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FISHERIES RESEARCH BOARD
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A Survey of Some of the Clam Producing Flats of Nova Scotia

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The experimental work on clams conducted at Weymouth North during the summer of 1941 was supplemented by a survey of other natural clam producing areas of Nova Scotia.[1] The survey was made during the first half of September and was for the purpose of providing the basis for reasonable regulation and to assess the opportunities for clam farming. Information was therefore obtained on the approximate areas of suitable clam flats and on the distribution and abundance of various sizes of clams.

For the purpose of clam culture information was obtained on the presence of seed stock either on over-crowded areas or on areas at high levels where growth is poor. Note was made of suitable flats for leasing where bottom conditions are favorable and the absence of a worth while fishery makes leasing possible.

For the purpose of conservation the size of the whole area and the abundance of clams was noted in each locality since this factor is important in order to estimate the quantities which might be taken without causing serious depletion or as a basis for dividing the area into several to be opened in rotation.

Note should be made of the fact that considerable clam digging was carried on in some of the areas discussed in this report after the survey was made. This factor may cause some discrepancies between certain figures contained herein and those that might be obtained from a future inspection.

It should be futher noted that it was not possible, within the time available to visit all of the areas at "spring" tides. As a result some of the flats may be more extensive than reported.

Clam Harbour

Clam Harbour is made up of approximately two hundred acres of sandy flat most of which is exposed at any low tide. The entire area appears to be suited for clam production. In fact in the eastern and middle sections of the harbour small clams are so numerous that it is doubtful whether they will attain full size because of their crowded condition.

Public fishing is confined to the West side and to Indian Cove near the mouth of the harbor where a square foot of flat yields on the average four to seven marketable clams. Shallow channels run through the flats and it is along the sides of these channels that the largest clams are obtained. The area should provide ample space for farming for this locality without interfering with the public fishery.

1. This survey, as well as the experimental work at Weymouth North, outlined in a separate report, was carried our under the direction of the Fisheries Research Board of Canada, with assistance from the Nova Scotia Economic Council.

It should be mentioned that there are clam flats outside of Clam Harbour as well as to the eastward. Time did not allow for a survey to be made of these areas.

Musquodoboit

Musquodoboit Harbour is a vast area of not less than one thousand acres of sand flats. Much of the flat has a natural means of conservation in that the period of exposure is relatively short. In fact a large part is bared only on the full tides. The flats are located chiefly between Goose Head and Baker's Island, outside of Baker's Island, between Baker's Island and Indian Head, around Indian Heat and in "Butneygum".

"Butneygum" is an extremely isolated area which must be reached by boat early on the ebb tide and cannot be left until well on the flood tide. This is the largest single flat of the area being approximately one mile square.

There is an abundance of clams of all sizes at Musquodoboit, but the distribution is by no means uniform. It is quitepossible that there are unward of twenty thousand barrels of marketable clams available over the entire area.

Because of the great extent of flat, there is plenty of space available for a good public fishery, as well as for leasing purposes.

Petpeswick

Although this is an extensive harbour, there appears to be only three sections suitable for the production of clams. One of these is a sand-mud flat situated above the "Narrows". Although broken into a number of small flats by cross channels the total area comprises about fifteen to twenty acres which supports a good public fishery and at the same time has an abundance of small clams of all sizes.

Below the "Narrows" there is a somewhat larger flat, perhaps thirty acres, yielding a slightly higher percentage of marketable clams and fewer small ones. The size of this flat is being gradually diminished by the encroaching of shifting sand.

Near the mouth of the harbour on the east side there is a cove where a few clams occur. Herethere are about twenty-five acres of sand flat. The bottom conditions here are good and the absence of a worth while fishery makes leasing possible.

Port La Hebert

This flat is in the form of a long narrow (25-50 yards) sand bar extending up the west side of the river for a distance of six or seven miles broken here and there by water passages which traverse it. Near the mouth of the river it is almost a pure white sand, above which it contains varying quantities of mud. A very soft mud flat separates the bar from the north and west shores while the channel separates it from the east shore, consequently it can be reached only by boat. Most parts of the flat are exposed for only

one and a half to two hours a tide. This factor serves as a natural means of conservation. Most of the digging for commercial purposes is done on the lower four miles of the river where the averageyield amounts to fifteen to twenty-five clams per square foot. Of these only three or four are under an inch in length and while the remainder range up to three and one half inches the majority ranging around two inches.

About four miles up the river at Beal's Flat there is a greater abundance of clams, but they are mostly small, so much so that they are rarely dug. This flat would supply suitable stock material for planting purposes.

Port La Hebert, as a whole, has the disadvantage of being even more isolated and inaccessible than Sable River.

In contrast with the results of the experimental work conducted at Weymouth North it was noted here that the nature of the flats was such that clams left on the surface buried themselves within twenty four hours.

Sable River

Situated near the mouth of Sable River are a number of isolated flats on which clams occur. At the present rate of digging the flat would not be depleted very soon, but should such a condition arise through more extensive operations it would lend itself to division for the purpose of rotation. These flats must be reached by boat at all times and since they are far from any residential district their usefulness as farming areas is questionable.

The following is a more detailed account of the individual flats comprising the Sable River district.

Pierce's Flat is a flat of about ten acres, the edges of which consist of a soft mud. The rest of the flat consists of a pure white sand which even gives evidence of shifting. Only scattered large clams were found.

Mill's Flat is an area of about two hundred by twenty-five yards in the middle of the river. It too, is made up of shifting sand. Clams are few and far between, but those present are four inches or more in length. Here, as well as in Pierce's flat, clams once occurred in commercial quantities. Evidence seems to indicate that the disappearance of the eel grass has allowed for a change in the nature of the bottom making it less suitable for clam production.

Latham's Flat is an area five hundred by thirth yards on the west side of the river. The edges are soft, but the top is firm being chiefly sand with sufficient mud mixed throughout it to prevent shifting, and this flat yields on an average about thirty to fifty clams per square foot about half of which are two inches in length,the other half being equally divided between smaller and larger ones.

Moody's Flat Around Moddy's Island there is a flat of approximately forty to fotty-five acres. The portion of the flat which lies directly south of Latham's is sandy and theclam population of the two is very similar. Toward the western side of the flat it becomes somewhat softer which a greater abundance of clams which are somewhat smaller in size. This area might possibly serve as a stock area.

The Hohn Island Flat is a sandy flat of only four or five acres near the mouth of the river. The clams are larger than those found on the other flats. On the average the distribution is such that a clam basket could be filled from an area seven by three feet.

The Calf Pasture Flat lies on the east side of the river opposite the John Island flat which it resembles in bottom conditions as well as in size and distribution of clams.

John Smith's Flat This flat of sand and mud is on the east side, but up the river beyond the others. It is about a quarter of a mile in length ranging in width from fifteen to twenty yards at one end to fifty yards at the other. The size and distribution of clams is similar to that of Eatham's Flat.

Wedgeport District

West of the town of Wedgeport lies the ~~Chebogue River~~ Goose Bay, the channel of which divides a vast mud flat of two hundred to three hundred acres into two equal areas. The flat on the east side of the channel is very soft and has never been of use for clam production. On the west side of the channel the flat, although softer, than most areas surveyed, it firmer than that on the east side and at one time yielded clams on a commercial scale. This flat is now practically depleted except for a few medium sized ones on the bank of the channel.

Inside Sheep Island and the "Passage" lies another flat of fifteen to twenty acres which is the best clam producing area of the Wedgeport district. Here the clams seem to occur in patches which in most cases are only twenty feet square. In the areas between these patches no clams occur, but a few inches below the surface an abundance of old clam shells occur.

Within this flat all types of bottom are to be found ranging from a hard sand to a soft mud and even some of a fibrous nature. It was within one area of such texture that many clams less than an inch in size, were found. As many as sixty were obtained from a square foot of flat.

Across a small channel from the Sheep Island Flat in the direction of the mainland lies a larger flat of probably fifty acres. Most of this flat is now shifting sand and devoid of clams except for a small quantity of no commercial value in near the shore and around the ledges.

Between Sheep Island, the "Passage" and the arm extending to the mainland one one side and Great Tusket and Calf Islands on the other lies a flat of approximately onehundred acres which is likewise becoming hardened by encroaching sand and on which no clams occur except for a few in near the shore.

East of the town of Wedgeport is the ~~Wedgeport~~ Tusket River with a large flat of five to six hundred acres. Although once the source of many clams, not a single one is to be found today. The flat is very sandy and shows some evidence of shifting, a factor which may account for the disappearance of the clams. However, since the eel grass is beginning to reappear, a little experimenting might prove the area to be of considerable value, either as a leasing ground or as a public fishery if it could be re-stocked.

There is, west of the Wedgeport district, a considerable area which possibly may prove valuable in connection with clam production. Time, however, did not permit for a survey to be made of this region.

St. Mary's Bay

At the head of St. Mary's B ay is a large flat of five or six hundred acres. For a distance of approximately two or three hundred yards out from the inner-shore the bottom is very soft. Outside of this only the surface layer of two or three inches is soft, beneath which is a hard flat of sand and gravel. Throughout t his are many stones of all sizes, a factor which interferes greatly with digging. The only clams to be found inthe entire area are a few stunted forms in among the rocks on the inner shore. A planting was made here to test its suitability for clam production.

Gilbert's Cove is a small flat of about twenty acres. It has a hard bottom of mud, sand and gravel. A few clams occur in scattered patches, but they are old and stunted and never more than two inches in length.

Annapolis Basin

Moose River This river bed goes completely dry at low tide leaving a mud flat on either side which varies from a soft mud near the channel to a firm clay-like mud near the upper shore. In the firmer part of the flat clams occur, eight to ten to the square foot. Of this number two or three would be of marketable size. Near the upper shore line more small clams, but fewer large ones occur.

Near the mouth of the river very few clams are found along the river banks, but the bed is sandy and yields as many as sisty to seventy small clams per square foot of flat. These range in size from sets up to an inch and three eights.

Judging from the growth rings on the shells the rate of growth in this area is more rapid than that of the Sissiboo River district.

Zwicker's Cove is a small area of four or five acres on which the clam distribution is rather spotty. However, on the inner shore where they are found there may be as many as twenty-six per square foot of flat of which only about three would be marketable. Further down the shore fewer clams are available, but they are larger in size.

In the Cove west of Zwickers there is a flat of fifty or sixty acres. The inner half of this flat is a mixture of sand and gravel on top of which is an inch or two of heavy clay like mud. This is one of the areas that supports a considerable public fishery yielding as high as thirty-six clams to the square foot. Of this number six to eight are of marketable size.

The outer half of the flat becomes progressively softer in the direction of the channel with a corresponding decrease in the number of clams.

Goat Island There is a large flat of approximately one hundred acres situated north and east of Goat Island. Roughly three quarters of it is made up of a heavy mud flat with a very uneven surface. Although this whole area produces sufficient clams to support a public fishery, they are somewhat more plentiful in the vicinity of the many rocks that are scattered throughout the mud because it is in such places that the bottom is firmer.

The remaining quarter is a sandy flat in which there is an abundance of clams of all sizes, including "sets" for 1941.

Above the island the flat becomes softer and clams are relatively fewer in number.

Deep Brook is an area of about ten acres. Clams occur naturally, but they are small and the bottom is hard and rocky which makes digging very difficult. Although from fifteen to thirty clams may be obtained per square foot of flat only one or two of these would be of marketable size.

Chrome Cove Only small clams occur at the west end of Chrome Cove, which is rather ledgy. Between the ledges the bottom has a surface layer of three or four inches of coarse sand beneath which is a heavy clay.

In the middle and eastern sections of the cove the flat is sandy and produces clams of all sizes. This area would, when surveyed, yield upward of two hundred barrels.

Here, too, there was plenty of evidence of 1941 set, the catch occurring chiefly along the ridges and on the uneven sections of the flat.

The Thorne's Cove flat is by far the best in Annapolis Basin. It is a large flat ~~by three or four~~ of about one hundred acres, two-thirds of which is composed of a coarse sand and mud. It has yielded an abundance of clams, but the quantity has now been greatly reduced due to extensive digging particularly during 1941. The distribution of the remaining clams is spotty. Where they do occur it is often possible to obtain anywhere from one to five per square foot of flat, but on the other hand often a considerable amount of territory may be covered in which only a scattered clam is found.

Near the inner shore there is a mud flat on which small clams are found, averaging about ten to twelve per square foot. Elsewhere in the flat very few small clams occur.

West of Thorne's Cove there is a shell bar in the vicinity of which some small clams are obtainable.

West of Black Point there is a large flat of ~~one hundred and~~ fifty to one ~~two~~ hundred acres, the greater part of which consists of a very soft flat devoid of clams. However, scattered throughout this area are patches, twenty feet square, of firm bluish grey mud which often yields as high as fifteen to twenty marketable clams per square foot. Along the inner shore is a zone approximately twenty feet in width of a fibrous texture in which many small clams, thirty to forty per square foot, occur. These are generally stunted and are quite similar to those on the inner shore of the Sissiboo River district.

Location of Flats Surveyed, 1941

Halifax County

Clam Harbor
Musquodoboit Harbor
Petpeswick

Shelburne

Port La Hebert
Sable River:
- Pierce's Flat
- Mill's Flat
- Latham's Flat
- Moody's Flat
- John Island Flat
- Calf Pasture Flat
- John Smith's Flat

Yarmouth

Wedgeport District:
- Chebogue River
- Sheep Island
- Great Tusket and Calf Islands

Digby

St. Mary's Bay
Gilbert's Cove
Sissiboo River (Experimental Work)

Annapolis

Annapolis Basin:

- Moose River
- Zwicker's Cove
- Goat Island
- Deep Brook
- Chrome Cove
- Thorne's Cove
- Black Point

Survey of Clam Producing Flats of Nova Scotia
(Continued from 1941)

by

R. A. Ingalls

The clam survey work of 1941 was continued during the summer of 1942 although it was subordinated to the Irish Moss exploration because of the urgency of an immediate application of the latter.

Between Liverpool and Halifax no flats of commercial importance were located. A number of "potholes" occur which provide clams for local consumption in each case as well as for bait for fishermen. Only a few of these flats need to be considered here.

At Cohoon's Island near Port Medway, there is a small sand flat of three or four acres from which very small quantities of clams are obtained. Near the rocks on the upper shore line there are greater quantities of clams, but they are small in size.

A similar flat occurs at Rugged Harbour, but here the clams can only be obtained at extremely low tides.

On the shore of the inner basin at Cherry Hill there are a few acres of sand and mud flat, but clams are so scarce that the area is of very little importance.

At Corkum's Island, west of Lunenburg, there are three or four acres of sand flats which yield ashigh as fifteen to thirty clams to the square foot. Only two or three of these would be of marketable size, however. Nearby at First South the entire shore line has a narrow zone of gravel and mud flat which yields sufficient clams for local use. A similar narrow zone occurs around the greater part of "Back Harbour" at Lunenburg.

On the north side of Mason's Island there is a sandy flat of a few acres where clams are somewhat more plentiful and larger in size.

Five Islands and Vicinity

At Five Islands there is an extensive flat between one and two miles in length. The inner zone of this flat (200-300 feet in width) is composed of a clay like mud throughout which are many rocks. This area will yield as high as thirty-five or forty small clams ($1\frac{1}{4}$"x$1\frac{1}{2}$") to the square foot. Outside of this is a zone of mud flat in which clams are irregularly distributed. They are considerably fewer in numbers, but larger in size. Beyond this is to be found gravel patches scattered through the mud and in which clams of marketable size occur. Although sufficient clams remain for local use, the area has been almost depleted by diggers operating for a local cannery.

Beyond this zone there is a sand bar which is continually shifting and on which no clams are to be found.

At Lower Economy there is another large flat between one and two miles in length and between one quarter and one half of a mile in width. This flat is largely composed of alternating areas of sand and gravel, much of which is shifty. However, considerable numbers of clams do occur on some parts of the flat, as many as thirty five per square foot having been obtained in some cases. Small, medium and large clams occur in equal numbers.

A somewhat larger flat is located at Upper Economy and Bass River. This flat, however, is far less suitable for the production of clams than were those just described. A large part of the flat is composed of clay which varies from a soft clay near the inner shore to a very hard clay near the low tide level. Scattered irregularly through this flat are gravel patches of varying sizes in which a few clams occur. These are mostly over two inches in length, but not present in sufficient quantities to be of much value. Somewhat larger quantities of small clams ($1\frac{1}{4}$" - $1\frac{1}{2}$") occur in the clay zone near the inner shore.

It should be noted that all of the clams at Five Islands and at Upper and Lower Economy were stunted in growth, exhibiting very thick shells with growth rings very close together. This would suggest that growing conditions are not satisfactory in this area for clam culture work.

Chezzetcook

At Black Point near the mouth of Chezzetcook Harbour there is a large sand flat approximately one mile square. The outer part of this flat has a rippled surface which is evidence of shifting. The remaining part of the flat has an abundance of clams which are unevenly distributed. A very small proportion of these, however, are two inches in length so that the flat is at present of little commercial value. Farther up the harbour to the eastwardof the islands there are two small flats varying in size from five to fifteen acres. The nature of the flats and their clam populations is very similar to that of the larger flat near the mouth of the harbour.

This whole area has been depleted to such an extent, so far as marketable clams are concerned, that the local diggers go elsewhere in order to dig for commercial purposes.

This condition likewise applies to the Petpeswick flats where the fishermen are anxious to have an area reserved for local use or some system established whereby the clam supply will not be entirely exhausted.

Indian Cove

At Indian Cove near Clam Harbour, there are about twenty-five acres flats about one third of which consista of a very soft mud. Throughout the rest of the flat which is mostly sand as many as twenty or thirty small clams are found within a square foot. In the other part of the flat near the channel some large clams are still to be found, but usually not more than two or three to the square foot.

Yarmouth

At Yarmouth Bar there is a good sand and mud flat of about twenty-five acres. This has been depleted of clams to such an extent that it yields only about seven buckets per man in a tide. Most of the clams are about two inches in length with a few smaller in size. Very few larger clams are to be found. Judging from the growth rings on the shells the rate of growth is rapid in this area.

Pembrook

At Pembrook Bar there is a sand flat of about ten acres. At one time clams were very plentiful here, but are now very scarce, probably because they have been killed by the shifting bottom. Because of the shifty nature of the sand the flat is at present of very little value for the cultivation of clams.

Chebogue

At Chebogue there are extensive flats, about sixty or seventy acres of which are very suitable for the cultivation of clams. Part of these flats are sand and the remainder consists of a mixture of sand and mud. Within recent years they have yielded between one and two thousand barrels of clams in a single year. They are now greatly depleted although small quantities of clams of all sizes are still to be found.

According to the Fisheries Inspector, Mr. Fraser, this area was recently closed by the Public Health Department, without testing the water, because of the Yarmouth air port which is situated at least four miles up the river. In view of thefact that the flats are situated near the mouth of the river the local people would like to know whether this act was necessary.