

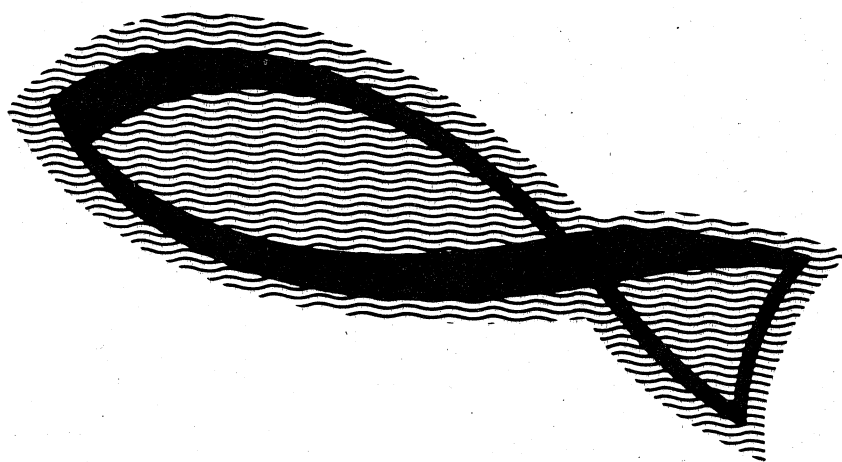


**Fishery Leaflet  
Number 77  
1975**

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**A study of some invertebrate  
resources within Bertrabouy  
Bay, Connemara.**



**by**

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### SUMMARY

This study of invertebrates in Bertrabouy bay was a by-product from an investigation of the distribution of escallops in Connemara examined by SCUBA diving and dredging. The bay is about 5 miles by 2 miles and has many small inlets and islands; it deepens to 18 fathoms near its entrance. Most of the escallops and lobsters are fished from the centre of the bay to its entrance. Small populations of escallops are fished with hand nets at the head of the bay where oysters were once cultivated on banks which are often covered with eelgrass. Cluaisíns are picked from the banks and winkles are found intertidally throughout the bay.

In the course of the study an unexploited lobster population was discovered in the centre of the bay. Crawfish are taken at the bay entrance where razorfish and otter clams were also found. The oyster banks could be examined for future development and the use of a portable shellfish harvester to collect razorfish might be investigated.

### Introduction

This study is a combination of observations made while studying the scallop Pecten maxim L. during the summer of 1974. The work was conducted with the aid of a Department of Education grant when the author was studying at the Shellfish Research Laboratory of the University College Galway in Carra. Many of the observations were made while diving. The distributions of animals indicated in this report may be more extensive than shown, but only the areas from where the animals are known to occur have been recorded. This study provides an indication of the present status of a number of benthic species in Bertrabouy Bay.

### Methods

The distribution of animals has been examined from dredge samples, diving observations, and from direct observation of the intertidal region. Dredge samples were obtained using a standard triangular frame, four foot dredge with tooth spacing at 10 cm. intervals from vessels engaged in scallop fishing. Standard SCUBA equipment enabled underwater observation subtidally to 105 feet. Some estimates of animal densities were recorded but these are qualitative because they only represent apparent numbers of adults seen.

### Results

Depth contours of the bay and the main substrate types are displayed in Figure 1 and dive locations, areas of dredging and intertidal observations in Figure 2.

Outcrops of rock and large boulders are frequent from the entrance to the centre of the bay. The main sediments are broken shell, with dead coralline algae and detritus, from the centre of the bay to mud at the head of the bay. Where there is an increase of water velocity in channels between islands etc., banks of shell with dead and live coralline algae may be formed into shallow dunes. These banks are often covered by the eelgrass Zostera marina and bootlace-weed, Chorda filum. Oysters have grown or been cultivated on many of these banks in the past, and on some banks small numbers survive.

A large spur of rock obstructs the southern side of the bay entrance causing a large eddy to form on the eastern side during tidal flow. Drifts of algal detritus and softer sediments are found in this region. There are many bifurcations of the main current after it enters the bay due to the complex topography of the bay indentations.

These currents appear to vary with the strength of the water movement causing the formation of wandering eddies.

Three rivers drain into the bay, the Gowla, the Gowlabeg, and the Ballinahinch river. The large freshwater runoff of the Ballinahinch river may effect the distribution of certain marine animals in Cloonisle bay (Fig. 1). At the head of this bay there is a very pronounced halocline.

A series of representative profiles are presented in Figure 5 to 12 demonstrating the gradient, substrate type and presense of species. These profiles are not drawn to scale and are intended only to provide an outline of the topography and relationship of the species indicated.

The extent of the fisheries within the bay are presented in Figure 3, Figure 4 demonstrates the observed distribution of the species discussed in this report.

#### Species Exploited

##### Crustacea

Lobsters (Homarus gammarus) have been recorded from most rocky areas within the bay, but the majority of the traps are fished adjacent to the bay entrance. The mean estimated catch of lobsters per hundred traps fished ranges from 13-20 lobsters of approximately 2 to 2½ lbs average weight. During one dive a large lobster of about 6 lbs was observed recessed in rock rubble adjacent to one of the outcrops in the centre of the bay. Traps were subsequently fished in this vicinity with an increase in catch per unit effort of 53 to 60 lobsters per 100 trap lifts with up to 3 lobsters in some traps. Most of these lobsters were large 4 to 10 lbs or more and with few encrusting organisms. Large lobsters are not unknown in the bay,

in 1946 a lobster of 13 lbs 14 ozs was taken by hand from Cashel bay by J. Minchin.

Crawfish (Palinurus elephas) have only been recorded from the entrance to the bay where they have been taken by trap and trammel net. They have been observed while diving on open ground and shells recently damaged by crawfish were located at the edge of the laminarian zone. The largest crawfish seen from a single weeks catch by fishermen was about 5 lbs.

#### Mollusca

The scallop (Pecten maximus) is taken by dredge from the bay basin to its entrance (Figure 2) and their densities range from 2 to 3 per square yard to 1 per hundred square yards, within this area. The greatest concentration was found North of Inishtreh on the channel bottom and near rock outcrops in the centre of the bay (Figure 9). Isolated populations have been identified in channels and on some shallow banks at the head of the bay. Escallops are captured with a dredge from a powered boat, but on calm days escallops can be taken from shallow water with a bridleog, a long poled hand net. The escallops are visually located and are taken from those isolated populations at the head of the bay. They have also been picked at low water spring tides, particularly from the Cashel oyster bank.

Two species are hand picked, the winkle Littorina littorea and the Cluaisín Chlamys varia. The winkles are collected at low water, from underneath seaweed. Where the weed Ascophyllum nodosum, locally known as 'Asco', has been cut and removed, for subsequent processing at Kilkernan, the collecting of winkles is facilitated. Winkles are packed, stored and sold in sacks. The cluaisín is usually

byssally attached to rocks and shell debris and it is taken mainly from the Cashel Oyster bank. They are collected at lowest spring tides when this bank dries out, and up to six bags of cluaisíns can be taken at one tide. Usually two to five times a year they are picked depending on weather conditions, and this may constitute a total of half to one-and-a-half tons a year harvested. They are consumed locally.

Clauisíns are cooked in large pots of boiling water until the valves separate. The muscle usually parts from one of the valves at this time. The cluaisíns are taken out of the water and the muscle attachment on the other valve is removed with a knife. The viscera and gonads are discarded.

#### Unexploited Species

##### Crustacea

The edible crab, Cancer pagurus, is present within the bay in small numbers, only at one location they were numerous. To the north of Innishtreh (Figure 5) there is shallow water and adults were present in the bottom of holes in a slope of muddy sand, at an estimated density of one per two square yards.

##### Mollusca

The otter clam Lutraria sp. and the razorfish Ensis sp. were confined mainly to the entrance of the bay. Otter clams were seen most frequently in deep water. They have a scattered distribution of local concentrations which attain densities of up to 5 to 6 per square yard. Large quantities of its' shell are taken with scallop dredges. The razorfish were usually confined to either side of the slopes of the bay entrance and on a sand flat east of

Innishtreh (Figure 5). Estimated densities of up to 50 per square yard were recorded from 20 to 50 feet on the slopes. They had a distinctly clumped distribution.

Oyster shell has been found in the areas indicated on Figure 4 but a few live oysters have been taken from the Cashel oyster bank and from upper Cashel bay. In upper Cashel bay young spat were obtained and adults collected on 11/7/74 had ripe gonads. These oysters were found in the depressions of the shallow dunes (Figure 12) at densities up to four per square yard.

Other species noted were the Spider crab (Maia squinado); the smooth cockle (Laevicardium crassum); Desinia exoleta; Dog Cockle (Glycymeris glycymeris); The whelk (Buccinum undatum); venerid clams at the head of the bays, the most frequent were Venus verrucosa and Venerupis rhomboides particularly on the banks. The horse winkle (Monodonta lineata) was frequently seen locally in large numbers, 30 to 40 per square yard on the upper shore.

### Discussion

Escallops probably constitute the most important fishery within the bay and daily catches range from 8 to 16 dozen to 12 to 22 dozen for small and large boats respectively. The catch is dependent on the weather and tidal conditions because these effect dredge efficiency. After severe storms the catch can often improve. This may be due to the dislocation of escallops from beside rocks to open ground. The dredges collect large numbers of starfish and from a series of 30 commercial dredge hauls there was a ratio of starfish to escallops of 1:  $1\frac{1}{2}$ . The ratio of the starfish species captured in the dredge was 201 Common starfish (Asterias rubens); 32 Spiny starfish

Marthasterias glacialis); 5 Purple starfish (Henricia sanguinolenta) and 2 Luidia sarsi.

The common starfish is known to prey on escallops and some clean and hinged shells were found, but starfish may also feed on other more sedentary species in greater numbers such as otter clams which may explain the presence of large numbers of their shell taken in dredge hauls.

Crawfish have been observed under laboratory conditions to damage the shell of the scallop when consuming them by breaking the shell edge particularly at the anterior or posterior end. Damaged shell like this was found in 20 feet to 50 feet to the north of Innishtreh even though no live escallops were seen until depths of 80 feet were reached. The crawfish, however, were observed throughout this range.

The lobsters located from the centre of the bay were probably a previously unfished stock. The large size clearly indicated that there had been little or no fishing for them within this area. The yield is liable to be high initially but this will drop as the old stock is removed, allowing further lobsters to recruit into this area without competition.

The oyster banks might profitably be developed, although this can only be determined by pilot studies. Potentially the main predators, which find shelter among the coralline algae and shell debris, which also provides a site for settlement for clams etc, are the oyster drill, (Urosalpinx cinerea) the edible crab; the common shore crab, (Carcinus maenas) and portunid crabs. Oysters taken from the bank had numerous drill holes in their shells.

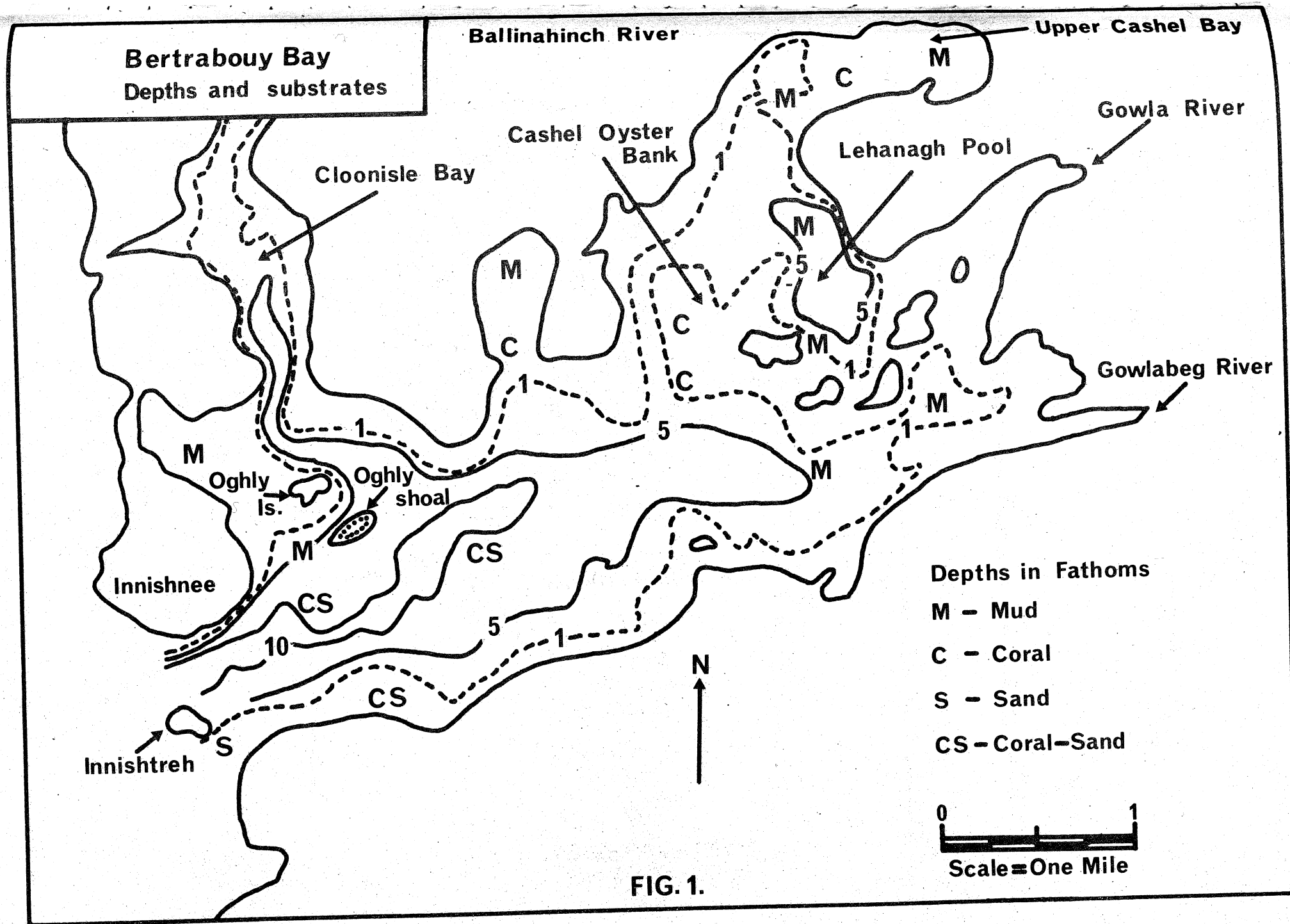


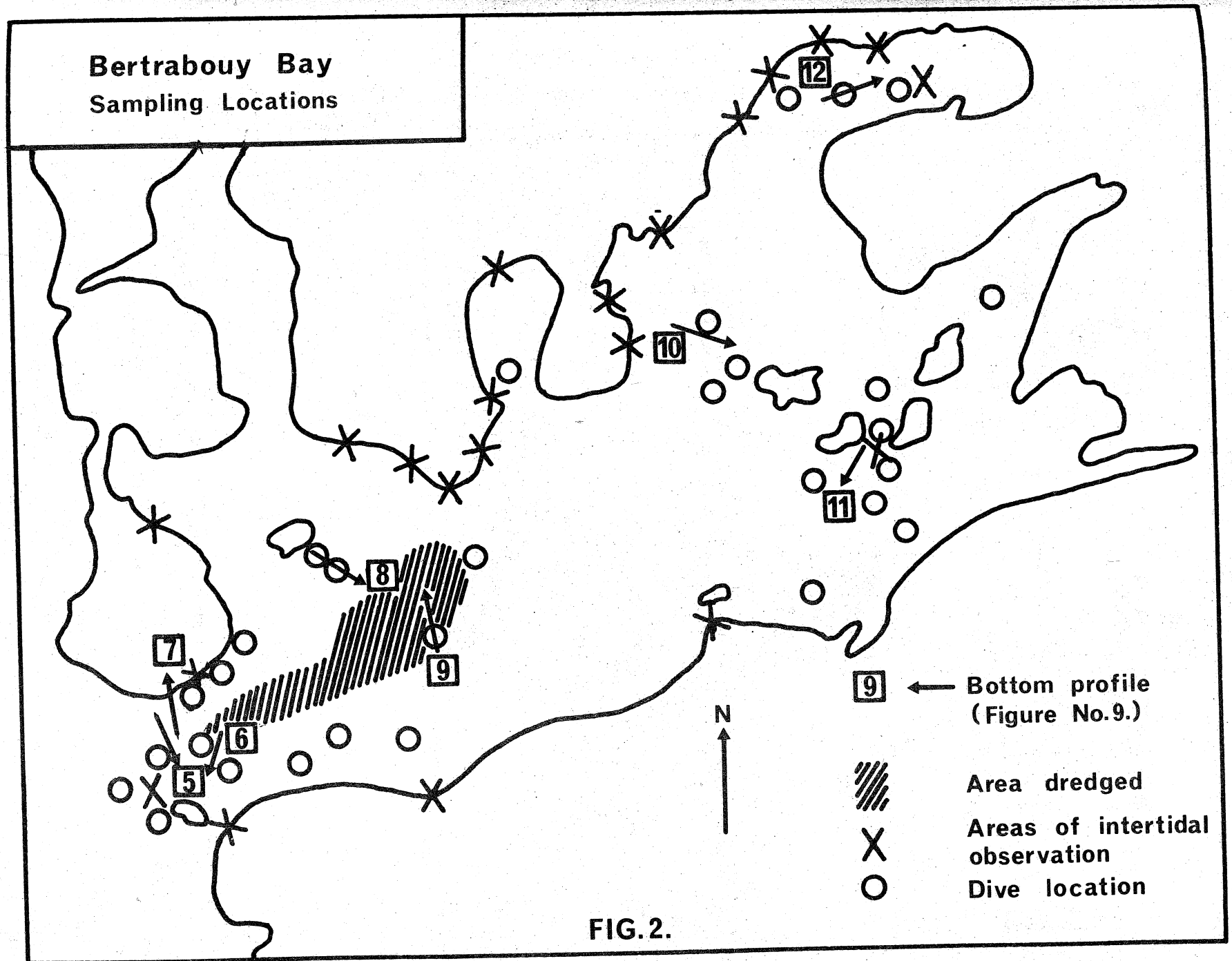
The razor-fish in the bay to the east of Innishtreh are present in shallow water and it might be profitable to investigate whether a portable shellfish harvester of the McPhail type could be useful for collecting them. The razorfish in deeper water along with otter elams would be difficult to harvest.

Few commercial fish were seen in the bay while diving. Those salmon which are not netted outside the bay pass through the bay to ascend the rivers. Some skate or large dogfish have been seen within the bay, notably adjacent to the Lehanagh pool. Mackerel are sometimes caught within the bay. Wrasse are frequent near rock outcrops particularly in deep water. Mackerel and Wrasse are locally salted, dried and stored for winter use.

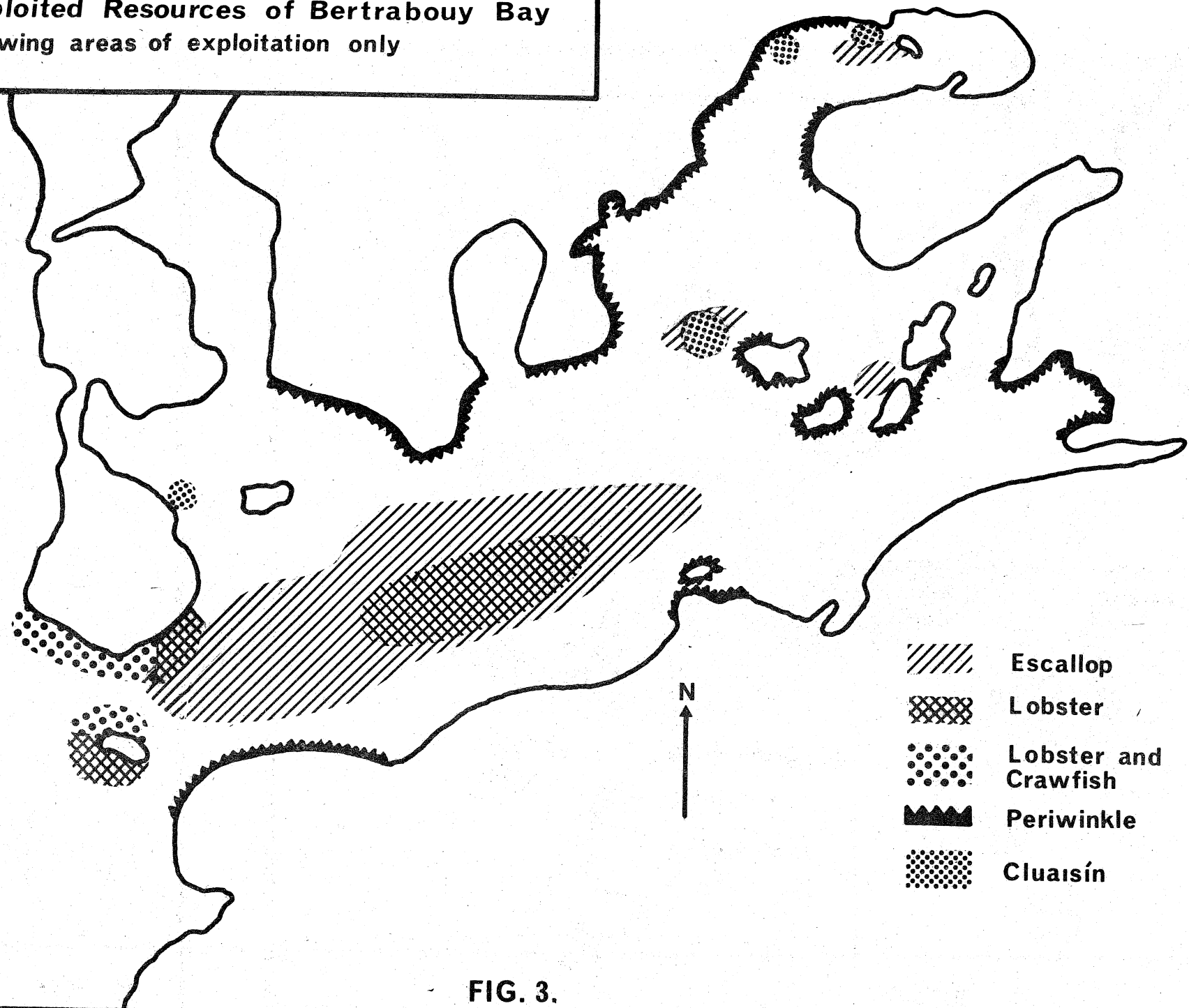
#### Acknowledgements

I would like to thank the following fishermen for their help in this study. Pádraig Barrett, Seán and Pádraig Jennings, Tom King, Mark Ridge and Patrick Broome. I would also like to thank Donal Manahan of Trinity College, Dublin who assisted in making these diving observations.





**Exploited Resources of Bertrabouy Bay**  
Showing areas of exploitation only



**FIG. 3.**

Distribution of important Invertebrates in  
Bertrabouy Bay. (For Crayfish and Winkles  
see Fig.3.)

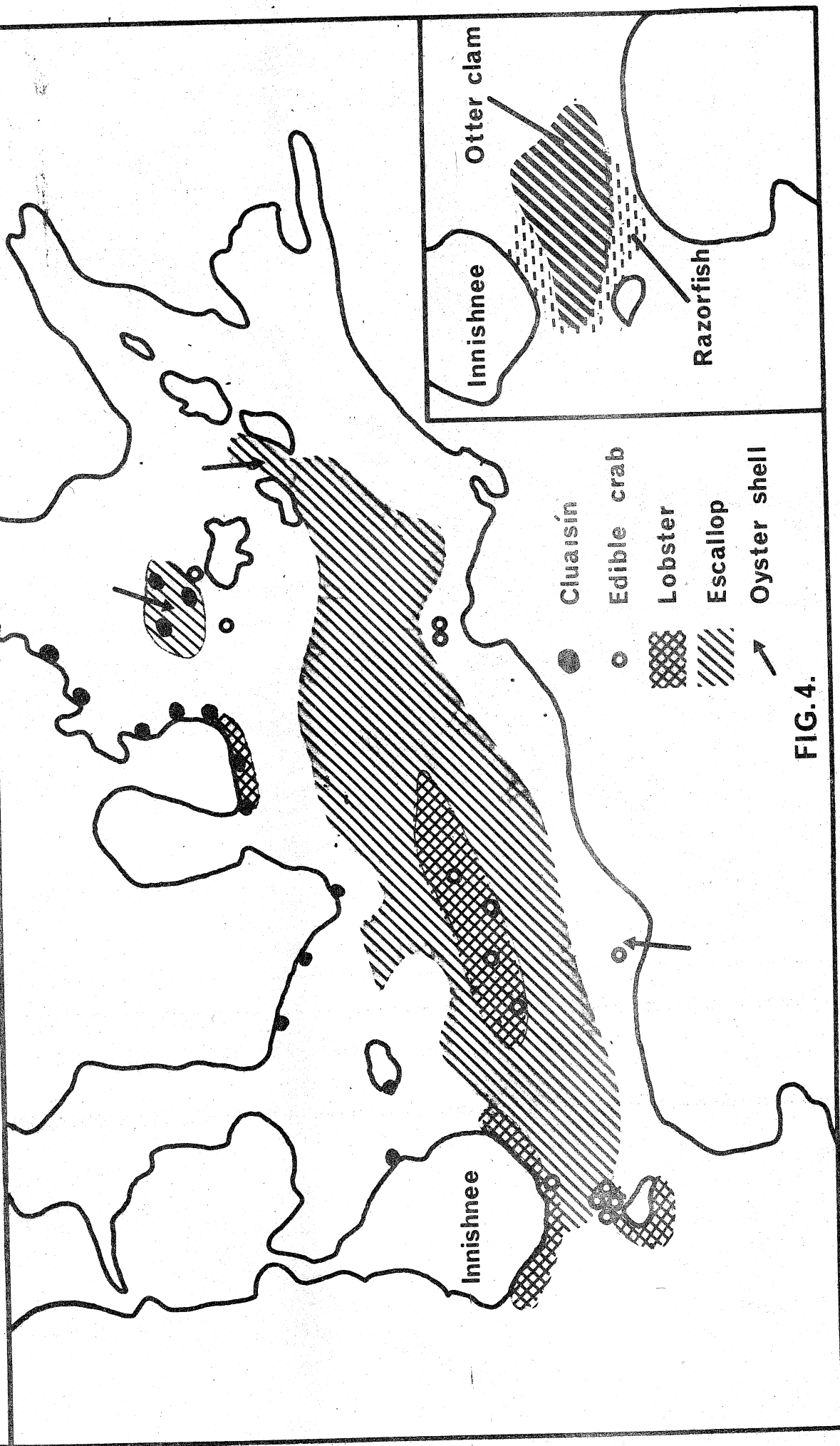


FIG.4.

scale in feet

# Bay entrance, North of Innishtreh.

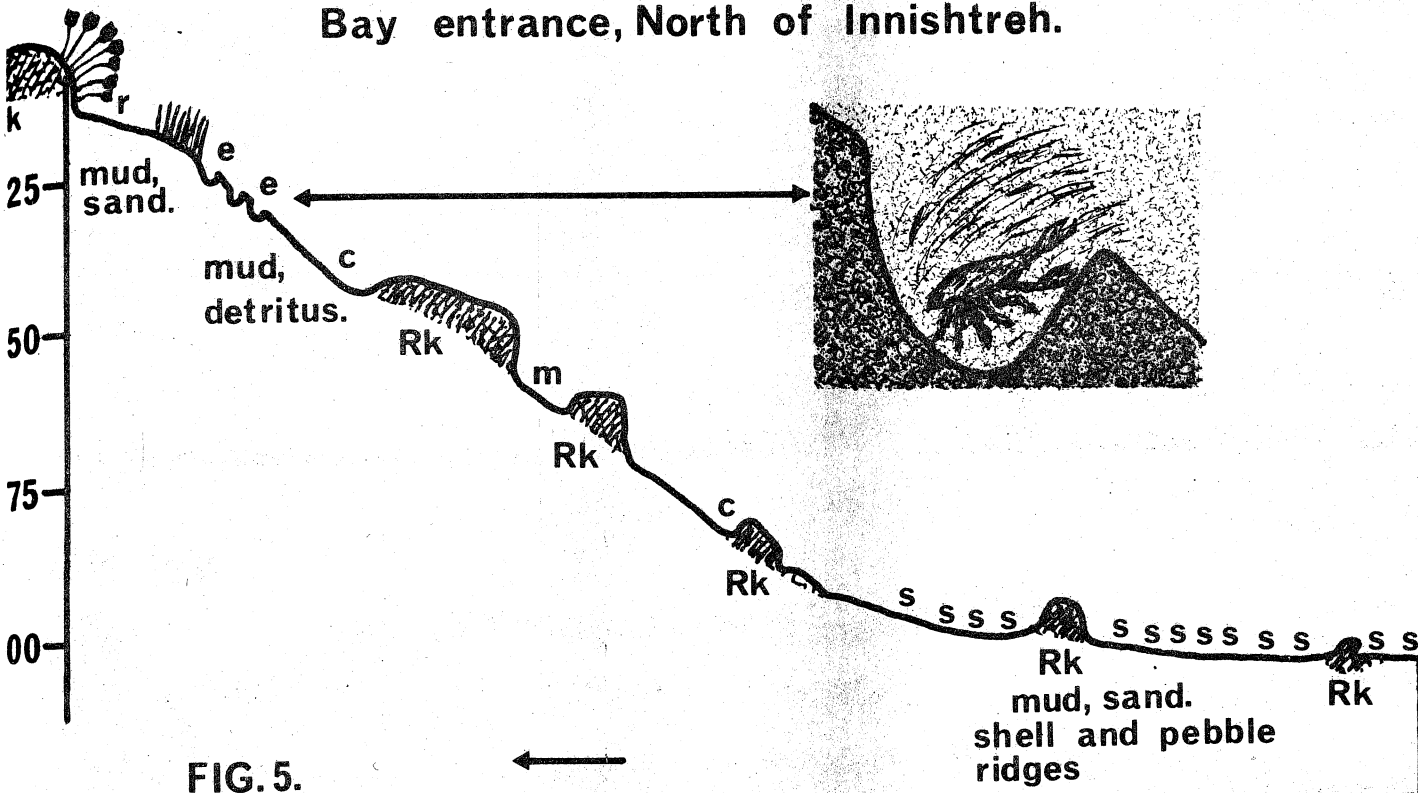


FIG. 5.

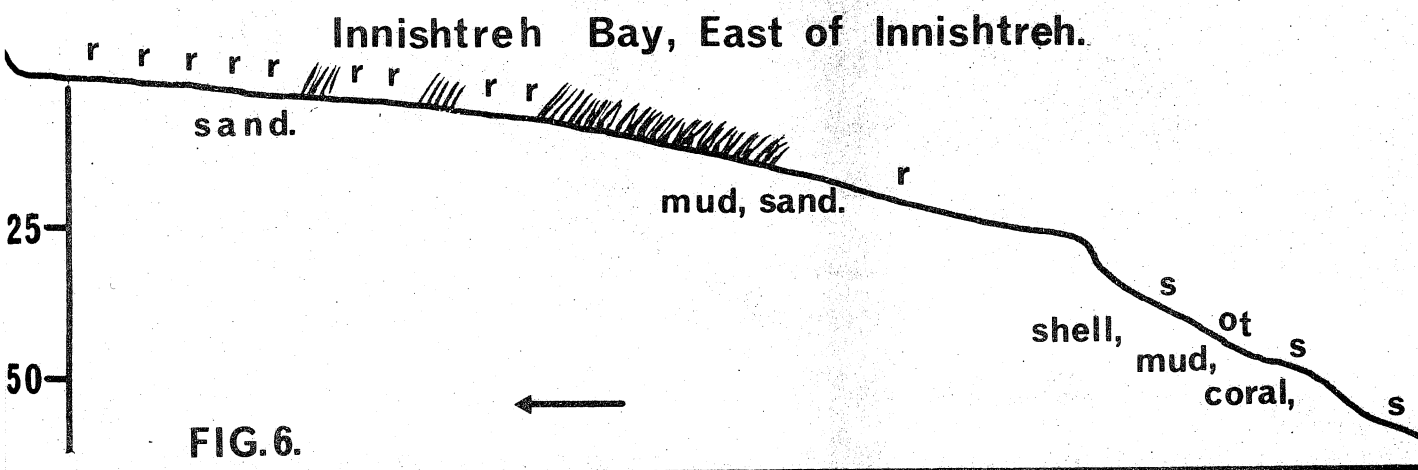


FIG. 6.

# Bay entrance, South of Innishnee.

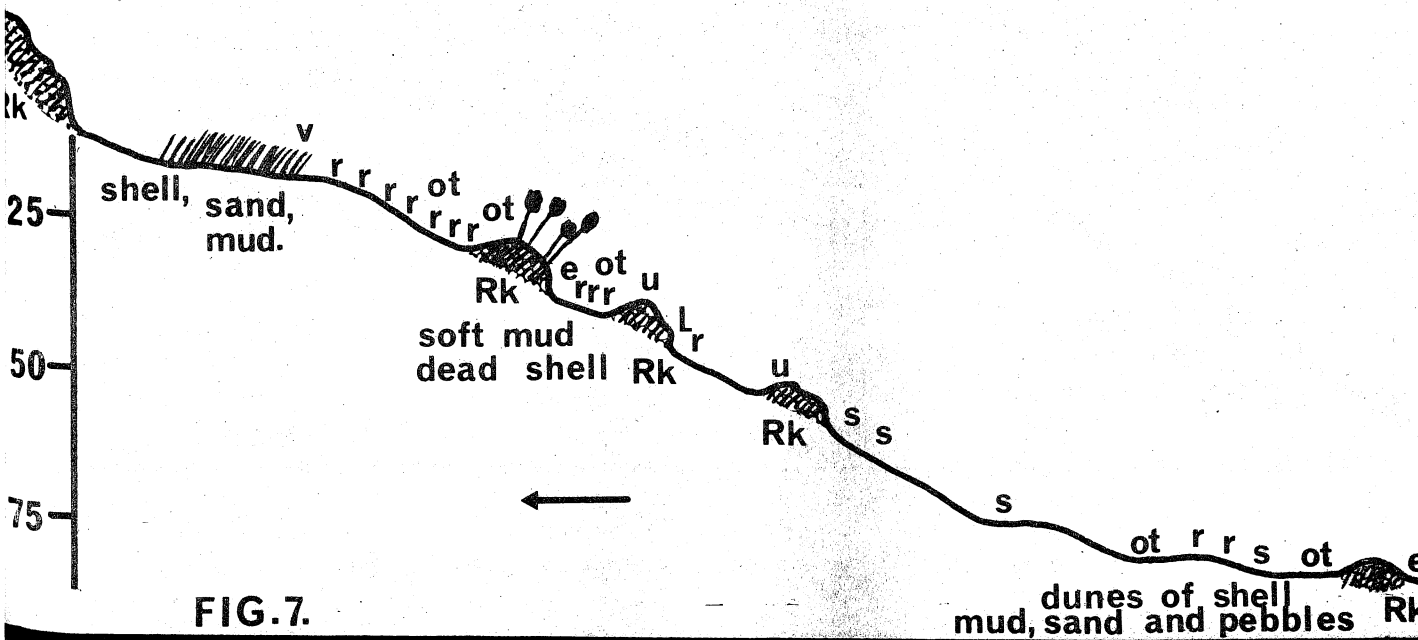
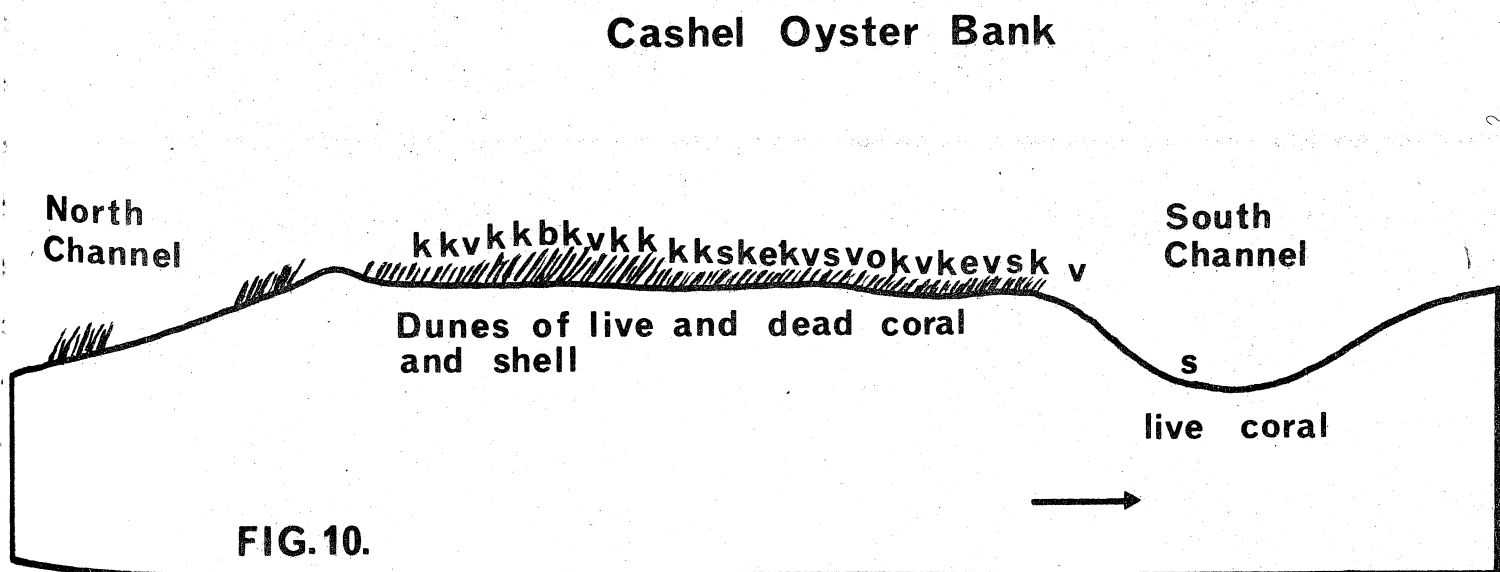
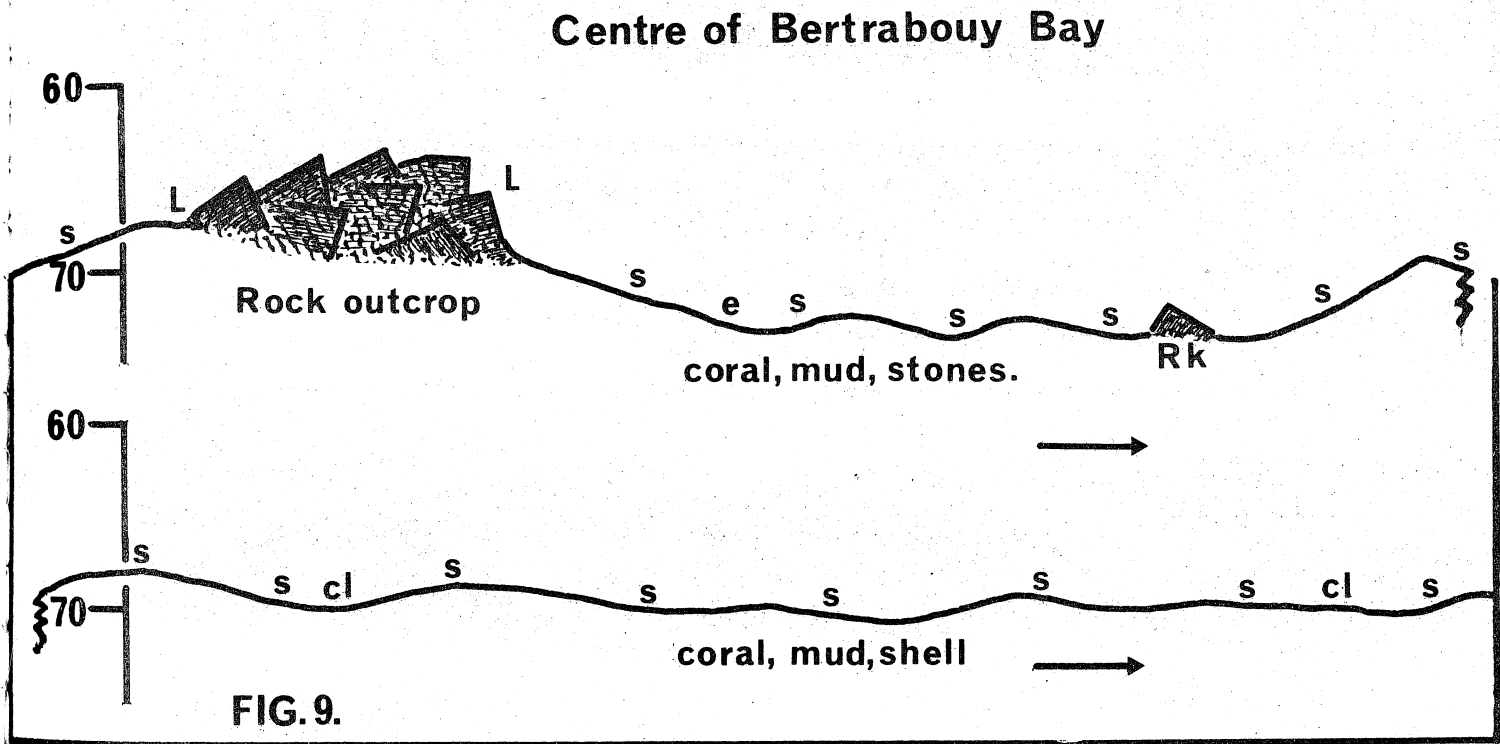
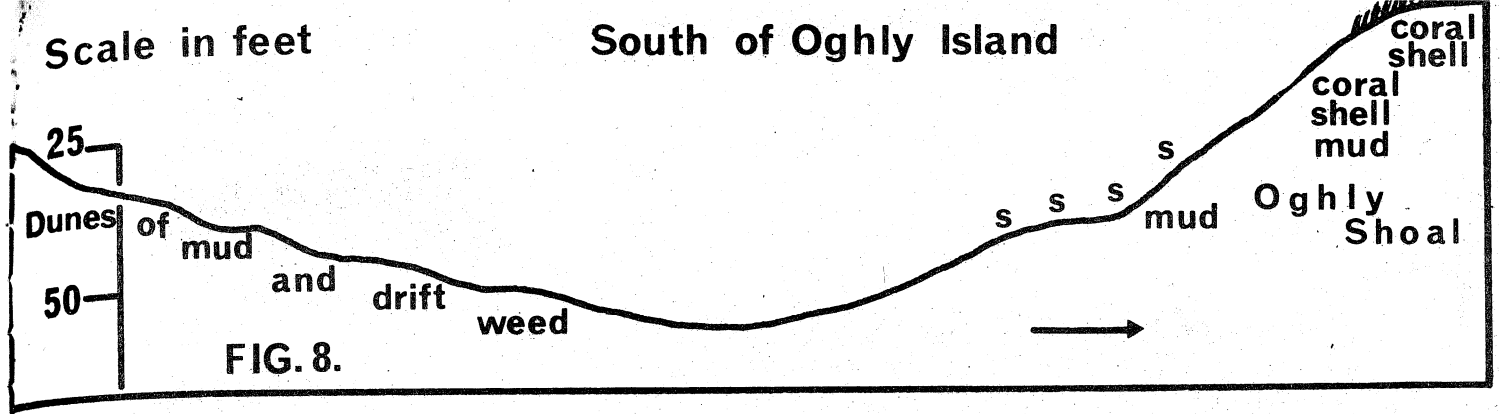
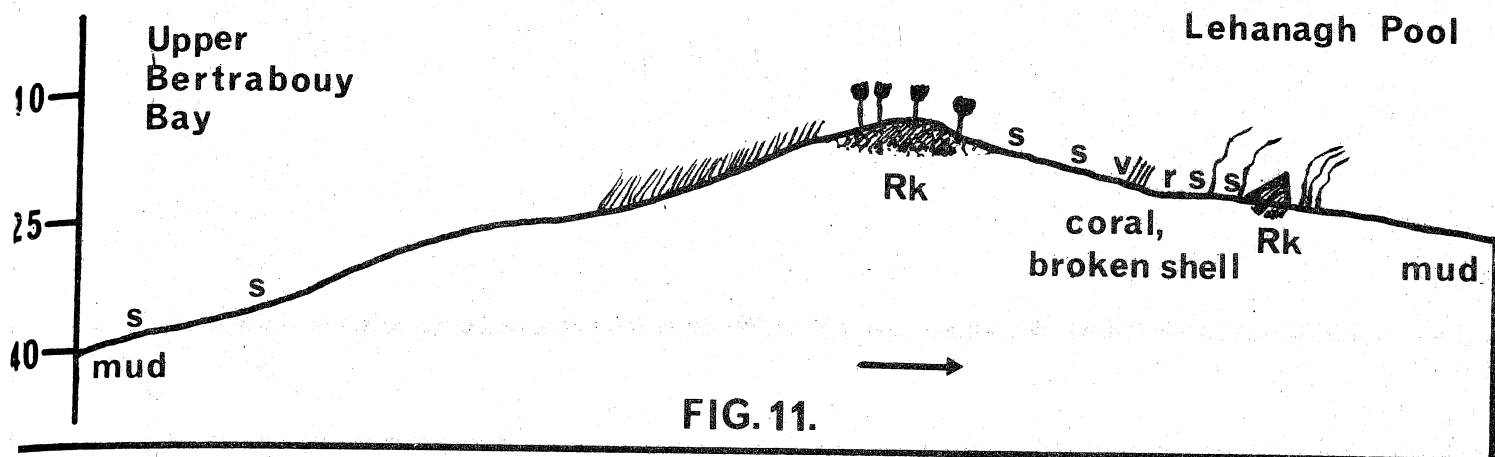


FIG. 7.

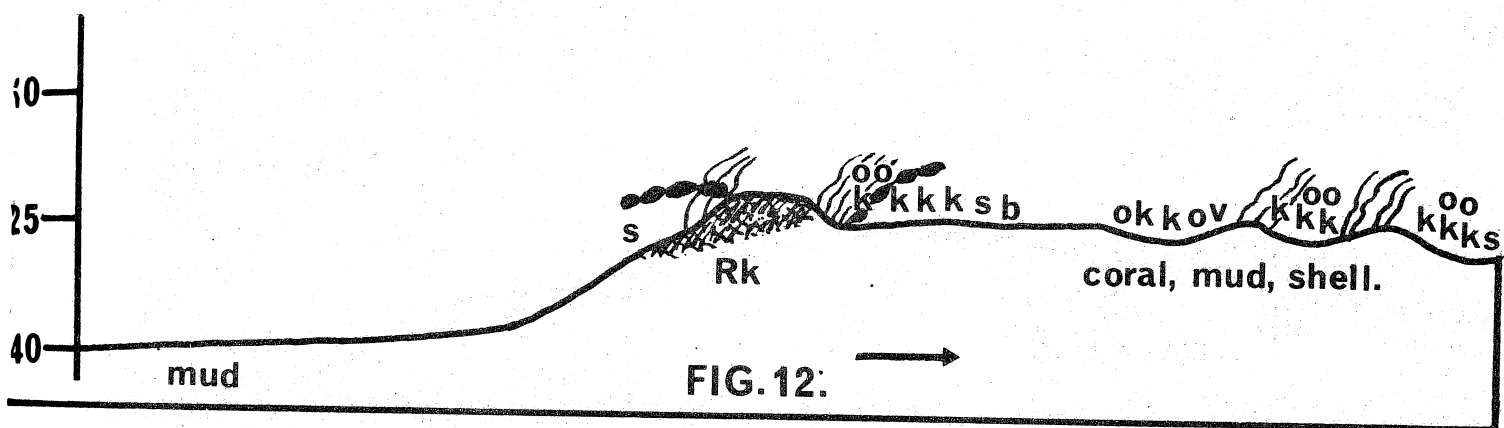


# Bertrabouy Bay

Scale in feet



# Upper Cashel Bay



## Key to Symbols used in Figures

- Zostera marina* • Eelgrass
- Chorda filum* • Bootlaceweed
- Laminaria saccharina* • Kelp
- Laminaria hypoborea* • Kelp
- b** - *Buccinum undatum* • Whelk
- c** - *Palanurus elephas* • Crawfish
- cl** - *Clinocardium* • Cockle
- e** - *Cancer pagurus* • Edible Crab
- k** - *Chlamys varia* • Cluaisín
- L** - *Homarus gammarus* • Lobster
- m** - *Maia squinado* • Spider Crab

- o** - *Ostrea edulis* • Oyster
- ot** - *Lutraria* sp. • Otter Shell
- r** - *Ensis* spp. • Razor Shell
- s** - *Pecten maximus* • Escallop
- u** - *Echinus esculentus* • Sea Urchin
- v** - *Venus* spp. • Venus Clam

**Rk** Rock

→ Transect direction