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SHELLFISH SURVEY OF ESTUARIES AND BAYS OF WEST CORK.

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INTRODUCTION:

A survey was carried out in the summer of 1971 in the estuaries and bays of West Cork, by biologists from the Department of Agriculture and Fisheries. The purposes of the survey were to:

(1) determine the potential of this area for possible shellfish farming;

(2) discover any existing beds of edible mussels or other commercial shellfish species; and

(3) describe the type of mussel found in each area.

METHODS:

Areas selected for investigation were subjected to three types of examination -

(a) Examination of Intertidal Zone: Using a 25 cm quadrat at various points in the selected area the number of animals both on the surface and below it, to a depth of a half metre, were estimated. Core samples to retain small fast moving animals were also taken.

(b) Examination of Sub littoral zone: These surveys were carried out in all areas using a standard 4 foot dredge and/or a small shrimp trawl. The duration of each haul varied in the different areas according to conditions.

(c) Hydrographical and chemical studies: These consisted of an examination of temperature, salinity, oxygen and BOD recordings from each area. (Table 1.)

AREAS EXAMINED

The areas examined and their corresponding admiralty chart numbers were as follows:- (1) Kinsale Harbour (2053),
(2) Courtmacsherry (2081), (3) Clonakilty estuary (2080),
(4) Roscarbery Bay (2092), (5) Glandore Harbour (2092),
(6) Castletownsend (2092), (7) Roaring Water Bay (2129),
(8) Dunmanus Bay (2552), (9) Bantry Bay (1838).

The type of area most suitable to support large quantities of commercially valuable shellfish is one where a stable substratum of firm sand or gravel is present; conditions favour frequent successful

spatfalls; there is a plentiful food supply usually resulting in rapid growth and an absence of pollution.

RESULTS OF AREAS EXAMINED

KINSALE

Intertidal or littoral zone - In this zone the substratum varies from mud to firm shingle. A bed of intertidal mussels containing approximately 30 tons was located at the Gully Bridge. These mussels were of good size and quality and 69% of them were commercially sized. The meat yield was 12.8%, which is reasonably good for intertidal mussels.

Sublittoral zone: The bottom type was firm mud from the Iron Bridge to Kinsale town but it was sandy mud from James Fort to the mouth of the harbour. Both mussels and oysters were dredged from this area but the quantities were very small and all mussels contained the parasitical pea crab (Pinnotheres pisum). The meat yield was 21.0%. The area from Kinsale to the Iron Bridge had a firm muddy bottom and is suitable for shellfish farming but the area from James Fort to the outer extremity of Kinsale Harbour is unsuitable. Small quantities of the shrimp Palaemon serratus were found in the area.

COURTMACSHERRY

The estuary of the river Arigideen extends from below Timoleague to Land Point and Coolmaine Point.

Intertidal zone: Three types of bottom are found in this zone namely -

(a) An area with a very muddy bottom extending from Mahom Abbey to Timoleague.

(b) An area of shifting sand in the centre of the estuary, and

(c) A hard firm sand at the mouth of the harbour.

Two mussel beds were found, one at Mahon Abbey and the other at Harbour View. The bed at Mahon Abbey covered about two acres and contained an estimated 60 tons of mussels, while the Harbour View bed covered about one acre and contained approximately 20 tons. (Cockles were also abundant in the area around Mahon Abbey). Mussels on this latter bed were, however, old and their growth appeared to be stunted in comparison with those from the mud flats at Mahon Abbey. The meat yield was 13.0%. The sublittoral zone was rather small and as was shown

by the presence of different varieties of seaweed, the bottom was stable. However, no commercial quantities of shellfish were located. The substrata would provide an excellent growth area for transplanted mussels if it were cleared of the perennial and annual seaweeds.

CLONAKILTY

The estuary of Clonakilty which is more sheltered than that of Courtmacsherry, has a very unstable bottom. It consists mainly of sand except for some areas in the upper reaches where the bottom is muddy sand or pure mud. Because of the sheltered position there is practically no water circulation in the estuary.

Intertidal zone:- A bed of intertidal mussels exists in the muddy part of the estuary and extends over about 20 acres. The mussels are scattered in clumps and consequently it was difficult to estimate the total quantity accurately. However, only about 20 tons of young mussels suitable for transplanting were estimated to be present. Cockles were abundant in this area.

Sublittoral zone: Because of the very unstable bottom, no commercial shellfish were found in this area. As an indication of the instability in this area several cwts. of mussels from the intertidal zone were transplanted to the sublittoral zone but they had completely disappeared after two months. Attempts to carry out raft culture of mussels in this area also failed and the area generally has little potential for shellfish farming.

ROSCARBERY.

This is a small bay divided by a causeway. The bottom on the sheltered land side of the causeway is mud and has little water at low tide. The seaward side of the causeway is, however, uniformly sandy.

Intertidal zone: Mussels were very scarce in this area and the few that were found were confined to the periphery. Some cockles were also found but again they were not present in commercial quantities.

Sublittoral zone: No commercial quantities of any shellfish were found in this area, and the area has little potential for shellfish farming.

GLANDORE HARBOUR

Within this area, three points were selected for investigations

viz. at Leap, Glandore and Union Hall. The bottom varies considerably, ranging from mud in the upper reaches near Leap, to firm mud and gravelly mud at Union Hall and sand banks below the bridge at Union Hall.

Intertidal zone: Large quantities of palourdes (Venerupis decussata) were found exposed on the sand flats in this area. However, sand banks themselves are indicative of fairly turbulent conditions. Therefore, it was not surprising that no mussels were found because spat do not settle under these conditions. The fact that mussel spat has settled on the bridge indicates that larvae are borne into the Harbour in large numbers. Large quantities of excellent quality mussels were found adhering to the bottom of a boat moored in the centre of the Harbour.

Sublittoral zone: No commercial quantities of shellfish were taken from this zone, but the bottom which was a mixture of stable mud and sand would be ideal for shellfish farming.

CASTLETOWNSEND

A large area of mud, at the top of the inlet i.e. to the northern end, is exposed at low tide. The remainder of the area is subject to a certain degree of exposure while a sandy bottom is found at the seaward end of the inlet.

Intertidal zone: Some mussels of good quality were found attached to the rocks in this zone but surprisingly no mussels were found which had settled on the mud flats. Possibly the tidal movements may have prevented the settlement of mussel spat.

Sublittoral zone: No shellfish of commercial value were found in this zone.

ROARING WATER BAY

The rocky shores of this large bay are semi-exposed but the broken nature of the coastline and the numerous islands minimise the force of the winds and seas. Selected areas of this bay were investigated as follows:-

Intertidal zones:

(i) Schull: An area on the northern side of Schull Harbour where mud flats lay on either side of a channel was examined . Mussels of commercial size and good quality were found but the quantity was very small. A few cockles were also found but no commercial quantities.

(ii) Ballydehob area: Towards the middle of the estuary a large area of mud flats supported a bed of mussels. It was not possible to sample these mussels because the mud was too soft. However, there was an extensive growth of Zostera sp. around and within the mussel bed. This association of mussels with Zostera sp. was similar to that found in the Clonakilty inlet.

(iii) Toormore: This area was composed of small mudflats and numerous scattered groups of rocks. Periwinkles were abundant, attached to stones, although no other shellfish were found.

Sub-littoral zones:

Nothing of commercial importance was found in the sub-littoral zone area in any part of Roaring Water Bay and only small areas had substratum suitable for farming e.g. parts of Schull harbour. In areas around some of the islands mussels were found growing on all surrounding and projecting rocks, indicating a good spat fall in the area. However, the spat do not seem to survive.

DUNMANUS BAY.

This bay, which is exposed and deep has little or no sandy or muddy intertidal areas.

Intertidal zone: The sea urchin Paracentrotus lividus was very abundant at ten different locations near Durrus and averaged 64 individuals to the square metre. The beaches in this Bay consisted mainly of fine and coarse gravel, held together by fine sand. Mussels appeared over a large area, adhering to boulders and to gravel surface. This area appeared to have considerable potential for farming and requires further study.

BANTRY BAY (Whiddy Island to Glengarriff)

Within the Whiddy Island to Glengarriff area the degree of exposure varies. The bottom type varies from sandy areas, which are exposed, to muddy sand in the sheltered areas.

Intertidal zone: Some small mussels were located at various places in this area.

Sub-littoral zone: Although no commercial quantities of shellfish were located by trawl or dredge from the sub-littoral zone considerable quantities of mussels were found adhering to the supports of the oil jetty at Whiddy Island. These mussels were excellent in quality. Paracentrotus lividus was also found in this area and would be suitable for transplanting to other areas.

SUMMARY.

The establishment of a commercially viable mussel bed depends on a number of factors, all of which are interdependent and vital for the continuous survival of the bed. Conditions must be such that the adult mussel will reproduce successfully each year; that the resultant spat will settle on a stable substratum suitable for future growth; that sufficient food be available to ensure a rapid growth rate and that predators and parasites be present in negligible quantities. Mussel farming may be carried out in two ways, namely (1) General cultivation, i.e. by availing of supplies of young spat and transplanting them to areas where conditions ensure rapid growth and development or (2) Raft culture. This is one of the artificial methods of cultivating mussels by using timber structures from which hang ropes on to which mussels settle.

It was noticed throughout most of the bays, inlets and estuaries on the west Cork coast, which are exposed to winds and tides, that stunted mussels, which grow very slowly, were present in very large quantities. There is also evidence that there were considerable quantities of spat available in most of the areas examined. Another important point was the fact that in some of the sheltered rocky shores surrounding the estuaries, large well developed mussels in excellent condition were found, indicating that mussels will grow to commercial size in some of the areas examined. Survival of young mussels is greatest in the intertidal zone, which dries out for a period each day. This is because predators are limited in the area in comparison to the sublittoral zone where they are active at all times. The best use, therefore, of sublittoral mussels would be to transfer them to suitable

intertidal areas. In relation to the above points the potential of the various areas for shellfish farming may be summarised as follows:-

A. Areas with little or no potential.

Clonakilty: This area is generally unsuitable for farming because of the unstable bottom. However, large quantities of mussel larvae are produced in the area and these could be induced to settle on artificial collectors and transferred to a more suitable bay or inlet in the vicinity.

Roscarbery: This Bay is considered unsuitable for reasons similar to those prevailing at Clonakilty.

B. Areas with potential.

Whilst some of the following areas, Kinsale, Glandore Harbour, Schull Harbour may at present be unsuitable for cultivation because of excessive weed growths the estuary of the Ilen river, Dunmanus Bay, and parts of Bantry Bay appear to be suitable for ground cultivation of mussels. Weeds could be removed by dredging, thus making available more productive grounds. Other areas could be made suitable for carrying mussels by converting mudflats into shingle mud flats by covering them with gravel and stones.

Raft cultivation, tried in Kinsale in 1969 resulted in excellent growth rates in mussels and this method is considered suitable for a number of areas, including Glandore Harbour, Toormore, Dunmanus Bay and parts of Bantry Bay. Dunmanus Bay is particularly suitable for this method as there is very little navigation in the area. Excellent seed mussels suitable for either raft culture or ground transplantations were found at the oil terminal in Bantry Bay.

Finally the shore sampling of the resident flora and fauna and the oxygen and BOD analyses indicated that pollution is not a problem in the estuaries in West Cork.