

APR 10 1943



MANUSCRIPT REPORTS OF THE BIOLOGICAL STATIONS

No. 1576

see index

PROSPECTS FOR THE DEVELOPMENT OF THE OYSTER INDUSTRY
IN CARAQUET BAY

by

A. W. H. Needler



**FISHERIES RESEARCH BOARD
OF CANADA**

MANUSCRIPT REPORTS OF THE BIOLOGICAL STATIONS

No. 156

Title

PROSPECTS FOR THE DEVELOPMENT OF THE OYSTER INDUSTRY
IN CARAQUET BAY

Author

A. W. H. Needler

1936

153

PROSPECTS FOR THE DEVELOPMENT OF THE OYSTER INDUSTRY
IN CARAQUET BAY

A. W. H. Heedlér

Being urged by local interests to take steps towards the improvement of the oyster industry in Caraquet bay the Department of Fisheries in May of this year requested that the writer visit the area at some time during the season and report on the possibilities for development. The visit was made early in September in company with Supervisor A. L. Barry. A visit had also been made in July, 1932, in connection with a proposed application for a lease for oyster farming.

It must be borne in mind that, as time allowed, a visit of only one day, no more than a preliminary survey was possible, serving to indicate the possibilities but not to provide any complete basis for development.

TUPOUNAWAY. Caraquet bay is on the south side of the Baie de Chaleur near the mouth. It is at the northern limit of the oyster's range, being the northernmost oyster-producing area of any consequence on the Atlantic coast.

The bay is shown on the accompanying chart. Only the inner bay - i.e. west of Maissonette point - is of direct interest as the oysters are found principally at the western end as indicated on the chart.

The bay is well sheltered. Although it has a wide mouth towards the east a shallow sand bar extends south-east from Maissonette point and the deep channel (about 25 feet at low tide) enters along the other side.

From the bar to the head of the bay is about five miles. The bay is about two miles wide just inside the bar and narrower towards the head. The area of the inner bay below low water might be roughly estimated at from 3,000 to 4,000 acres.

The bay is fairly shallow. Water deeper than two fathoms at low tide is limited to the lower part of the bay along the south side where the channel enters. Much of the area is less than a fathom deep and gently shelving shores and fairly wide flats are the rule.

Two brooks, of which the southern is the larger, enter at the head of the bay. The inflow of fresh water is not very great as the drainage area is little over 100 square miles.

Little can be learned of the temperature conditions in an area without continuous observations over a considerable period. As the Caraquet oyster population is self-supporting it may be presumed that the temperature at the head of the bay passes 68°F sufficiently far and often for reasonably good spawning. On the other hand the oysters, as noted below, seem to have a relatively slow growth and late settling of spat - confirming the expectation of relatively low prevailing temperatures.

Such limited observations of salinity as have been possible do not indicate very salty water. On September 11th of this year bottom salinities in the vicinity of the oyster grounds at the head of the bay were from about 2.5‰ to about 2.7‰, and even in the channel south from Maissonette point they did not reach 2.8‰. On July 7th and 8th, 1932, the salinities were apparently lower still, being less than 2.3‰ on the oyster grounds. The latter observations had, however, been preceded by rainy weather. Without further observations in the Caraquet bay itself and further knowledge of the surface salinities outside in the southern part of the Baie de Chaleur (which may vary seasonally a great deal) it is impossible to make a reliable estimate of the salinities from season to season; but the data available indicate only reasonably high salinities on the Caraquet oyster areas.

The hydrographic observations are given below for record.

			<u>Temp. (C)</u>	<u>Salinity ‰</u>
1932				
July 7	4:00 PM.	Off Rousseau Pt. ("A")		
		Tide 2, rising	Sur. 18.8	2.30
	8 3:00 PM.	Seaward edge of fishing area		
		Tide L, rising. NE gale	Sur. 19.5	1.63
	8:00 PM.	Bridge over R. du Sud.		
		Tide high	Sur.	1.24
1936				
Sept. 11	10:45 AM	Channel in mouth of		
		R. du Sud. ("B")	Sur. 17.1	2.47
		Tide near H, rising	Bo. 9' ----	2.47
	4:50 PM	Tide near L, falling	Sur. 17.3	2.29
			Bot. 12' ----	2.63
		Off Rousseau Pt. ("A") on chart)		
	11:35 AM	Tide near H, rising	Sur. 16.3	2.63
			Bot. 10' ----	2.71
	5:10 PM	Tide near L, falling	Sur. 16.7	2.67
			Bot. 8' ----	2.71
		Channel south of Maissonette		
		Pt. ("C")		
	12:00 M	Tide near H.	Sur. 15.8	2.76
			Bot. 15' ---	2.77

Oyster population and fishery. Caraquet bay has long been known as the source of oysters of good quality.

It is reported locally that formerly larger quantities of oysters were taken than at the present time. Reliable parties state that about 35 years ago the yield was in the vicinity of 1,000 barrels and this is confirmed by the following figures taken from Department of Fisheries reports:- 1895, 1200 bbl.; 1896, 1250 bbl.; 1899, 1,000 bbl.; 1900, 1050 bbl.; 1901, 400 bbl.; 1905, 800 bbl.; 1906, 850 bbl.; 1907, 900 bbl.; 1908, 800 bbl.; 1909, 600 bbl. More reliable figures since 1921 are as follows:

1921	515 bbl.	1926	370 bbl.	1932	440 bbl.
1922	500 bbl.	1927	365 bbl.	1933	487 bbl.
1923	475 bbl.	1928	665 bbl.	1934	253 bbl.
1924	595 bbl.	1929	510 bbl.		
1925	640 bbl.	1930	435 bbl.		

These figures show that the catch has varied from year to year but that there has been a decline to less than half of the level of 40 years ago. Possibly even higher yields were obtained before that.

While the annual variations are probably due to variations in the success of reproduction (in turn probably influenced by the hydrographic conditions), the general decline can only be regarded as due to the failure of the natural reproduction to support the fishery. The fishery has been intensive because the oyster-producing area is limited, the population large and the demand good.

The present fishery is limited to the head of the bay, being principally west of a line from the "Oyster point" to the "Rousseau point" on the chart. The oysters are stated to be more abundant in the western and north-western part of even this limited area.

GROUNDING. The oysters are obtained principally on flat sandy or sandy-mud bottoms. Some are picked at low tide and the rest obtained with rakes out to a depth of five feet at low tide. Some thin or mud oysters are obtained in the river channels but the great majority of the oysters are of the good shape which would be expected from the nature of the ground.

It is, of course, impossible to estimate at all accurately the area of suitable ground. But when it is remembered that an acre of good ground can produce 100 barrels of high quality oysters and much higher quantities of the lower qualities, it is obvious that the production is only a small fraction of what the ground could support and that sufficient ground is available for a much enlarged industry.

REPRODUCTION. The oysters examined had grown slowly and the markings on the shell indicated that a relatively small size was reached at the end of the first season - i.e. the season during which they settled as spat. This indicates a late spawning season due probably to relatively poor warming of the water. Slow growth and late spawning are indicated.

On the other hand, the fishery shows only normal variations from year to year - much smaller, for example, than at Shediac where the production of spat is known to be unreliable. This suggests that the reproduction is fairly reliable and, while limited, might be improved by the application of the proper methods of spat collection. In an inlet with a small inflow of fresh water the conditions may be expected to be more constant from year to year than in one which has large tributary rivers.

While shells are present on some of the grounds the reproduction may be limited to quite an extent by lack of suitable materials for spat to settle on. The collection of spat and planting of small oysters might bring into much better use grounds which are sandy or muddy and have little of such materials.

On a reef at "D" on the chart (locally known as Pt. des Roches) an abundance of small oysters were observed. They were believed to be principally one year old with a few two-year-olds or older. Exposed at low tide, a very high mortality is to be expected if the oysters are left in place. The occurrence of small oysters on such reefs is a common phenomenon and one which offers an opportunity of assisting the natural production. The reef bore enough small oysters to produce probably two or three hundred barrels if removed, separated, planted on deeper, firm bottom, and protected from starfish. Such oyster-bearing reefs are of little or no value unless the oysters are removed and planted. They commonly occur, as in this case, towards the open and on exposed points. While the "set" on such reefs varies from year to year they represent a considerably potential source of "seed" oysters if properly used.

It is believed that these reefs owe their productivity, among other factors, to the presence of suitable materials for spat to settle on kept clean by wave action. The occurrence of such a reef is an encouraging matter, but its exploitation means the planting of oysters when still small and numerous - not the fishing of market oysters from the reef itself.

General Discussion. From the above we may draw the following conclusions:

(1) Caraquet bay is not now producing to nearly its full capacity. The yield is only a fraction of what the ground might support.

(2) The fishery has declined to less than half its former size. This may be attributed to a fishery too intensive for the natural reproduction. There is no reason to expect a natural recovery of the yield other than temporary variations from year to year about the present level, and further decline is possible.

(3) While the growth is slow, this is associated with high quality.

(4) While the spawning is apparently late and the natural reproduction limited, it is probably normally reliable. The natural production may be limited to a large extent by the

absence of suitable materials for the settling of spat, which is common on sandy or muddy grounds of the type prevalent in the bay. The application of suitable spat collection methods and the planting of small oysters could probably increase the production considerably.

(5) The exploitation of natural production of small oysters on reefs by separation, planting on deeper firm bottoms and protection from starfish would also increase the production to a degree depending on the productivity of the reefs from year to year - a matter hard to predict.

These are, of course, tentative conclusions which should be confirmed by more thorough investigation over a longer period. There is, however, reason to believe that the production could be increased by the application of oyster cultural methods with, as usual, some adaptation to local conditions. There is also the possibility, which is, however, doubtful without further investigation, of obtaining "seed" stock for planting from other neighbouring areas where reproduction is good but quality inferior.

Granted that further investigations would probably evolve oyster cultural methods suitable to the area, the problem of the application of such knowledge remains. It has been the universal experience that the development by governments of areas for public fishing is costly and not satisfactory. The expenditure of considerable sums may increase the production but increases in the fishing keep pace and the control necessary for the best results is an expensive and very difficult matter. Great expense to the public at large is incurred without correspondingly valuable lasting results. The better alternative - and in fact the only satisfactory one - lies in the control by individuals or groups of the grounds which they themselves develop so that those who do the work reap the benefit.

In this matter it has been the policy of the Department not to interfere with the public fishery and to favour leasing only on those grounds not supporting a public fishery. Some suitable ground for planting oysters in this category is believed to be present in Caraquet Bay and its development would, I believe, be to the general public benefit. This might be carried on by individuals or possibly by groups of those interested in the fishery, such as might be developed by the adult education work now being carried on under the Department's auspices. In the present instance, of course, the leasing of oyster grounds is under the control of the Province.

Eilerslie, P.E.I.,
November, 1936.

