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# PRELIMINARY PROPOSALS FOR AN OYSTER CULTURE POLICY IN CAPE BRETON

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# PROPOSALS FOR AN OYSTER CULTURE POLICY IN CAPE BRETON

A. W. H. Needler.

In the week commencing October 19th, 1936, the writer, at the request of the Department of Fisheries, visited oyster areas of the Bras d'Or Lakes in company with Doctor M. Cumming (representing the Nova Scotia government) and Chief Supervisor D. H. Sutherland. The principal purpose of the visit was to formulate proposals for an oyster culture policy in this region, especially in regard to the leasing of ground for oyster farming and the conditions under which this would be in the public interest. With the assistance of the local Inspectors of Fisheries, Messrs. P. W. Smith and J.O'Toole, a general survey of the situation was made and many of those interested in the industry, whether through public fishing or the development of leased areas, were interviewed.

Doctor Cumming accompanied the writer on a preliminary survey of the Bras d'Or Lakes oyster areas in 1934 and brief supplementary investigations were carried on in 1935. In 1936 more intensive investigations were commenced which included experimental collection of spat to develop a source of "seed" and further exploration of the hydrography, bottom conditions, enemies and other factors affecting the development of oyster farming. Mr. G. F. M. Smith was employed in this work throughout the summer and had good success in collecting spat and in his general survey of the local conditions. These investigations are more fully reported elsewhere, and their results, and plans for future work are mentioned here only insofar as they concern the the formulation of a policy regarding leasing and general development of the industry. In order to understand the situation it is, however, necessary to summarize our knowledge of the natural conditions and the industry.

The oyster-producing region. Apart from very small quantities in inlets near Cheticamp and at Mabou, oysters occur in Cape Breton only in the Bras d'Or Lakes system. Even there they are limited to sheltered areas - probably because of the high temperatures required for reproduction. Well over 90% of the oysters fished come from highly enclosed water in Denys basin, near Alba and about St. Patrick channel.

The detailed distribution of the catches changes somewhat from year to year but is indicated in a general way on the accompanying charts. The greatest production is in the western end of Denys basin.

Topography. The region is a hilly one and the shores are highly indented. The charts show the profusion of sheltered, branching inlets and land-locked coves. In the Denys basin area, which is itself well sheltered, oysters occur along most of the shores but outside they are limited chiefly to coves, many of which support quite independent oyster stocks. The coves are well suited to any oyster culture operations requiring shelter and many provide the warm water necessary for good reproduction.

Steep shores are common and oysters occur principally in a narrow zone along the shore where firm bottom occurs in reasonably shallow water. Although the zone is sometimes wide, grounds at a distance from shore are commonly muddy and barren of oysters.

Here as elsewhere the bottom determines the detailed distribution to a large degree and influences the quality. Bottoms consisting principally of shell - the "beds" of many other regions - are rare. Firm gravel and sand bottoms producing oysters of good shape are reasonably common. Many irregular and long oysters, are, of course, present on muddy bottoms; but on the whole the shape is comparable with that of other regions.

The country is for the most part well wooded ant thinly settled. While the best producing areas, such as the western end of Denys basin, attract fishermen from quite a distance, many coves are fished only by a few local residents. On the whole the fishing population is small for the area.

Hydrography. Oysters require temperatures above 68°F for spawning, and rapid growth is favoured by warmth. The coldness of the water in the open "Lakes" is apparently responsible for limiting the natural occurrence of oysters to the highly inclosed areas. But within these areas temperatures suitable for good reproduction and rapid growth occur.

The water of the Bras d'Or Lakes oyster areas is of relatively low salinity. It is principally less saline than 23 per mille and much lower salinities occur extending down to the lower limits for oysters in the neighbourhood of 15 per mille. This compares with typical salinities of from 26 to 30 per mille in regions where the average quality of the oysters is considered high. The "freshness" of the water does not apparently affect reproduction or growth adversely but it is of great importance in producing a correspondingly "fresh" flavour and relatively weak shells - both generally regarded as low quality characteristics.

Quality, Demand and the fishery. The oysters of the Bras d'Or Lakes commonly have dark edges to the mantles (which line the shell) and some dark discolouration of the body generally. This is said to detract from their value in some markets and, combined with the relatively "fresh" flavour and weak shells, has apparently restricted the demand. The Bras d'Or Lakes oyster industry has depended on local markets and on a relatively low price in distant markets such as Montreal.

Under these circumstances and in a thinly populated region it is natural that the industry should be limited to quite an extent by marketing, and this has apparently been the case. It is only on grounds producing the better grades that the fishery has been intense. While some of these have been over-fished and apparently rendered unproductive, there have been considerable reserved of medium or poor quality oysters which have been fished with an intensity depending on demand.

In the twelve years from 1923 to 1934 the production as reported in the official statistics averaged about 1500 bbl. It

showed considerable variations - falling from about 2100 barrels in 1923 to about 1,000 barrels in 1929 and 1930, and rising again to over 2400 barrels in 1934.

Of recent years efforts have been made to improve the grading and packing and to enlarge the markets. In these valuable parts were played by the Nova Scotia government's marketing board through Doctor Cumming and by the Department of Fisheries through its local Inspectors. Shipments have been considerably increased and the fishery consequently has been somewhat more intense. There is reason to believe that further progress can be made in this line and that the industry will become limited to a greater extent by the productivity of the grounds.

That the problem of producing oysters in sufficient quantity to meet the demand will be of increasing importance is strongly indicated in two other ways. It was frequently stated during the visit that grounds which had been very productive recently are now fished out - indicating that on some grounds the fishing is exceeding the natural production. It is also worthy of note that the average size of the oysters being shipped is large - indicating that recent increases have depended on accumulated reserves rather than on an annual production.

Need for oyster farming. Thus it is evident that the industry would benefit from efforts both to increase the production and improve the quality.

It may reasonably be doubted whether the higher production of the past two years could be increased or maintained for any considerable period without supplementing the natural production by oyster culture. This is especially evident when it is borne in mind that marketing will limit the exploitation of the poor quality oysters of bottoms hitherto not intensively fished.

5 Public fishing by itself results in depletion of the best oysters first and consequent lowering of the average quality; and the effect is intensified by the fact that high quality grounds are usually less productive than low quality grounds. The firm bottoms and salty water required for high quality are commoner towards the open where temperatures are relatively low and reproduction and growth correspondingly poor. Oyster farming can offset this by using the most productive areas to obtain "seed" stock to be matured on grounds where the quality is high. In a region like the Bras d'Or Lakes where the average quality is relatively low the very life of the industry depends on maintaining or improving it and it is doubly important to keep the best grounds as productive as possible.

Prospects for successful oyster culture. Recent investigations have indicated that methods developed elsewhere for the production of spat can be used successfully in the Bras d'Or Lakes with slight modification. Experiments in spat collection met with good results and, although experience alone can show with certainty whether this can be repeated from year to year, the hydrographic conditions are promising for producing spat in many localities. It

is not believed that this basic step will limit production and it seems probable that enough spat could be produced to support a much larger industry and even possibly for use in outside areas.

It is planned to extend the investigations to include experiments in rearing small oysters, and the stocking and development of experimental areas. It is tentatively proposed that the latter include - 1. an area in the productive part of Denys basin, 2. an area, now barren, towards the open from the more productive areas and 3. an area in a more saline inlet outside the Bras d'Or Lakes but near. The development of these areas would be designed to evolve and demonstrate methods both for improving quality and for increasing production.

While definite proof must await the progress of these investigations there is every reason to believe that oyster farming methods may be adapted to achieve both these ends and that production can eventually be increased and extended to grounds now barren but suitable for producing oysters of good quality for this region.

As "freshness" due to the low salinities is perhaps the chief low-quality characteristic of Bras d'Or oysters, it is possible that transfer to saltier water for a relatively short time before marketing would greatly increase their value and it is proposed to make trials in this direction (area 3. above).

The administrative problem. It is, then, evident that oyster farming can probably both increase the production and improve the quality, and that it is only through oyster farming that there is any ppospect of a sustained expansion of the industry. This brings us to the problem with which this report is principally concerned - to arrive at the oyster culture policy most in the public interest. The crux of the problem is to avoid interfering seriously wit the public fishery on the one hand or fatally handicapping the development of oyster farming on the other.

While some barren bottoms suitable for maturing oysters are present and may be developed when suitable methods have been demonstrated, they are generally so situated as to make development difficult and production relatively slow and uncertain. Grounds now producing some oysters naturally and fished to some degree constitute a high proportion of the area suitable for development. It was agreed by all that to close all producing areas to leasing would prevent any general development of oyster farming.

On the other hand there was general agreement during the visit that some productive ground could be leased without seriously affecting the public fishery. Among the chief characteristics of the region are the relatively thin population and the fact that the fishing is spread over a great length of shore, much of which is in sheltered coves. Much of the ground is fished only by a few local residents and only a part of the producing area attracts fishermen from any distance.

To encourage oyster farming conditions must be made favourable. If the man of limited means is to participate in the development he must be able to obtain ground conveniently situated and easy to develop. If no producing grounds are made available a great many of those ready and willing to grow oysters would be

unable to do so, and such development as might possibly occur would be limited to those who could afford relatively risky or expensive operations.

A complication is provided by oyster leases issued by the Province under the agreement of 1912, of which about 35 are in effect. The 1936 agreement provides that these shall be continued by the Dominion government, which is reasonable because of the limited development work which has been done in some cases. But the areas were originally selected by the lessees principally for their high natural productivity and are scattered through the productive public areas. The presence of these leases makes it even less desirable to refuse leases of all other productive areas - a policy which would lead to some feeling of injustice on the part of those whose applications were refused.

It is realized that fully considered opinions cannot be expected on short notice, but members of the party agreed that there was no general disapproval of the principle of leasing on the part of those interviewed. However, some diversity of opinion was found regarding what areas should be leased. In general those living close to the more productive areas were in favour of little or no restriction of leasing while those from outlying districts wished to insure that the opportunity for public fishing would not be reduced seriously. Some opposition of interests is present here and it is necessary to reach a compromise which will be as just as possible to all concerned.

Proposed policy of reserving areas from leasing. In order at the same time to protect public fishing and to encourage oyster farming it was agreed to recommend that certain of the more productive areas be reserved from leasing and that the leasing of other grounds, even if productive, be permitted. Public fishing would be allowed generally on grounds not leased as well as in the reserves.

It is obvious that the principles on which such reserves might be selected would determine the effects of such a policy, and it was agreed that two principles were important:

1. The reserves should include ground which are now highly productive and which support a relatively intensive fishery at the present time - i.e., they should be grounds valuable for public fishing.

2. The reserves should be so selected that no region would be entirely cut off from leasing - i.e., the prevention of local residents from obtaining convenient leases of suitable ground should be avoided as much as possible.

These two principles correspond with the two points of view stated above. The most important area is that at the western end of Denys basin. Those from outlying districts wish to be assured that public fishing there will continue, but to make this whole area a reserve for that purpose would be unjust to the local residents who would then be at a disadvantage and who constitute a large proportion of the fishing population.

It was further agreed to recommend that all shores of Indian reserves be reserved from leasing. The Indians constitute about 20% of those in the public fishery and would perhaps be unlikely to engage in oyster farming to any great extent. The extent o the public fishing reserves is another difficult problem. Under the proposed policy public fishing would be carried on not only in the reserves but also on other grounds not leased. The reserves are proposed to safeguard public fishing and to assure that good grounds are available for that purpose rather than to constitute in themselves a sufficient area. While it is admittedly difficult to estimate how much leasing would occur, it was generally agreed that large areas would probably remain available for public fishing outside the reserves. Furthermore, if shore owners and local residents are given a preference in leasing, the lessees will be drawn largely from the ranks of those now engaged in public fishing.

In 1933, 1934, and 1935, there were 142, 168, and 153 licensed fishermen respectively. All did not have licenses in all three years and about 265 individuals were included. Of these about 11% were lessees, and, although ground has not yet been offered for lease, a number of applications have been received almost all of which are from fishermen included.

Proposed public fishing reserves. A number of reserves are suggested tentatively below. In the light of further investigations more may appear desirable, and details will require adjustment and completion. Reference is made to the accompanying charts on which fishing grounds are indicated in red (crosses marking productive and ovals unproductive areas), some notes given in yellow and proposed reserves shown in green.

(1). From Stoney point westward along the north shore of the south branch of Denys basin a distance indicated on the chart. This would include ground now producing oysters in good quantities. (Chart 1).

(2). The shores of Boom Island (in part an Indian reserve) including grounds on the southwest side, formerly highly productive and now producing smaller quantities of relatively high quality oysters. (Chart 1).

(3). Further reserves in Denys basin on the south side and towards the mouth of the River Denys. The actual selection will require further investigation. (Chart 1.)

(4). Shores of the Indian reservation at the head of Whycocomagh bay and some adjacent ground. (Chart 2.)

(5). Some grounds not yet defined in Washabuck river. (Chart 3).

(6). Some grounds not yet defined in Nyanza bay. (Chart 3).

The above list is entirely tentative although there was general agreement concerning all but (5). The writer believes that the latter will be required and that areas can be selected suitable for public fishing without preventing leasing by local residents.

Closure of areas producing very poor oysters. In the Bras d'Or Lakes, as in other regions, there are certain grounds which produce oysters of very poor quality. They occur principally at the heads of inlets where salinities are relatively low and bottoms predominantly soft. It was generally agreed that it would be in the interests of the industry as a whole if such areas were closed both to leasing and to public fishing. Especially in this region where the average quality of the oysters is low, it is important to avoid shipment of the poorest which seriously affect the marketing of the whole yield without contributing much to the value. Such areas are often very suitable for spat collection owing to high temperatures and the presence of many oysters. They should be available for that purpose but the oysters should not be marketed directly either through leasing or public fishing.

Examination of areas before leasing. It was generally agreed that, following the policy of the Department elsewhere, the areas desired should be reported on by a properly qualified biologist before applications for leases are approved. Applications should be approved only for grounds believed to be suitable for the production of oysters of reasonably good quality. The examination also provides an opportunity for close contact with the prospective lessee and for advising him regarding the selection of suitable ground and its development. If the examination showed the area, which was applied for, to be a particularly good public fishing ground there would be an opportunity for the Department to consider the desirability of including it in the reserves for that purpose.

Surveying, marking and shape of leases. As the oyster grounds are largely limited to the shore zone, it is not believed that a system of leasing subsections on an established grid could be applied to the Bras dOr Lakes to advantage. Such a system would entail the inclusion of a very high proportion of unsuitable ground in each lease and would involve a great deal of unnecessary surveying and marking.

It would usually be possible to define a lease satisfactorily as a strip of given width along a stretch of shore defined by permanent marks on land. In such cases it is believed that the only permanent marks needed would be range stakes on shore at either end of the lease and that temporary stakes would suffice for the water boundaries. It is pointed out that the very small tides in the Bras d'Or Lakes oyster areas contribute to the ease of definition of shore zones by making the intertidal zone very narrow indeed.

Limitation of total area and of shape of leases. The limit of area of a single lease issued by the Province has been 5 acres. This is considered a reasonable limit and is very close to that applied by the Department of Fisheries in Prince Edward Island (5½ acres). The 5-acre limit is now generally accepted as a reasonable one in the Bras d'Or Lakes and it is not believed that any useful purpose would be served by changing it other than uniformity with the Department's policy elsewhere.

The zone of suitable bottom along the shore is sometimes less than 50 feet wide and to comprise 5 acres this would mean a strip almost a mile long. This is believed to be an excessive length of shore for a single lease. On the other hand the policy, which was adopted by the Province in recent years, of allowing no lease to be more than twice as long as wide means that if the zone of suitable ground is narrow the area of the lease is limited drastically unless it includes a very high proportion of useless ground. A minimum width of about 50 feet and a maximum length of about 2000 # feet is suggested.

Importance of experimental and demonstration work. While detailed plans are presented elsewhere, the importance of further investigations and of the establishment of demonstration work is emphasized.

The results of investigations in the Bras d'Or Lakes hitherto have been very briefly outlined above. They have served to give a picture of the general conditions and have made a start at adapting oyster cultural methods t the local needs (especially in regard to spat collection). But the special problems of the local industry remain largely unsolved and it is essential for its sound development that experimental oyster farming and general investigation of the region's special conditions be continued.

Experience elsewhere has shown that no general development of oyster farming can be expected without demonstration of the success of methods which are developed and advocated. It is believed that the failure of lessees in this area to develop their areas has been due in part at least, to ignorance of the possibilities and to lack of information on proper methods. It is very important that the information be placed before them as clearly and forcibly as possible, and this can be done only be actual demonstrations. There was evidence of considerable interest in the work carried on in 1936 and this is expected to increase with the need and the opportunity for oyster culture.

Ellerslie, P.E.I.,
December, 1936.