	4	10	0	3
5.1-6	27	10	9	28	4	3	1	9
6.1-7	32	22	17	26	1	0	2	10
7.1-8	29	15	29	13	0	0	3	12
8.1-9	2	7	11	8	0	0	5	4
9.1-10	3	5	8	0	0	0	5	3
10.1-11	2	0	0	2	0	0	3	3
11.1-12	1	1	0	1	0	0	1	2
12.1-13	0	0	0	2	0	0	1	0

The most striking feature of the lengths as shown above is the very small proportion of small oysters except on the bar to the southwest of Indian island and on bed "F". Even the small ones in these localities were most of them close to 5 cm. long. This means that in the whole area there ~~are~~ ^{were} very few oysters less than two inches in length (internal measurement) or less than 2½ inches long in the ordinary outside measurement. It suggests that there was a very poor "set" of spat in 1931 as well as in 1932.

The percentage of marketable size in the samples was estimated from the internal measurements to be as follows:

Poirier bed	33%	Harrington bed	30%
Upper Shediac R.	33%	Lower Shediac R.	42%
Schoudouc R.		Schoudouc river	
Lower bridge	31%	W 2nd. bridge	71%

It is pointed out, however, that ~~all~~ the measurements were made in advance of the principal growing season. It has been found in Bideford river that little growth occurs previous to spawning and less during spawning, most of the year's growth occurring in August and September. It would be expected, then, that the smaller oysters would grow on the average nearly an inch before the fishing season opened in October. There being very few less than 2 $\frac{1}{2}$ inches long (outside) in July we would expect few less than 3 $\frac{1}{2}$ inches long in October. This means that the percentage of marketable size would be great ~~everywhere~~ - possibly over ninety per cent on most of the grounds. This would lead to the removal of a high proportion of the stock during the public fishing.

Regarding the beds not mentioned above Mr. Fisher wrote on Sept. 16, 1932, shortly after making the experimental tong-lifts over the known beds, - "The size of the oysters on the Wilbur, X, R and K beds ^{are} ~~is~~ similar to ~~that~~ those on the Harrington. The Wilbur bed oysters are for the most part the largest in the bay. Those on the Hamilton bed are almost all marketable. The size of those on C, B, A and G beds is similar to that of the ones on the Poirier bed." This extends the probability of most of the oysters being marketable in the fishing season of 1932 to the remaining producing beds.

Shape of the oysters. The relation of internal length to internal width in the oysters measured is summarized in table XIV.

Table XIV. Shape of oysters in the Shediac area.

<u>Locality</u>	<u>Number.</u>	<u>Lgt./Wdth</u>
Shediac river between lowest and second bridges,	61	1.75
Shediac river below lowest bridge.	76	1.55
Poirier bed.	97	1.44
Harrington bed.	87	1.36
50 yards SW of Indian island.	13	1.42
Bed "F".	9	1.27
Schoudouc river, just below lowest bridge.	45	1.85
Schoudouc river, near second bridge.	21	2.25

It will be seen in Table XIV that the oysters in the bay were rounder than the oysters in the rivers, and that in each river the oysters farther up were longer. Bottom conditions as well as salinity ~~play a part~~ influence the shape. ~~As far as the bay is concerned~~ ~~in~~. Those on the hard shell beds in the bay are under bottom conditions more conducive of "roundness" than the river oysters.

It was also regularly observed that the bay oysters were more "cupped" and had thicker shells than the river oysters, and that in the rivers those farthest up had the least "cupped" and thinnest shells. This is, of course, in agreement with common experience in other oyster areas.

Spawning of the oysters.

The spawning of the oysters was observed in a number of places and the results are given below, in Table XV.

Table XV. Spawning of oysters in the Shediac area in 1933.

Date and Locality.	Number Estimated to have spawned:-							
	None.	Slightly	1/4.	1/2.	3/4.	Nearly all	All.	
Upper Shediac R.	4	4	2	0	0	0	1	
July 7.	0	1	1	3	0	1	3	
July 22:	0	0	1	2	0	6	3	
July 26:27.	0	0	0	2	0	8	2	
July 29.	0	0	0	0	0	5	4	
Aug. 6.	1	2	1	1	2	9	0	
Shediac R., 1st bridge.	4	5	0	0	0	0	0	
July 7.	3	0	5	2	0	0	2	
July 15.	0	3	2 ³	0	0	0	2	
July 22.	0	4	3	1	0	2	2	
July 25.	0	0	1	2	1	5	3	
July 27.	0	0	0	2	3	6	0	
July 29.	0	0	0	1	3	6	0	
Aug. 3.	0	0	0	0	2	4	5	
Aug. 6.	4	4	2	0	0	0	1	
Poirier bed.	7	4	0	0	0	2	0	
July 7.	5	0	4	0	0	2	0	
July 15.	4	3	4	1	0	0	0	
July 18.	0	5	4	2	2	0	0	
July 20.	0	2	0	0	3	3	2	
July 23.	0	2	0	4	2	1	1	
July 25.	0	0	2	0	3	5	0	
July 27.	0	0	0	0	3	4	3	
July 29.	0	0	0	2	4	0	3	
Aug. 3.	0	0	0	0	3	4	3	
Aug. 6.	0	0	0	2	4	0	3	
Harrington bed.	Most	Few	None					
July 7.	3	4	3	2	0	0	0	
July 18.	1	5	3	0	0	1	0	
July 20.	2	3	4	1	0	0	0	
July 25:23.	2	3	4	3	0	0	0	
July 25	0	5	2	2	0	0	0	
July 27.	0	5	1	2	1	1	0	
July 29:	0	0	3	0	5	3	0	
Aug. 3.	0	0	0	3	4	2	2	
Aug. 6.	8	0	2	0	0	0	0	
Schoudouc R., 1st. bridge.	1	7	0	1	1	2	1	
July 14:	0	0	7	0	0	0	3	
July 19.	0	0	3	2	3	2	0	
July 23.	0	0	2	0	2	5	3	
July 26.	0	0	2	0	2	5	3	
Aug. 1st.	8	0	2	1	0	0	0	
Schoudouc R., 2nd. bridge.	0	0	0	1	2	3	4	
July 14.	0	0	0	0	2	2	7	
July 19:	0	0	0	0	2	2		
July 26.	0	0	0	0	2	2		
Aug.								

Table XV is based on estimations of the amount of spawn ~~present in the oysters~~ present in the oysters examined - whether they were "full" or partly full of spawn. This is, of course, only roughly indicative of the proportion of its spawn which has been released by the oyster. But the observations serve to indicate that spawning occurred in all the localities and that nowhere was spawning well advanced before July 7th., ~~was~~ or less than half over by the first week of August. The observations do not show any striking differences in the spawning time at the several localities but it is suggested that spawning was latest on the Harrington bed (fairly deep water in the bay) and earliest in upper stations in the Shediac and Schoudouc rivers. These differences may be correlated with slight temperature differences.

Spat production. Wire bags of oyster and quahaug shells were placed along the shores just below low-tide level at ^{in some of which} representative places ~~where~~ spat was known to have been naturally produced in abundance. The time of spawning was estimated from the data in Table XV and from temperature data and ~~was~~ the bags placed in the water two weeks after the estimated spurts. The places and dates were as follows: /

Bar off Indian island (spat naturally produced in abundance in former years). July 13 ~~(6 bags)~~ ~~(12 bags)~~ (12 bags), Aug. 3rd. (91 bags).

Poirier bed. July 13 (6 bags),

Shediac river, near lower bridge, July 12th. (6 bags); above lower bridge, July 12th (12 bags), July 27th. (50 bags).

Schoudouc river just below first bridge, July 14 (6 bags); near 2nd. bridge, July 14th (6 bags).

Schoudouc river near 2nd. bridge, July 14 (6 bags).

Near Point du Chene wharf, July 13th. (6 bags).

At none of these places was a single spat obtained. The bags became dirty with silt and algae but not abnormally so. The variety of times and places and the entirely complete absence of spat suggests that it was due to the failure of larvae to reach the setting stage rather than their failure to find suitable cultch. Independent intensive search by Mr. Fisher and myself for naturally produced spat failed to find a single specimen although the search was made in some places where 1931 spat was present and where spat was known to have been abundant in former years.

It appears, then, that the oysters spawned but that at some stage between spawning and "setting" there was an extremely high mortality. We have no evidence as to the cause of the mortality. The salinities and temperatures do not offer an explanation by themselves being well within the range favourable to larval development and not varying as much as the larvae can withstand without damage. ~~ignores~~ A great number of factors could be suggested, as possibly palying a part.

Summary.

Hydrography.

1. The hydrographic data ^{are} ~~is~~ presented in detail.
2. Temperatures at the bottom passed 20°C at all the stations -at the end of June or early in July in the bay and rivers and in August at the "Farewell buoy" off the entrance.
3. Bottom salinities of 27 to 29 per mille prevailed in the bay, with surface salinities somewhat lower and more variable. Salinities decreased sharply in the rivers becoming very variable

and falling very low some distance below the head of tide.

4. In this area there is a much more pronounced salinity gradient from strait to head of tide than in Bideford river and apparently a less pronounced temperature gradient due to warmer water outside and the very small depths in the bay. The small depths make the diurnal temperature variations important.

Distribution of the oysters.

5. Experimental tonging showed three centres of abundance - in order of importance, between Shediac island and the mainland to the west, the lower part of Shediac river and the lower part of the Schoudouc river. In the two former concentrations of commercial importance are present.

6. Occasional oysters are present around the entire bay and barren silted beds are present towards the mouth showing the usual depletion accompanying severe public fishing. In the rivers the abundance decreases towards the heads and is limited apparently by salinity.

7. Measurements made in July showed a high proportion of oysters of marketable size (commonly 30 to 40%) and most of the remainder of sizes that would be expected to reach marketable size by October. The sizes indicate that 1931 was a year of poor reproduction.

8. Oysters in the bay proper were well cupped and "round" becoming longer and narrower going up the rivers.

Spawning and spatting.

9. Oysters spawned wherever present the chief spawning

being from the end of June to the first week in August,
slightly later in the deep ^{er} water of the bay than in the
upper parts of the rivers.

10. No spat was collected on bags of shells put out
at various times and places, and no naturally produced spat
could be found.
