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A QUANTITATIVE EXAMINATION OF THE BENTHIC MOLLUSCS OF COCKBURN SOUND, WESTERN AUSTRALIA

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by

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ABSTRACT

Thirty stations in Cockburn Sound, Western Australia, were sampled in triplicate with a $0.1m^2$ Van Veen grab. Molluscs were the dominant organisms, constituting 72.19% of all individuals and 89.56% of the biomass. An area of high density and biomass figures was found in the mideastern portion of the deep basin of the Sound. Densities and biomasses outside this area were substantially lower. A comparison of the present results for the central basin with samples made 20 years ago showed no obvious changes which could be attributed to pollution. The seagrass Posidonia has disappeared from the eastern shelf in the last 20 years but the causes of this are unknown. This change has been reflected in the molluscs found on the eastern shelf. Two dominant molluscs, Musculista glaberrima and Dosinia incisa, are recommended for any environmental monitoring programme which might be conducted in Cockburn Sound in the future.

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INTRODUCTION

Cockburn Sound is the only large embayment along the 1300 km of coastline between Shark Bay and King George Sound. Because of its unique structure and its proximity to Perth Cockburn Sound has become important in a number of ways. The sheltered waters provide a safe area for boating and swimming. Sports fishing, diving and crabbing are also popular. Commercial fishing for food and bait fish is done in the Sound. In addition Cockburn Sound is a major nursery area for a number of commercial fish species (Chittleborough, 1970). The largest concentration of industry in Western Australia occurs along the eastern shore of Cockburn Sound. Among the industries are refineries for oil, nickel, and alumina, two power stations, a steel mill and blast furnace, meatworks, and a number of other industries. Port facilities have been built to service these industries. A recent development has been the construction of a major naval base on the Cockburn Sound side of Garden Island. The first stage of this was the construction in the early 1970's of a bridge and causeway linking Garden Island with Pt. Peron on the mainland. Later construction of the naval facilities was begun. Several mining claims have been staked within the Sound itself for limestone and lime sands; at present only those on Success and Parmelia Banks are being mined.

The increasing usage of Cockburn Sound by a variety of interests has led to concern over the effects of the usage on the ecology of the Sound (Chittleborough, 1970; Crook, 1971). Chittleborough (1970) remarked that pollution data for Cockburn Sound was then sparse, but several main concerns were noted. In 1970 a total of 55 million litres of water was removed hourly from the Sound for use as a coolant. This has now risen to 67 million litres per hour. The water is returned at an average of $9^{o}C$ above the ambient temperature. A fertilizer plant releases 318 metric tons of calcium sulfate into the basin at a depth of 15.5 m every day. As early as 1970 the flavour of fish and mussels taken from the Sound was tainted by oil (Chittleborough, 1970). Ecological and hydrological studies carried out by consultants from 1970 to 1975 have been reviewed by Scott (1976). Recently concern was expressed over the high levels of cadmium found in mussels (West Australian, 1978). Much of the seagrass on the eastern shelf of Cockburn Sound has disappeared. Concern over the problems of the multiple usage of the Sound led the Environmental Protection Authority in 1976 to form the Cockburn Sound Study Group to conduct a three year examination of the usage of the Sound.

Cockburn Sound has a diverse marine flora and fauna and a high level of productivity (Chittleborough, 1970; Wilson, Kendrick and Brearley, 1978). The area has an interesting combination of tropical and temperate species. The rich marine biota has prompted a number of studies (Smith, 1952; Davies, 1963; Phillips et. al., 1963; A.C. Jones, 1966; R. Jones, 1966; Nunn, 1966; Meagher, 1966; Wilson and Hodgkin, 1967; Lenanton, 1974; Penn, 1975). A major examination of the benthic fauna of Cockburn Sound was undertaken by the Western Australian Naturalists Club in 1956. The entire Sound was divided into a grid system and each area was sampled qualitatively by a combination of dredging and scuba diving. Field work was completed but the material was never published. At the request of the Cockburn Sound Study Group reports on the molluscs (Wilson, Kendrick and Brearley 1978) and echinoderms (Marsh and Devaney, 1978) and corals (Marsh, 1978) were prepared.

Two objectives form the basis of the present investigation. In view of the increasing industrial usage of the Sound and the increased pollution levels over the last 20 years a comparison of the present molluscan fauna with the earlier survey is desirable. The second objective is to provide quantitative data on the current status of molluscs in Cockburn Sound to allow further comparisons to be made in the future. To some extent these objectives are mutually exclusive. The Naturalist Club project was accomplished with volunteers over a 4 year period. The techniques used provided a comprehensive qualitative list of the molluscan fauna of Cockburn Sound. It was impossible to duplicate the extensive effort of the Naturalist Club in this survey. Instead a programme of limited sampling with a quantitative grab was developed. This allows some comparisons with the Naturalist Club data and at the same time provides quantitative data for future workers.

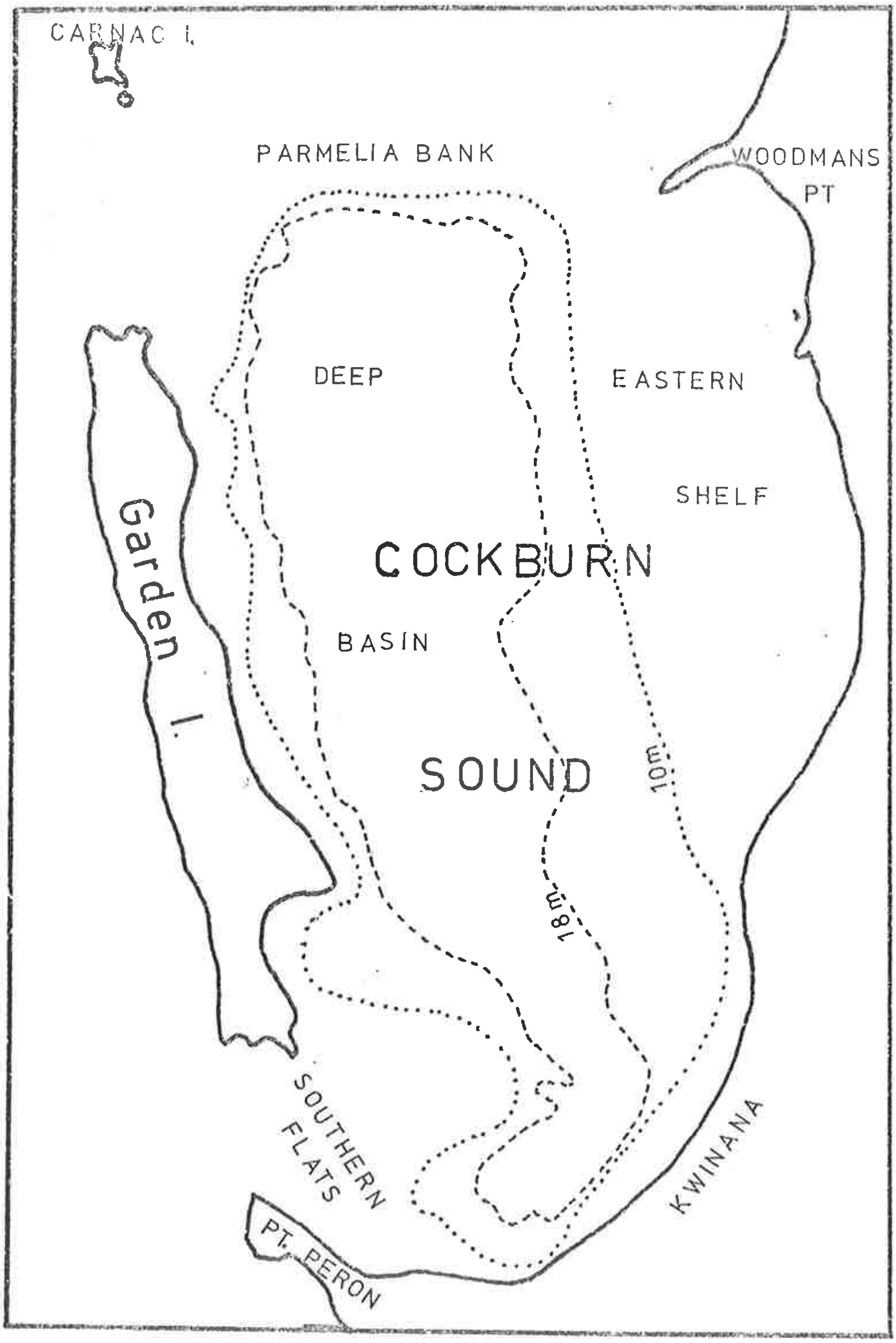
PHYSIOGRAPHY

Cockburn Sound is a large marine lagoon with an area of approximately 130 km^2 located on the west coast of Western Australia at $32^{0}12'$S and $115^{0}43'$E. The Sound is bordered on the east by the Australian mainland. Pt. Peron forms the southern boundary, Garden Island and Carnac Island the western border, and Parmelia Bank the northern extent (Figure 1). The margins of Cockburn Sound are primarily sandy beaches with a few rocky outcrops of aeolianite limestone.

The main feature of Cockburn Sound is the central basin, which has a uniform depth of 18 to 21 m. The basin has a sedimentary layer of fine grained sediments with a calcium carbonate content of 65 to 83% (Davies, 1963). The 5 m of sediment has accumulated over the 5,000 years since Cockburn Sound was flooded by rising sea levels. Nunn (1966) commented on the high organic content of the sediments: 50% of the bottom material was fecal pellets, 40% sediment and 10% was a combination of living and dead foraminiferan tests, the exoskeletons of molluscs and echinoderms, and plant detritus. The deep basin slopes rapidly upwards on its western border with Garden Island and on its southern end to the Southern Flats. A shallow shelf of 10 m depth lies to the east of the central basin. The shelf slopes gradually to the shoreline to the east. The eastern shelf is primarily sand though there are a few coral outcrops (Chittleborough, 1970; Wilson, Kendrick and Brearley, 1978).

Two sills restrict the movement of water into and out of Cockburn Sound. Parmelia Bank on the north has a depth of 5 to 6 m. A ship channel has been cut through the bank and is dredged to a depth of 14.5 m. The Southern Flats have a depth

Figure 1. Physical features of Cockburn Sound, Western Australia


CARNAC I.
PARMELIA BANK
WOODMANS PT
DEEP
EASTERN
SHELF
COCKBURN
BASIN
SOUND
Garden I.
10m
18m
SOUTHERN FLATS
PT. PERON
KWINANA

of up to 4 m. Both sills are composed of unconsolidated sand. The Southern Flat is built up by currents and wave action which bring material through the southern passage between Pt. Peron and Garden Island (Nunn, 1966). The effects of the bridge and causeway recently built in this area are unknown.

The internal circulation within Cockburn Sound is poorly known. There are no surface freshwater inflows into the Sound, though there is some subsurface seepage (Chittleborough, 1970). Nunn (1966) reported some flow both into and out of Cockburn Sound through the Southern Flats. Tides in the area outside Cockburn Sound have a maximum daily amplitude of 1 m and an annual extreme range of 1.7 m (Hodgkin and DiLollo, 1958), but tidal variation within the Sound itself is less. The mean surface water temperature in the summer is 22.6^{o}C and in the winter it is 15.7^{o}C (Chittleborough, 1970).

Habitats within the Sound were divided into five categories by Chittleborough (1970) and Wilson, Kendrick and Brearley (1978): open sand, the eastern shelf, seagrass community, reefs and the central basin. Reefs of living and dead coral heads of Turbinaria danae occur along the drop off zone between the eastern shelf and the central basin. These are restricted to a few metres in diameter at the most. The seagrass community is dominated by two species of Posidonia; P. australis and an unnamed species 'Cambridge, (pers. comm.). Smaller amounts of Amphibolus antarctica, Zostera muelleri, and Halophila ovula are also present. The largest beds of seagrass are on Parmelia Bank and the Southern Flats; Posidonia was formerly found on the eastern shelf but has died out. The seagrass community is the most important community in Cockburn Sound, with most other organisms being either directly or indirectly dependent on it (Chittleborough, 1970; Wilson, Kendrick and Brearley, 1978). However, in terms of area the central basin is 60% of Cockburn Sound and the eastern shelf 26%. The *Posidonia* flats on Parmelia Bank and the Southern Flats occupy only 10% of the area of Cockburn Sound.

MATERIALS AND METHODS

The Naturalist Club survey divided Cockburn Sound into a grid of 178 squares 0.9 km on a side (Wilson, Kendrick and Brearley, 1978) (Figure 2). In the present study 30 of the stations were selected for sampling with a table of random numbers. The stations selected are shown on Figure 3. Each of the selected stations were sampled at the center of the square with a $0.1m^2$ Van Veen grab during the period of 27 February to 1 March 1978. The grab was operated from a 10 m motor launch, the M.V. Henrietta. Stations were located by triangulation from prominent features on the shoreline. Four replicate samples were made at the initial stations (16, 17, 21 and 27) but the number of samples was reduced to 3 for later stations because of the quantity of material being collected. The bottom at stations 16, 17, 85 and 157 was covered with beds of seagrass Posidonia australis. The Van Veen grab did not function well in the seagrass beds, and data from these stations are only approximate. The bottom at the remaining stations was either sand or mud and the grab functioned with a high degree of effectiveness. The sampler was completely filled with 20 l sediment on the majority of the hauls made in sand or mud bottoms.

A sediment sample of about 300 ml was removed from the first sample collected at each station prior to sieving. The sediment samples were frozen at the end of each day and remained frozen until they were analyzed. After the samples were thawed organic material was removed by heating the sediment to $50^{o}C$ and adding hydrogen peroxide as described by Newell (1962). The samples were stored at 50^{o} overnight.

Figure 2. Grid system established by the Western Australian Naturalists Club for their survey of Cockburn Sound, Western Australia, conducted between 1956 and 1960.

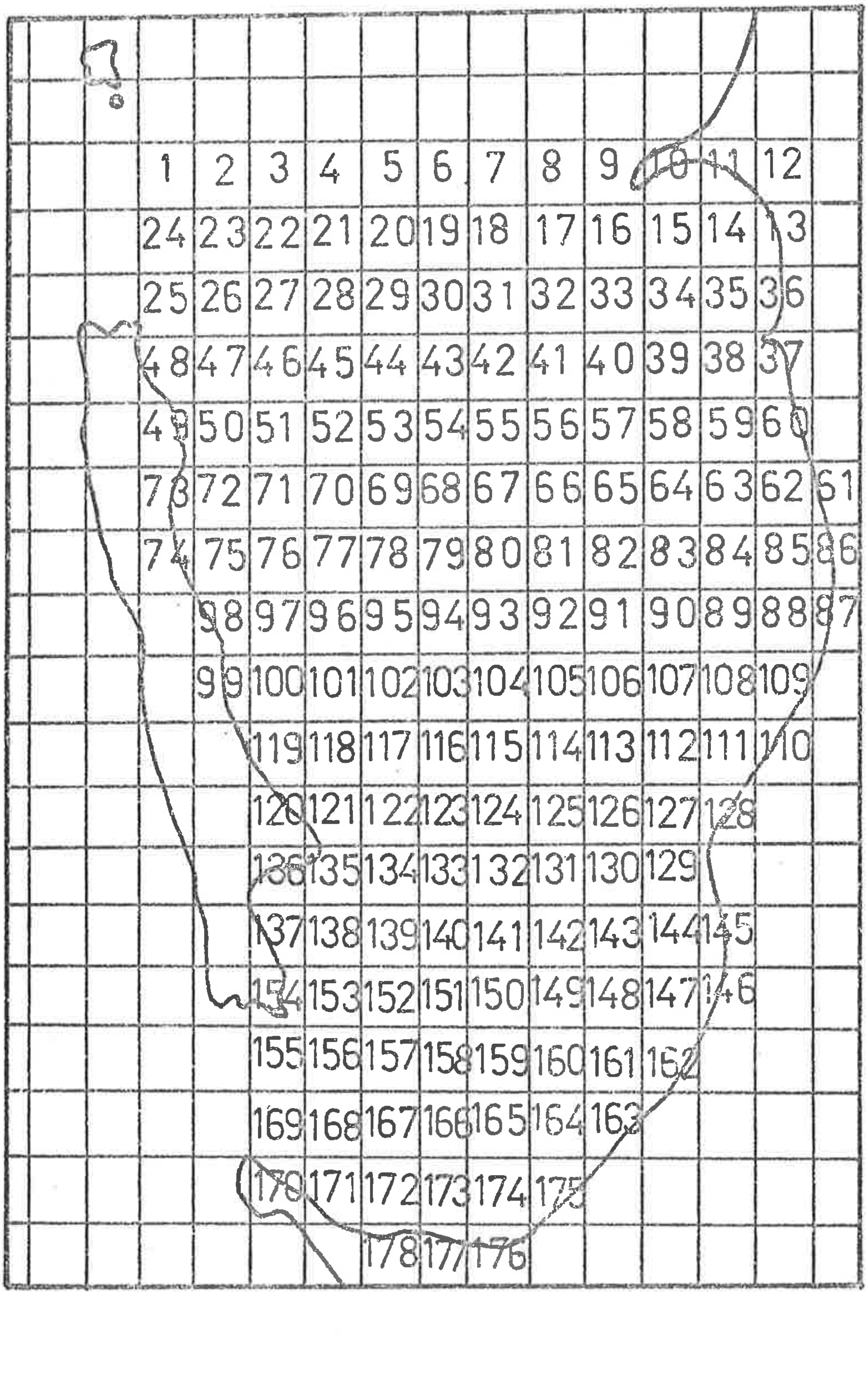
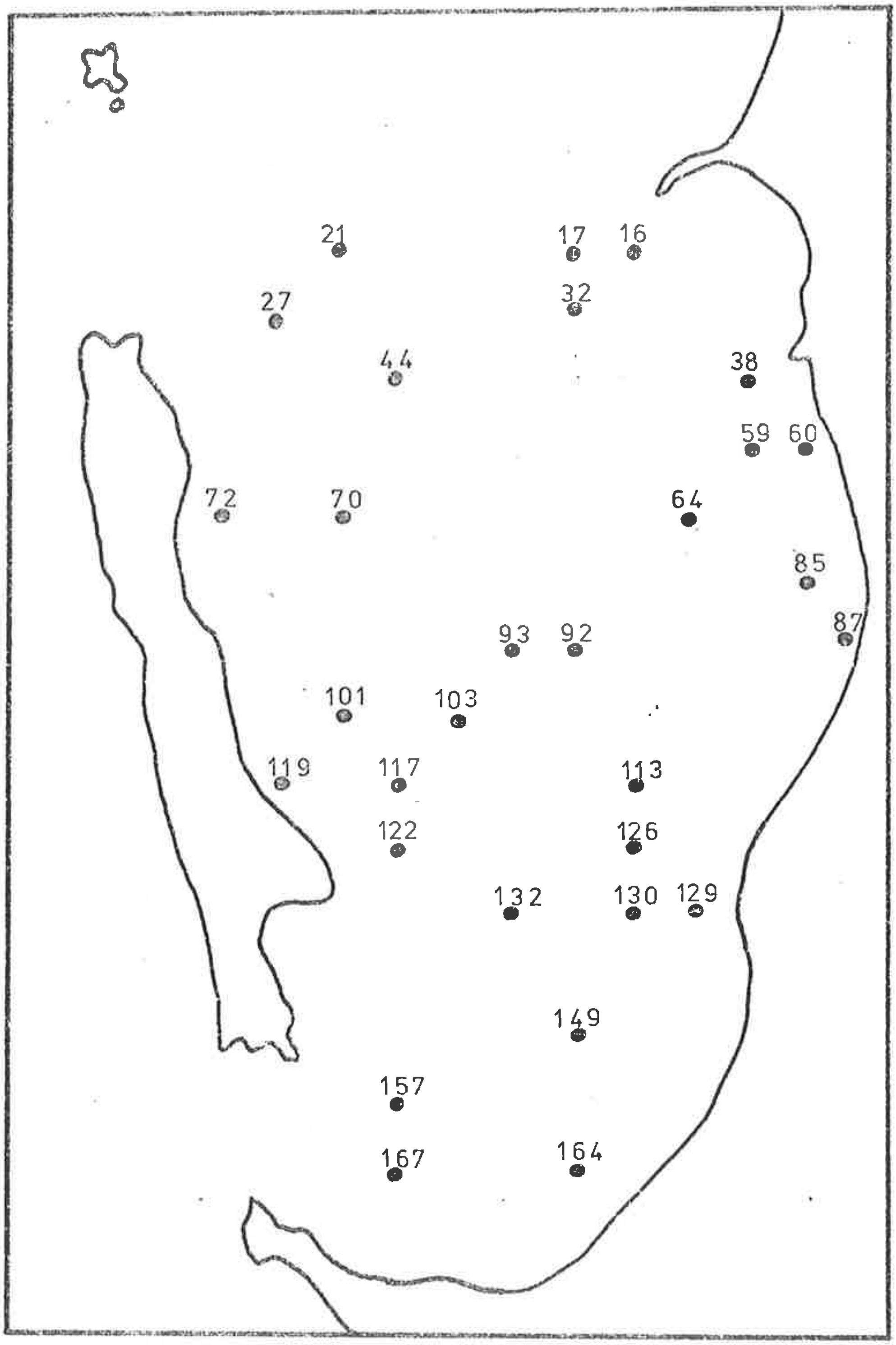

1 2 3 4 5 6 7 8 9 10 11 12
24 23 22 21 20 19 18 17 16 15 14 13
25 26 27 28 29 30 31 32 33 34 35 36
48 47 46 45 44 43 42 41 40 39 38 37
49 50 51 52 53 54 55 56 57 58 59 60
73 72 71 70 69 68 67 66 65 64 63 62 61
74 75 76 77 78 79 80 81 82 83 84 85 86
98 97 96 95 94 93 92 91 90 89 88 87
99 100 101 102 103 104 105 106 107 108 109
119 118 117 116 115 114 113 112 111 110
120 121 122 123 124 125 126 127 128
136 135 134 133 132 131 130 129
137 138 139 140 141 142 143 144 145
154 153 152 151 150 149 148 147 146
155 156 157 158 159 160 161 162
169 168 167 166 165 164 163
170 171 172 173 174 175
178 177 176

Figure 3. Stations sampled with a Van Veen grab in Cockburn Sound, Western Australia, during February and March 1978.



21
17
16
27
32
44
38
59
60
72
70
64
85
87
93
92
101
103
119
117
113
122
126
132
130
129
149
157
167
164

Addition of hydrogen peroxide the following morning produced no further reaction. The samples were wet sieved through a series of graded screens with mesh apertures of 1000, 500, 250, 125 and 63μm. After the sediment had settled the excess water was decanted from each fraction, and the fractions were stored for 3 to 4 days at 80°C until they were completely dried. Each fraction was weighed separately and the weights for each station were converted to Ø values on the Udder-Wentworth scale. The highest value of 5 is assigned to the fraction less than 63μm and the lowest value of 1 is assigned to the fraction which passes through the 1000μm sieve but is retained on the 500μm sieve. Complete details of the weights of each fraction at each station are listed on Appendix 1.

After the 300 ml sediment sample was removed through the top of the Van Veen grab the remainder of the sample was sieved through a 1.7 mm mesh. Samples were sieved on board the M.V. Henrietta as they were collected. All material retained on the sieve was preserved in 10% formalin buffered with borax. The samples were transferred to freshwater in the laboratory and sorted. All individuals that had been collected live were retained and stored in 70% alcohol. Individuals were sorted to species as completely as possible and counted. Specimens were blotted dry with paper towels and weighed to the nearest 0.1 gm. Bivalve mollusc shells were broken open, the animal was blotted dry, and both animal and shell fragments were weighed together. Shell lengths of the two most common species were measured to the nearest 0.1 mm with calipers.

RESULTS

Distribution of all phyla

One hundred thirty-eight species belonging to 8 phyla were collected during the investigation. A complete list of the mean density and biomass of each species at each of the 30 sampling sites is given in Appendix 2. The Van Veen grab is most effective at sampling small, sessile invertebrates. Mobile organisms such as fish and crabs are able to avoid the sampler. Larger invertebrates such as sea urchins and starfish are too rare to be effectively sampled. Large polychaetes are able to withdraw deeply into their tubes and avoid capture. A number of large polychaete tubes had been cut by the Van Veen grab as it closed, and the worms were not collected. These limitations on the sampling programme should be considered in the discussion which follows.

Taxa were identified as completely as possible. Most identifications are at least to generic level, and in many cases specific determinations could be made. The most important exception was the polychaete worms which were identified only to family. The number of species recorded for polychaetes is reasonably accurate as are the data on the number of individuals and biomass at each station. Several polychaetes were fragmented by the sampling procedure; only heads were counted.

Molluscs dominated the study. They constituted 72.19% of all individuals collected (Table 1) and 89.56% of the biomass. The dominance of molluscs can be attributed to bivalves, which alone comprised 71.30% of the total numbers and 85.18% of the total biomass collected. Amphineurans and gastropods were minor elements of the molluscan fauna; no cephalopods or scaphopods were collected. Coelenterates and echinoderms were

Table 1. Phyla collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

Phylum	No. of species	Percentage of total number of individuals	Percentage of total net weight
Annelida, Class Polychaeta	63	0.68	9.26
Arthropoda, Class Crustacea	21	0.94	10.77
Chordata, Subphylum Tunicata	5	0.85	0.60
Chordata, Class Osteichthyes	1	0.02	0.04
Coelenterata	4	4.50	3.81
Echinodermata	7	3.14	2.56
Mollusca	34	89.56	72.19
Nemertea	1	0.33	0.73
Sipunculida	2	0.11	0.07
TOTAL	138	100.13	100.03

the second and third most important groups in terms of numbers but crustaceans and polychaetes were second and third in biomass. Thus there was no group which was clearly second in importance. Because of the predominance of molluscs the discussion which follows will deal largely with that group.

Figures 4 and 5 show the mean density and biomass of all organisms collected at each of the 30 sampling sites. Low densities of animals were found in most stations in the northern area of Cockburn Sound (Figure 4), along the western side, and in the southern end of the Sound. Densities in these areas ranged from a low of $10/m^2$ at Station 72 to a maximum of $377/m^2$ at Station 87; most of the stations had densities of $200/m^2$ or less. Only stations 60, 87 and 164 were above that level. An area of high density was found in the mideastern portion of Cockburn Sound. This area encompasses Stations 92, 93, 113, 126, 129, 130 and 149. Animal densities in this region ranged from a low of $417/m^2$ at Station 130 to a high of $1897/m^2$ at the adjacent sampling site, Station 129. The map of biomass for all taxa collected (Figure 5) shows a similar high biomass for the mideastern sector of Cockburn Sound. Biomass figures at stations outside the mideastern region ranged from 0.1 gm/m^2 at Station 72 to 341 gm/m^2 at Station 60. The area of high biomass extends further west than the area of high density, and includes Stations 103, 117, 122 and 132. Wet weights in the mideastern region ranged from 347 gm/m^2 at Station 132 to 2107 gm/m^2 at Station 126.

Distributions of molluscs

Similar patterns are shown by the data for the molluscs collected. The density of all molluscs is shown on Figure 6. Low values of $3.3/m^2$ to $330.3/m^2$ were found at most stations

Figure 4. Density of individuals (no./m^2) of all phyla collected in Van Veen grab samples made in Cockburn Sound, Western Australia, during February and March 1978.

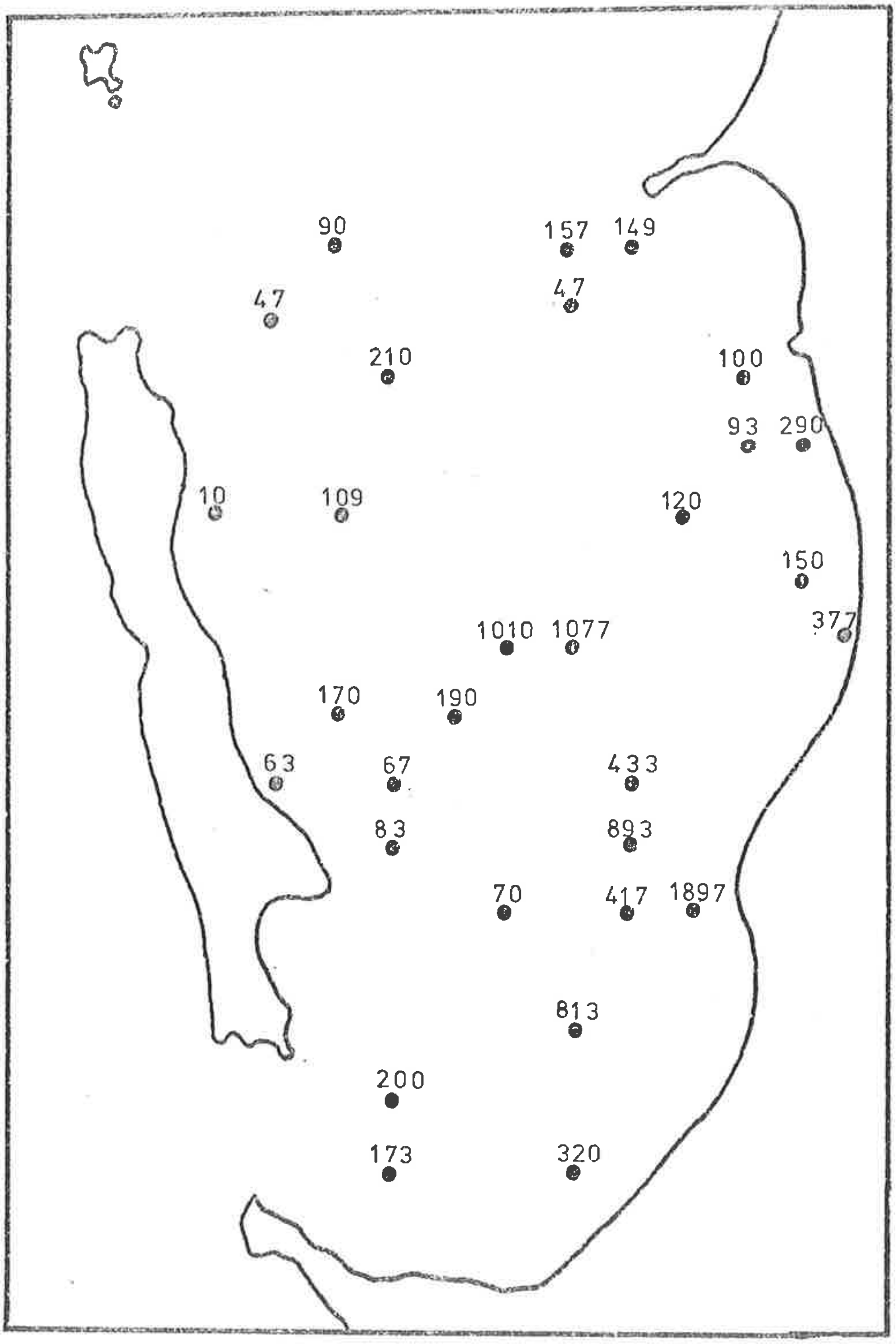

90
157
149
47
47
210
100
93
290
10
109
120
150
1010
1077
377
170
190
63
67
433
83
893
70
417
1897
813
200
173
320

Figure 5. Total biomass (gm./m^2) of all phyla collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

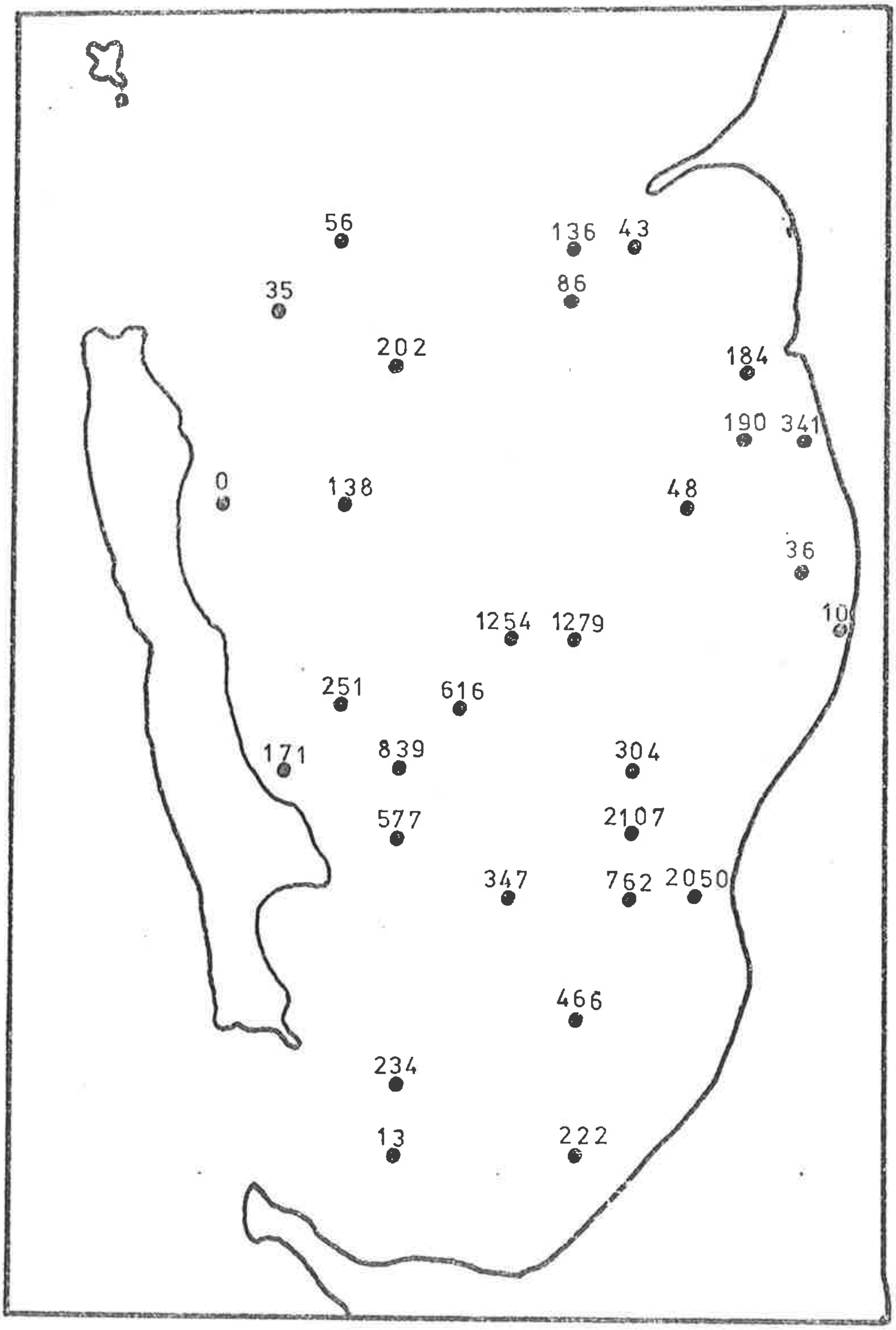

56
136
43
35
86
202
184
190
341
0
138
48
36
10
1254
1279
251
616
171
839
304
577
2107
347
762
2050
466
234
13
222

Figure 6. Density of molluscs (no./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

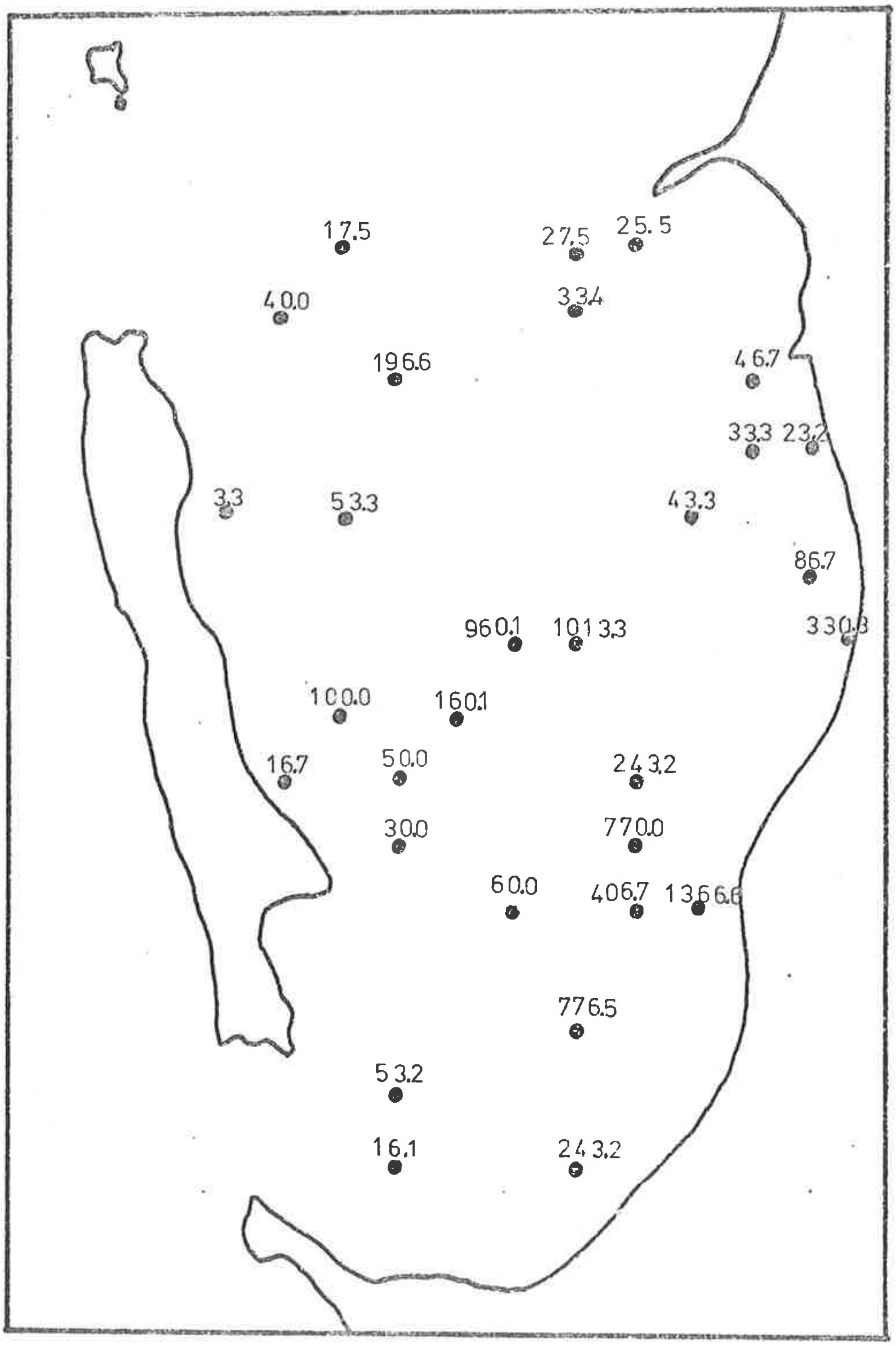
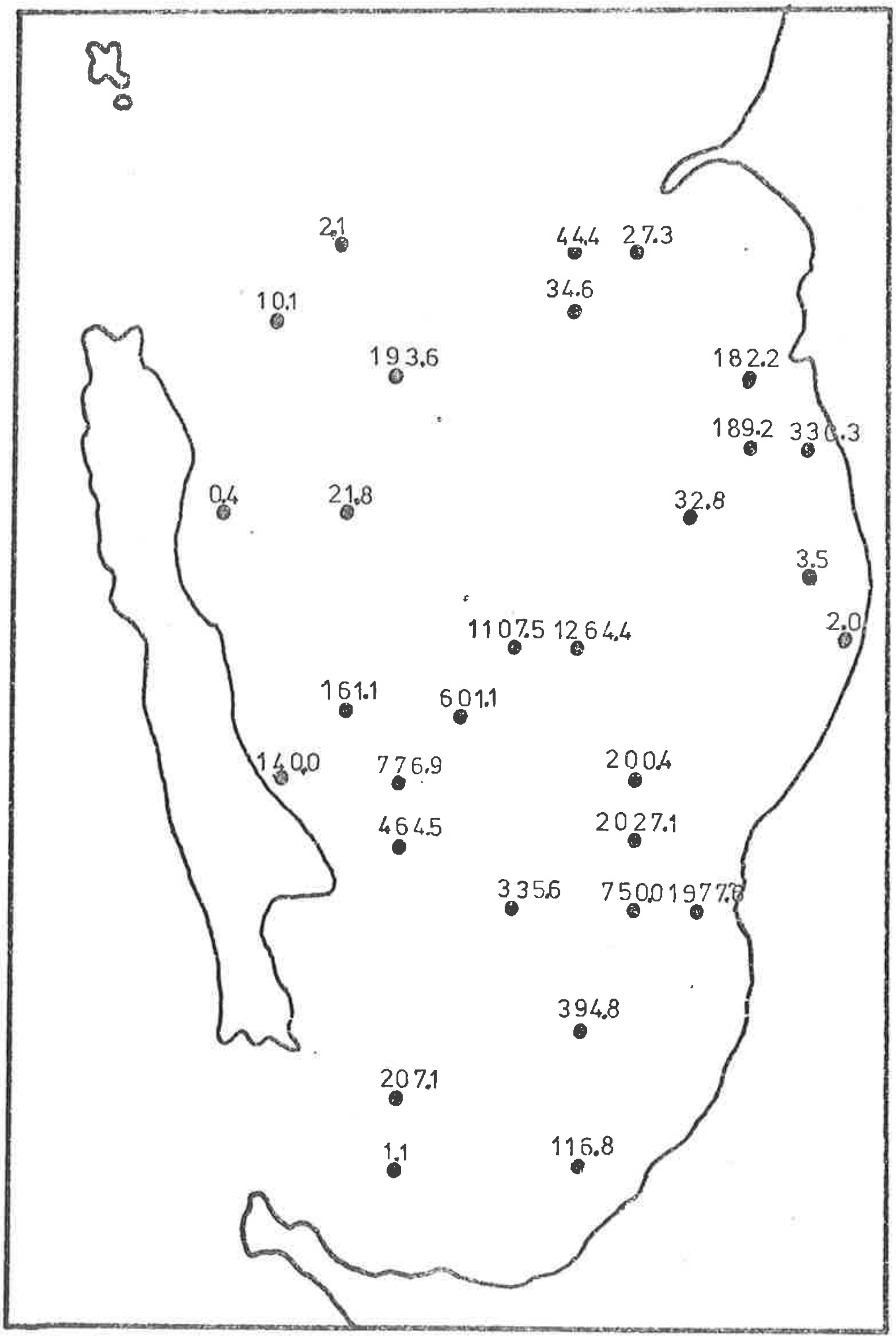

17.5
27.5
25.5
40.0
33.4
196.6
46.7
33.3
23.2
3.3
53.3
43.3
86.7
960.1
1013.3
330.3
100.0
160.1
16.7
50.0
243.2
30.0
770.0
60.0
406.7
1366.6
776.5
53.2
16.1
243.2

Figure 7. Biomass of molluscs (gm./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.


2.1
44.4
27.3
10.1
34.6
193.6
182.2
189.2
336.3
0.4
21.8
32.8
3.5
2.0
1107.5
1264.4
161.1
601.1
140.0
776.9
200.4
464.5
2027.1
335.6
750.0
1977.8
394.8
207.1
1.1
116.8

in the Sound. The mideastern region had densities ranging from 243.2/m^2 at Station 113 to 1366.6/m^2 at Station 129. The total molluscan biomass (Figure 7) inside the mideastern region varied from 200.4 gm/m^2 at Station 113 to 1977.6 gm/m^2 at Station 129.

Two bivalves dominated the molluscan fauna of Cockburn Sound in terms of both density and biomass. *Musculista glaberrima* contributed 43.5% of the total number of molluscs but was only 12.5% of the biomass. *Dosinia incisa* constituted 32.3% of the numbers and 57.4% of the total biomass. The next most important species numerically were *Anomia* cf. *trigonopsis* and *Circe sulcata*.

The density of *Musculista glaberrima* follows the same pattern shown for all species collected and that for all molluscs. Densities of the species (Figure 8) were low over most of the Sound. The species was entirely absent at 8 of the 22 stations outside the mideastern region. The maximum density in the remaining 14 stations was 83.3/m^2. Within the mideastern region area of Stations 87, 92, 93, 113, 126, 129, 130 and 149 densities varied from 93.3/m^2 at Station 113 to 640.0/m^2 at Station 129. Densities at stations within the mideastern region averaged 252.0/m^2; outside that area densities averaged only 40.0/m^2. The biomass of *M. glaberrima* in the mideastern zone (Figure 9) ranged from 1.7 gm/m^2 at Station 87 to 507.8 gm/m^2 at Station 129. In general the stations with the highest densities also had the highest biomass. Station 87 was an exception. Although the population density of *M. glaberrima* at this station was high (326.7/m^2) the individuals were juveniles and the biomass of the species at this station was only 1.7 gm/m^2.

Figure 8. Density of Musculista glaberrima (no./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

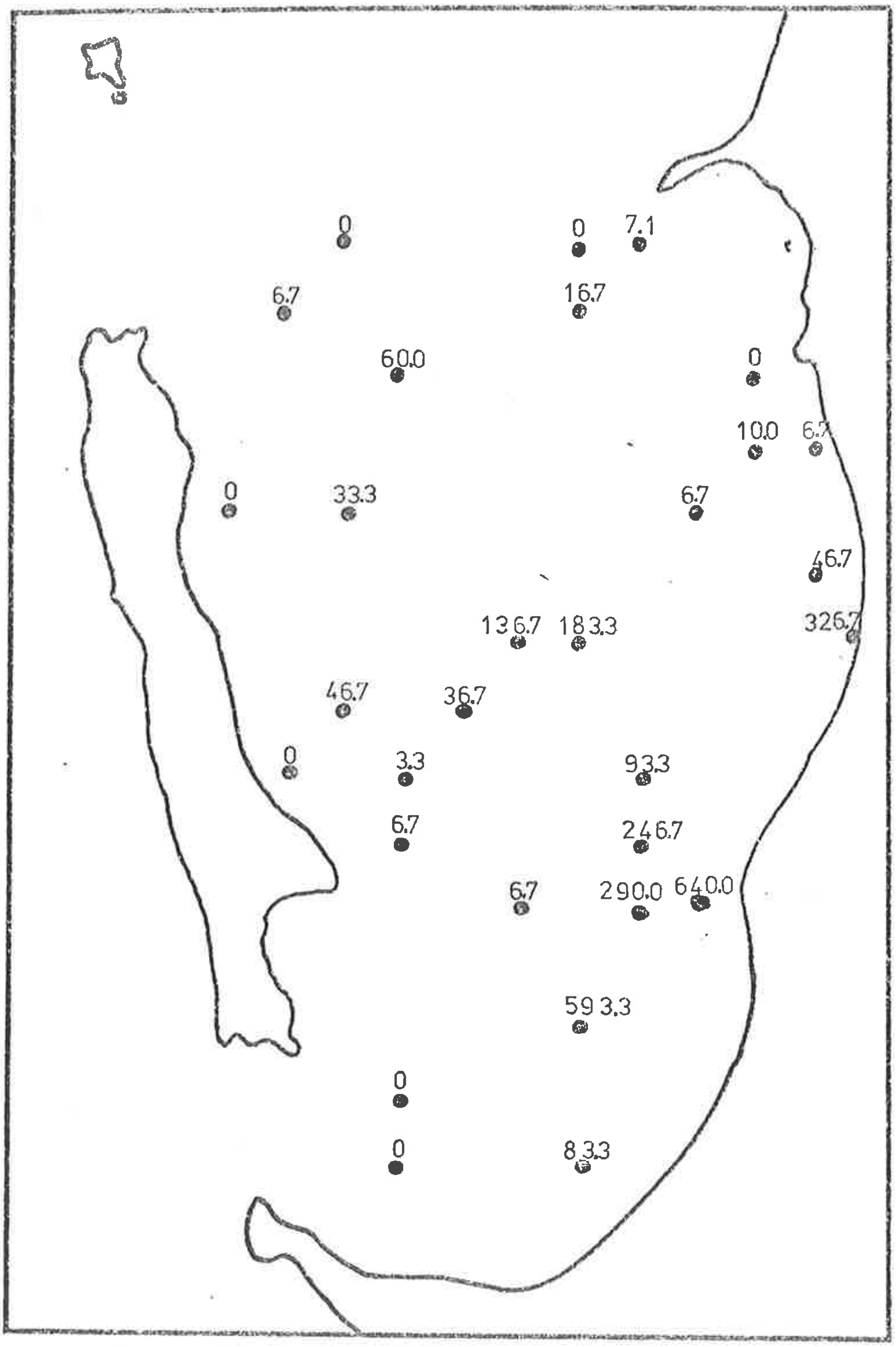
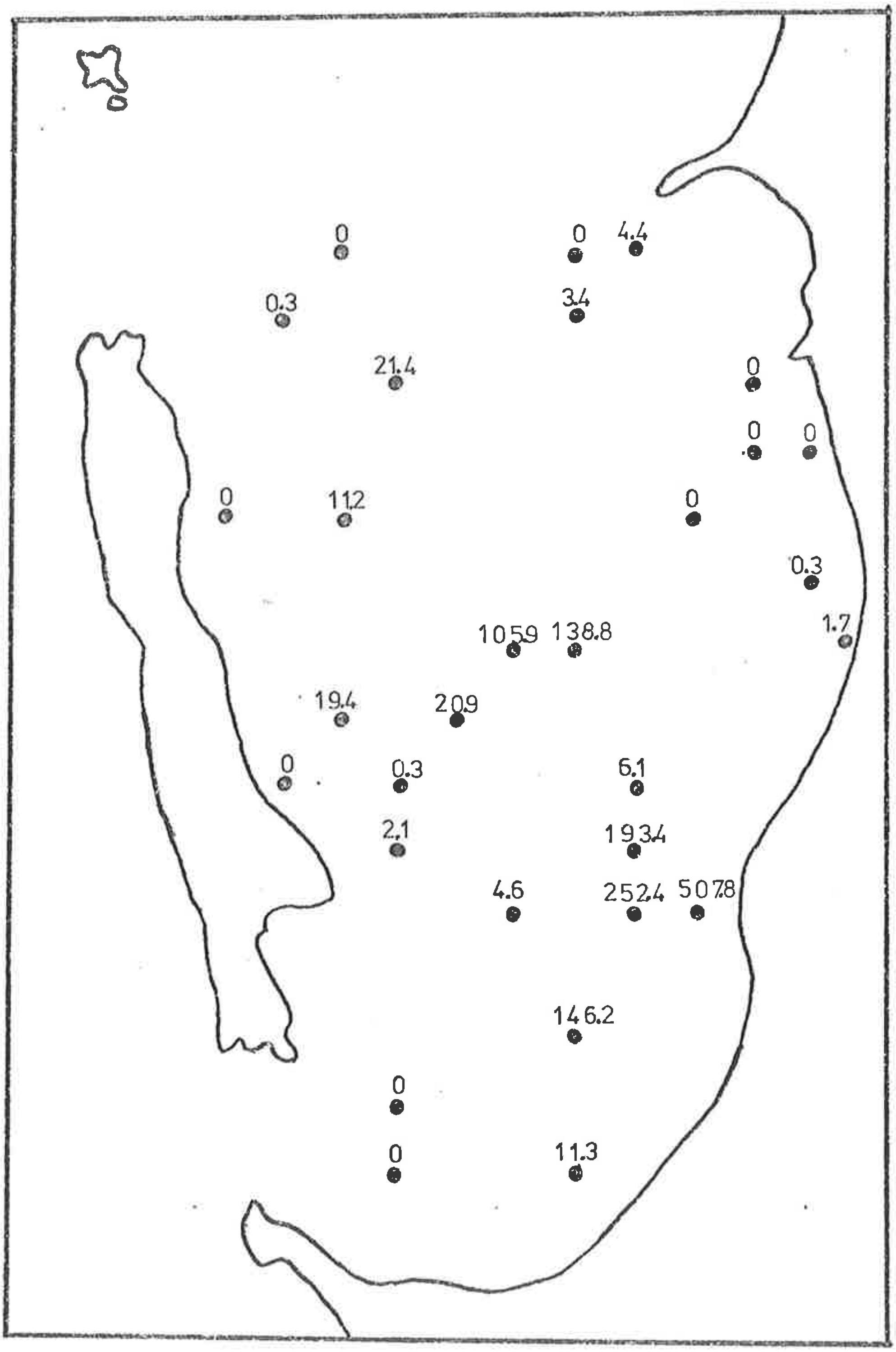

0
0
7.1
6.7
16.7
60.0
0
10.0
6.7
0
33.3
6.7
46.7
136.7
183.3
326.7
46.7
36.7
0
3.3
93.3
6.7
246.7
6.7
290.0
640.0
593.3
0
0
83.3

Figure 9. Biomass of *Musculista glaberrima* (gm./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.


0
0
4.4
0.3
3.4
21.4
0
0
0
0
11.2
0
0.3
105.9
138.8
1.7
19.4
20.9
0
0.3
6.1
2.1
193.4
4.6
252.4
507.8
146.2
0
0
11.3

The pattern of high densities and biomasses in the mideastern region of Cockburn Sound is best shown by the distributional maps of Dosinia incisa (Figures 10 and 11). The species is absent or rare at stations outside the mideastern region, with an average density of only $10.0/m^2$. For this species Station 87 and 149 are outside the region of high abundance. The stations inside the mideastern region had a mean density of $314.9/m^2$. Maximum densities were encountered at Station 92 ($650.0/m^2$) and Station 93 ($666.7/m^2$). These stations and Station 129 also had the highest biomass figures. High biomass figures were also obtained at Stations 101, 103, 117, and 122, which are outside the region of maximal density. This is caused by the presence of a few large individuals of D. incisa in the samples.

The two most abundant molluscs, Musculista glaberrima and Dosinia incisa, were centered in the mideastern region of Cockburn Sound. The two species were not evenly distributed within this area. Musculista glaberrima was most dense at the stations adjacent to the eastern shore of Cockburn Sound. These stations were 87, 126, 129, 130 and 146. The biomass of M. glaberrima was concentrated at Stations 126, 129 and 130, all of which were adjacent to one another. Somewhat lower biomass was recorded at Station 146 to the south. In contrast to M. glaberrima, the highest densities for D. incisa were at stations 92 and 93 to the northwest. Densities for D. incisa at Stations 126 and 129 were only one-third of those recorded at Stations 92 and 93. However, the individuals at Stations 126 and 129 were large and the highest biomass were recorded at these stations.

The third most abundant mollusc, Anomia cf. trigonopsis, had a distributional pattern similar to that exhibited by M. glaberrima (Figures 12 and 13). The maps of Circe sulcata (Figures 14 and 15) are similar to those of Dosinia incisa.

Figure 10. Density of *Dosinia incisa* (no./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia in February and March 1978.

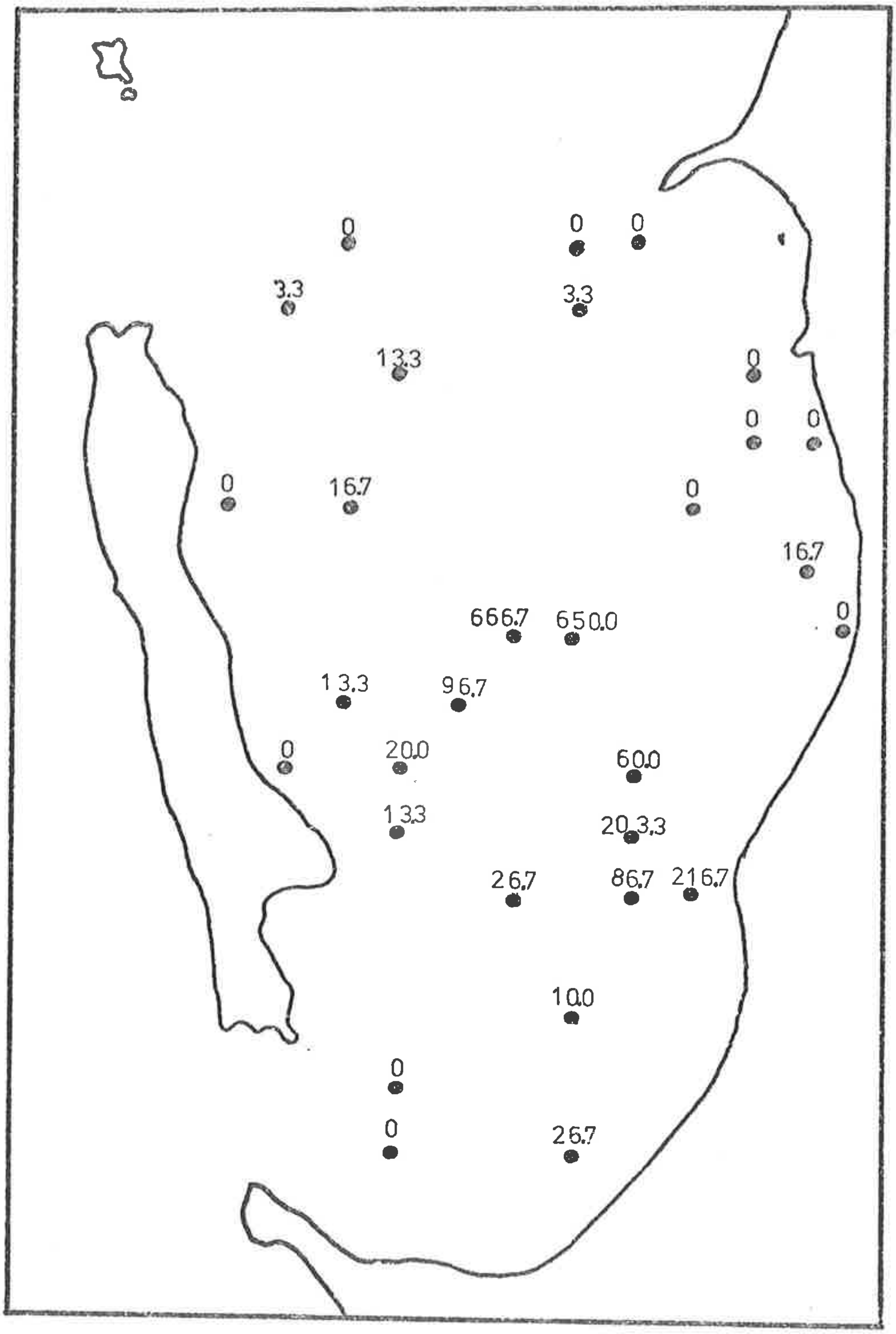

0
0
0
3.3
3.3
13.3
0
0
0
0
16.7
0
16.7
666.7
650.0
0
13.3
96.7
0
20.0
60.0
13.3
203.3
26.7
86.7
216.7
10.0
0
0
26.7

Figure 11. Biomass of Dosinia incisa (gm./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

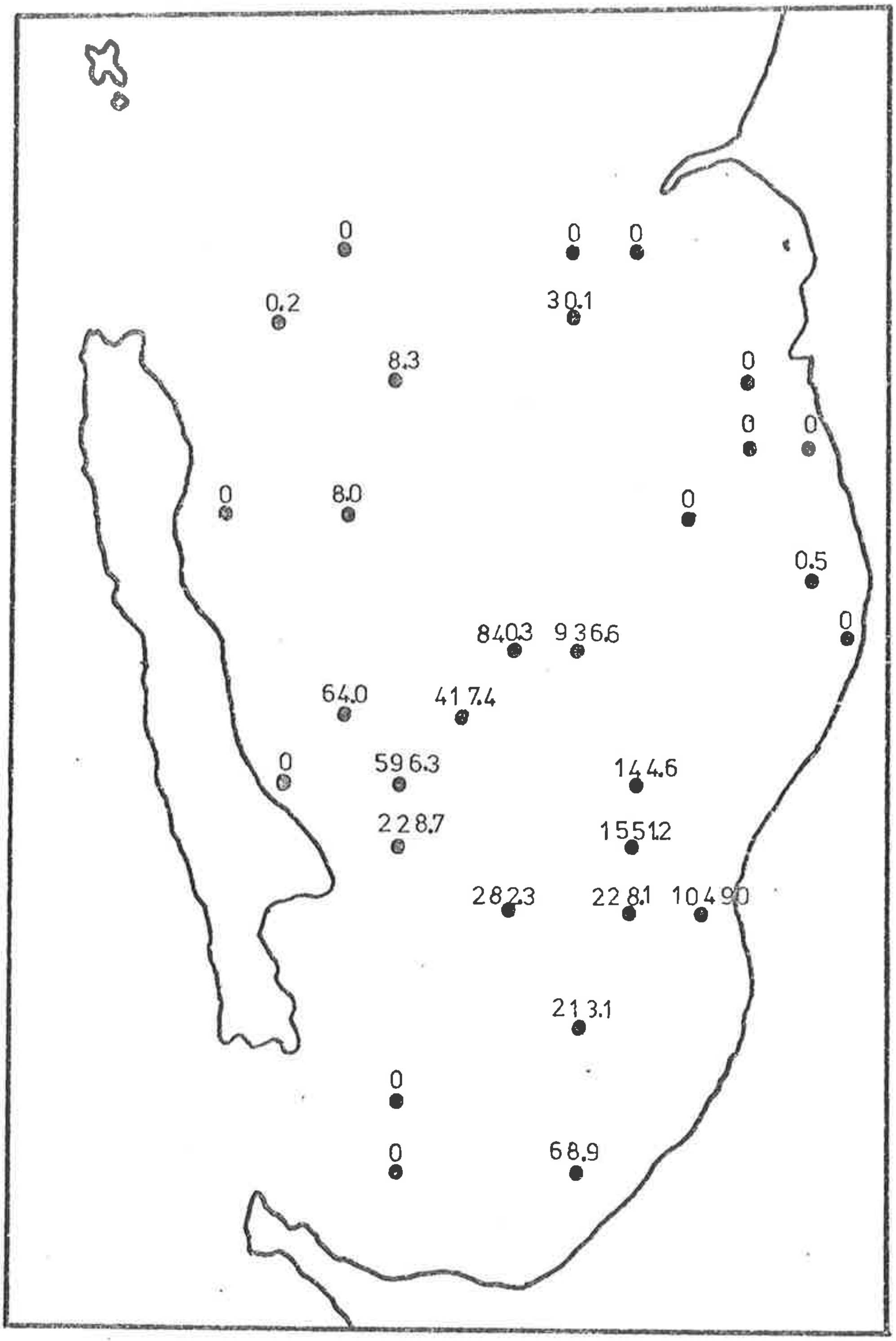

0
0
0
0.2
30.1
8.3
0
0
0
0
8.0
0
0.5
840.3
936.6
0
64.0
417.4
0
596.3
144.6
228.7
1551.2
282.3
228.1
1049.0
213.1
0
0
68.9

Figure 12. Density of *Anomia* cf. *trigonopsis* (no./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

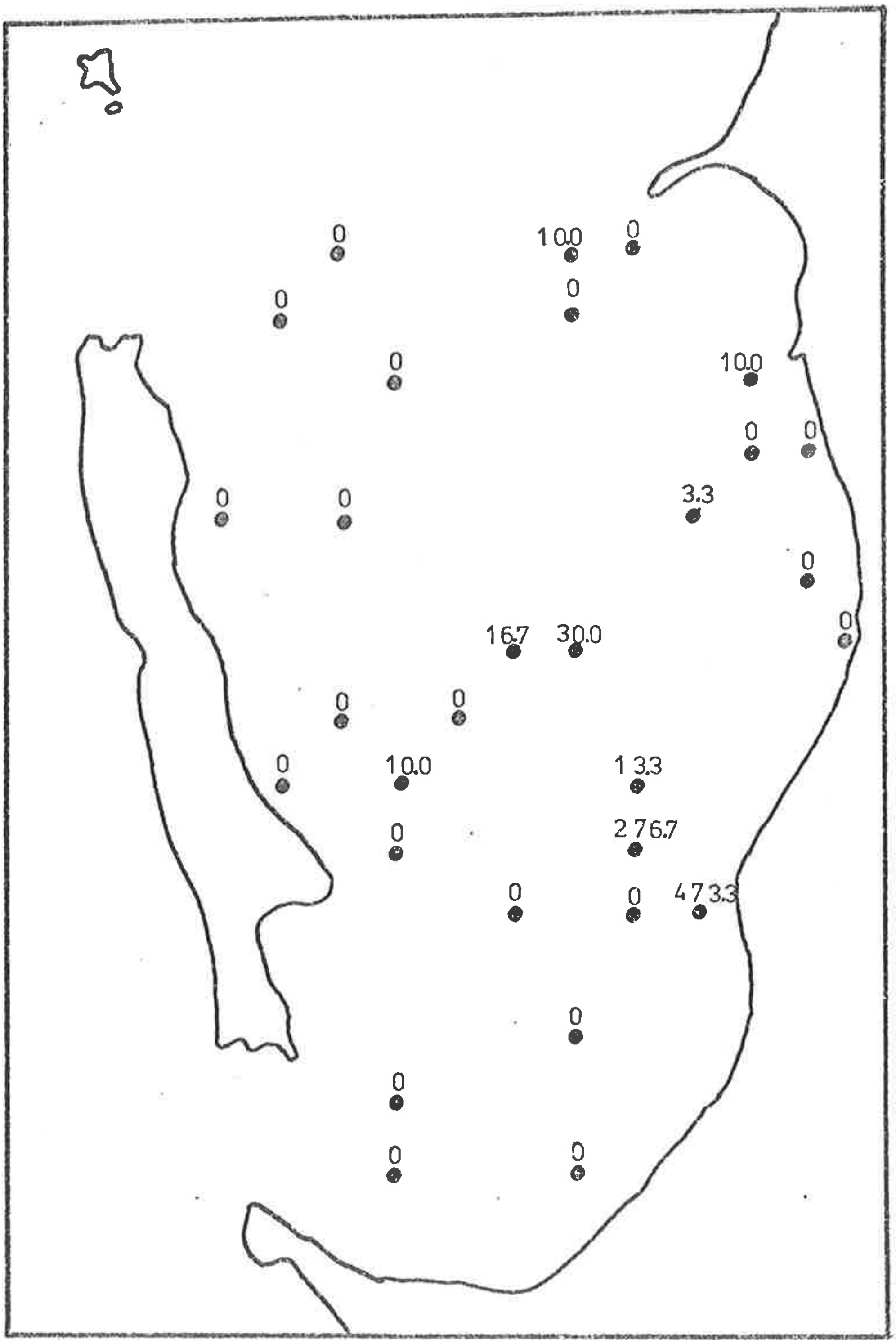

0
10.0
0
0
0
0
10.0
0
0
0
0
3.3
0
16.7
30.0
0
0
0
0
10.0
13.3
0
276.7
0
0
473.3
0
0
0
0

Figure 13. Biomass of Anomia cf. trigonopsis (gm,/m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

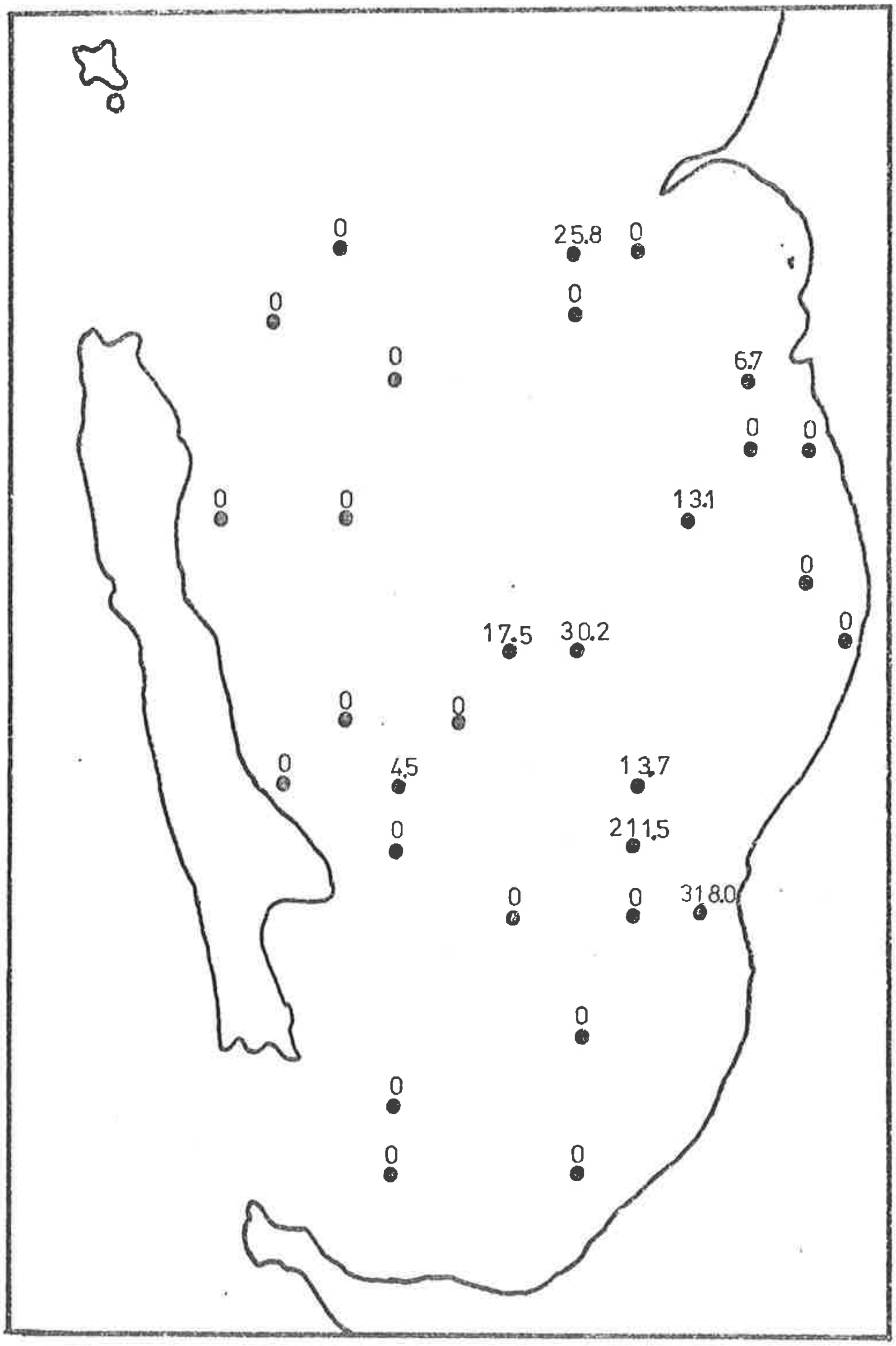

0
25.8
0
0
0
0
6.7
0
0
0
0
13.1
0
0
17.5
30.2
0
0
0
4.5
13.7
0
211.5
0
0
318.0
0
0
0
0

Figure 14. Density of <u>Circe sulcata</u> (no./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

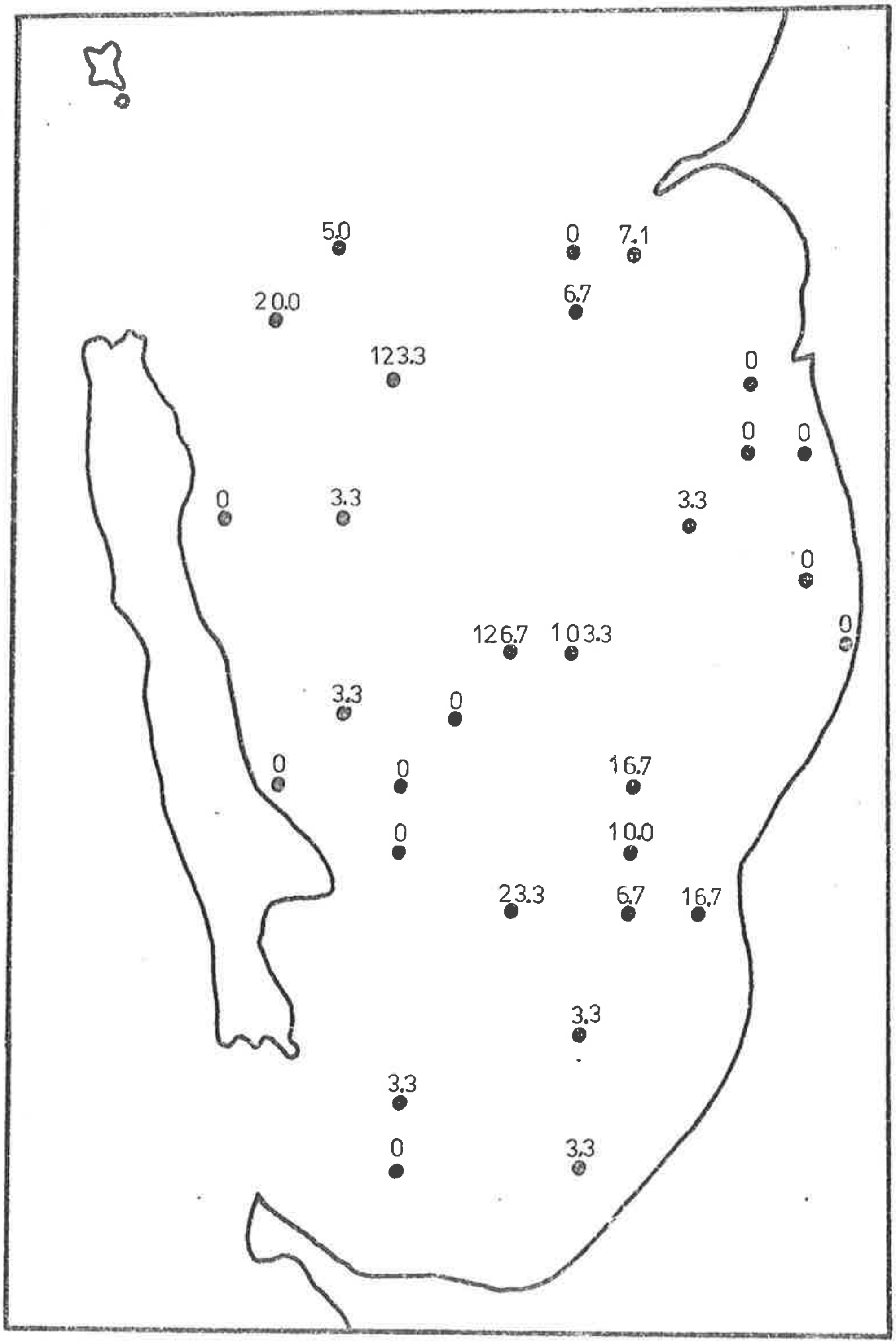
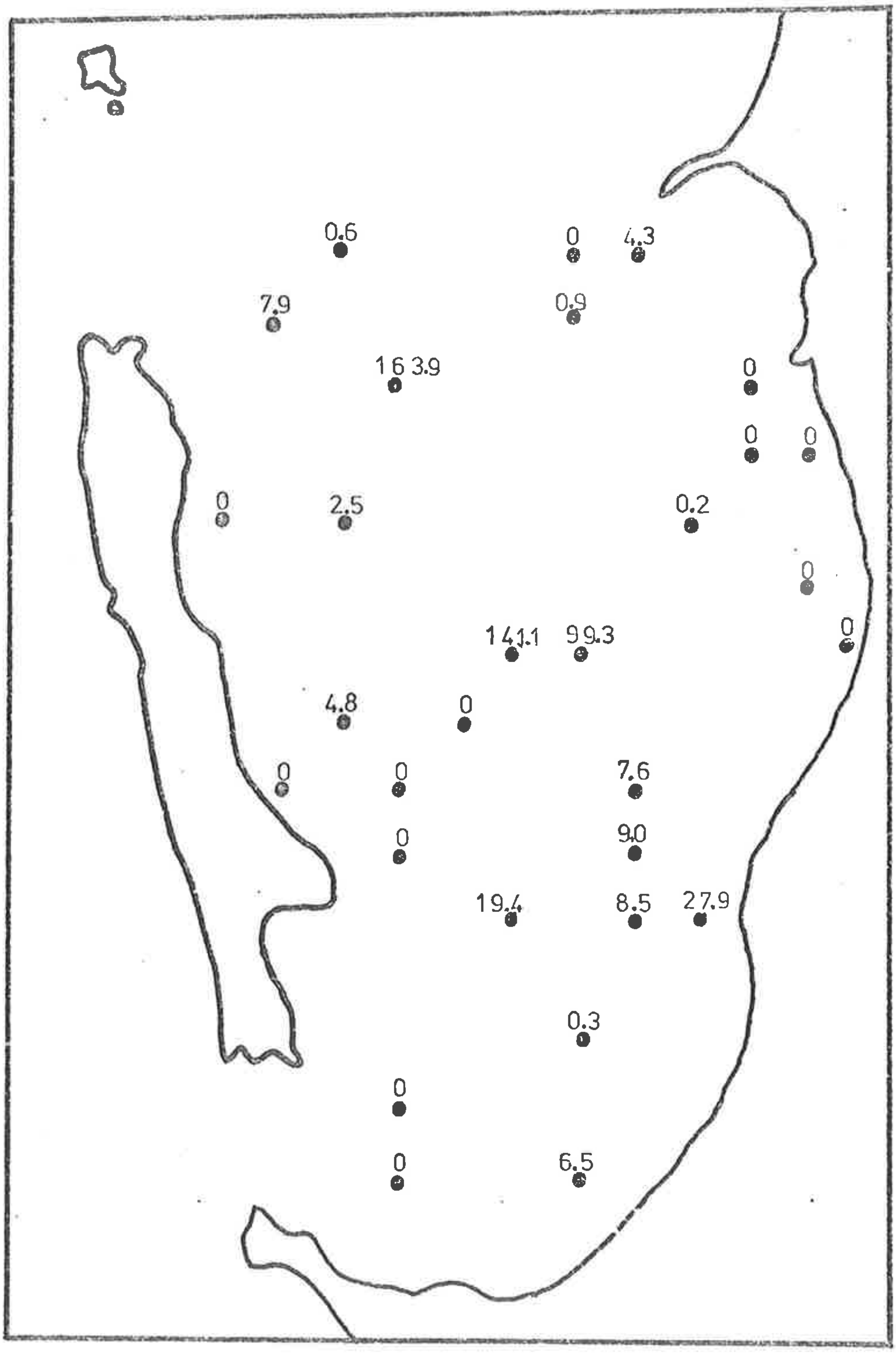

5.0
0
7.1
20.0
6.7
123.3
0
0
0
0
3.3
3.3
0
0
126.7
103.3
3.3
0
0
0
16.7
0
10.0
23.3
6.7
16.7
3.3
3.3
0
3.3

Figure 15. Biomass of Circe sulcata (gm./m^2) collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.



0.6
0
4.3
7.9
0.9
163.9
0
0
0
0
2.5
0.2
0
141.1
99.3
0
4.8
0
0
0
7.6
0
9.0
19.4
8.5
27.9
0.3
0
0
6.5

Thus all of the distributional patterns examined - density and biomass distributions of all species collected, all molluscs, and the four most abundant molluscs examined individually - are all similar. Density and biomass figures are low in the northern sector of Cockburn Sound, along the western side of the Sound and in the southern end. Maximum densities and biomasses were recorded in the mideastern region of the Sound at Stations 92, 93, 113, 126, 129, 130 and 146. In some species high densities and biomasses were also encountered at Stations 103, 117, 122 and 132 to the west of the main area of high density and biomass readings. There is some variation between species within the mideastern region but this was not significant.

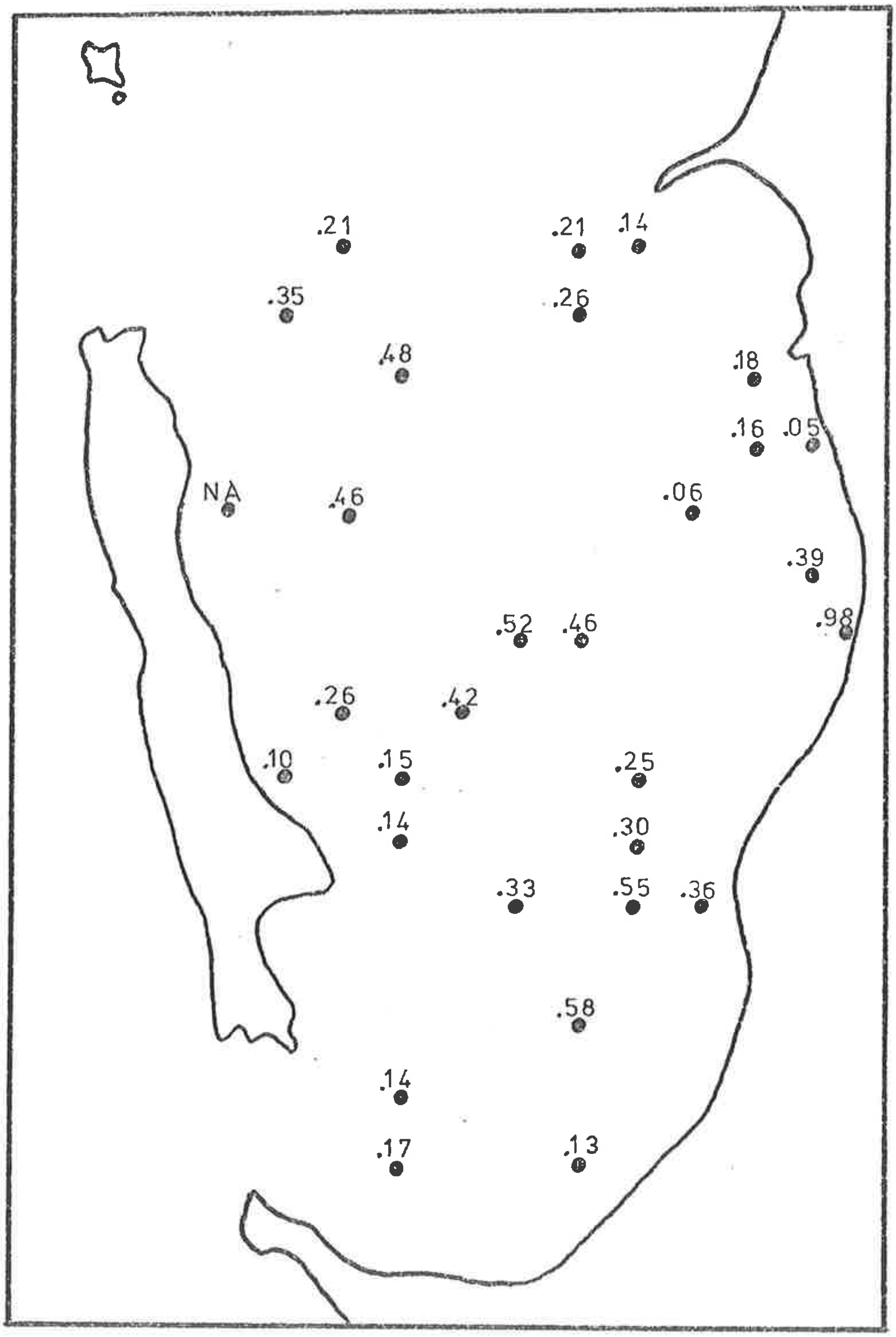
A Simpson's (1949) index of diversity was calculated for the molluscs collected at each station. The index has a formula of:

$$D = \frac{(x)\ (x - 1)}{(X)\ (X - 1)}$$

where x is the number of individuals of each species and X is the total number of individuals.

In this index the value of maximum diversity, where every individual belongs to a different species, is 0. Minimum diversity, where all individuals belong to the same species, has a value of 1. The diversity values calculated for each station with the Simpson index are shown in Figure 16. Diversity values within the Sound varied from 0.05 at Station 60 to 0.98 at Station 87. The low diversity at Station 87 was due to the high numbers of juvenile <u>Musculista glaberrima</u> collected at the station. Diversity was lowest in the mideastern region of Cockburn Sound in the area of Stations 87, 92, 93, 103, 113, 126, 129, 130, 132, and 149. In general these are the stations that had the highest population densities and biomasses. The Simpson index within the mideastern region varied from .14 to .58. Two stations outside the mideastern region also had low diversity : Station 44

Figure 16. Simpson's (1949) index of diversity calculated for the molluscs collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.


.21
.21
.14
.35
.26
.48
.18
.16
.05
NA
.46
.06
.39
.52
.46
.98
.26
.42
.10
.15
.25
.14
.30
.33
.55
.36
.58
.14
.17
.13

(0.48) and Station 70 (0.46). Except for these two stations values outside the mideastern region varied between 0.05 and 0.39. An overall diversity index was calculated for two areas: all stations within the mideastern region (0.32) and all other stations (0.20). The area outside the mideastern region was more diverse than the stations within the nigh density and biomass area.

Community structure of molluscs

Overlaps between stations were determined as described by Popham and Ellis (1971). The resulting overlaps were arranged in a trellis diagram using the techniques outlined by Macfadyen (1957) and Sanders (1960). After the arrangement, which is shown on Figure 17, the maximum number of high values occur together in the center of the diagram. The central values suggest a loose aggregation of molluscs, the core species of which co-occur over a range of stations. The stations involved are 92, 93, 101, 103, 113, 126, 129 and 130. These are the stations of the mideastern region of the deep basin which were characterized by high density and biomass values. The primary species of this community were determined with the ranking method outlined by Sanders (1960). Each species was ranked in the order of its abundance at each station. The most common species at a station was given a value of 10. After the ranks for all stations were summed the seven highest ranking species were: *Musculista glaberrima* 224, *Dosinia incisa* 166, *Circe sulcata* 114, *Anomia* cf. *trigonopsis* 108, *Paphia crassisulca* 88, *Megacardita incrassata* 86, and *Phaxas cultellus* 86. The community can thus be labelled as the *Musculista glaberrima* - *Dosinia incisa* community.

There is no evidence of a second aggregation occurring in the deep basin. Instead stations outside of the mideastern

Figure 17. Trellis diagram of the overlap between stations sampled in Cockburn Sound, Western Australia, in February and March 1978 with a Van Veen grab.

38A

	17	16	167	38	21	60	157	59	87	122	32	103	126	92	101	129	130	113	93	132	117	85	70	44	27	164	64	149	119
17																													
16	.08																												
167	.00	.11																											
38	.00	.18	.14																										
21	.00	.09	.16	.00																									
60	.00	.17	.12	.00	.00																								
157	.11	.18	.33	.11	.28	.00																							
59	.00	.18	.14	.25	.28	.22	.11																						
87	.00	.11	.25	.00	.00	.14	.00	.17																					
122	.00	.09	.17	.12	.14	.11	.12	.28	.20																				
32	.00	.20	.17	.00	.14	.25	.12	.12	.50	.33																			
103	.00	.08	.33	.11	.12	.22	.11	.42	.40	.80	.67																		
126	.08	.23	.10	.18	.20	.08	.18	.18	.11	.50	.33	.36																	
92	.14	.23	.22	.18	.20	.17	.18	.44	.25	.50	.50	.40	.45																
101	.00	.15	.25	.09	.22	.18	.20	.20	.28	.67	.58	.71	.50	.67															
129	.09	.25	.11	.20	.22	.08	.20	.33	.12	.67	.37	.50	.67	.67	.55														
130	.00	.18	.12	.10	.25	.09	.22	.37	.14	.55	.42	.58	.55	.55	.62	.62													
113	.09	.50	.25	.09	.10	.18	.22	.20	.28	.37	.58	.50	.50	.67	.71	.40	.58												
93	.10	.27	.14	.10	.11	.20	.10	.10	.33	.25	.67	.62	.40	.55	.67	.44	.33	.62											
132	.00	.20	.00	.00	.14	.11	.12	.28	.20	.60	.60	.50	.50	.50	.58	.58	.67	.58	.42										
117	.08	.17	.20	.18	.09	.17	.08	.30	.25	.44	.33	.62	.42	.60	.62	.45	.36	.50	.58	.44									
85	.00	.18	.60	.11	.12	.10	.28	.25	.17	.50	.42	.80	.30	.44	.58	.30	.37	.50	.37	.28	.44								
70	.00	.22	.00	.00	.16	.18	.14	.14	.25	.40	.75	.33	.37	.37	.42	.42	.50	.42	.50	.75	.22	.33							
44	.00	.22	.00	.00	.16	.12	.14	.14	.25	.40	.75	.33	.37	.37	.42	.42	.50	.42	.50	.75	.22	.33	1.00						
27	.00	.17	.28	.10	.11	.20	.22	.22	.33	.42	.67	.57	.40	.55	.62	.44	.50	.44	.50	.42	.40	.57	.50	.50					
164	.08	.23	.20	.08	.18	.17	.27	.44	.18	.44	.44	.55	.55	.70	.60	.45	.50	.45	.36	.44	.38	.27	.33	.33	.50				
64	.00	.00	.20	.25	.30	.15	.16	.40	.22	.18	.30	.27	.31	.43	.33	.33	.25	.60	.36	.36	.36	.17	.20	.20	.25	.38			
149	.00	.00	.20	.17	.08	.15	.28	.17	.22	.30	.30	.40	.33	.21	.33	.33	.22	.33	.25	.18	.28	.40	.20	.20	.36	.28	.12		
119	.14	.00	.20	.14	.16	.00	.33	.33	.00	.60	.00	.33	.22	.22	.25	.25	.28	.11	.00	.16	.22	.14	.00	.00	.12	.33	.09	.09	

region had some species in common with stations inside the region. The dividing lines are not distinct. Stations progressively further from the mideastern region had progressively less overlap with those in the center of the sector.

The shallow stations 16 and 17 had little or no overlap with the stations of the deep basin. This suggests that a second aggregation was present at these stations, and in fact both stations were located in *Posidonia* beds. There were not enough samples made in the *Posidonia* to adequately describe the community.

Feeding types of molluscs

One of the key features in the structure of benthic communities is the channelling of energy resources between the constituent organisms of the community. To obtain a preliminary indication of the sources of energy utilized by the molluscs of Cockburn Sound the 34 species collected were assigned to the six feeding categories established by Poore and Rainer (1974). Little direct information is available on the feeding mechanisms and food preferences of Western Australian molluscs. While the details of feeding vary between species in a genus or family the basic feeding mechanisms and types of food consumed are usually consistent. The assignments used here were based on the feeding mechanisms employed by taxonomically closely related species as reported by Morton (1958), Poore and Rainer (1974) and Thompson (1976).

The feeding types for each species are shown on Table 2. Seventeen of the 34 species were infaunal suspension feeders. Sixteen of the remaining species were divided among four feeding categories: predators (5 species), epifaunal suspension

Table 2. Feeding types of molluscs collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978. The categories follow Poore and Ranier (1974).

Suspension feeders (epifaunal)

Anomia cf. *trigonopsis*
Chama ruderalis
Mytilus edulis planulatus
Vermetid sp.

Suspension feeders (infaunal)

Arcopagia (*Pinguitellina*) sp.
Circe sulcata
Dosinia incisa
Epicodakia sp.
Fulvia aperta
Hiatella australis
Laternula creccina
Lithophaga sp.
Mactra ovalina
Malleus meridionalis
Megacardita incrassata
Musculista glaberrima
Paphia crassisulca
Phaxas cultellus
Solemya cf. *velesiana*
Tawera lagopus
Timoclea cardiodes

Surface deposit feeders

Tellina (*Tellinangulus*) sp.
Tellina (*Tellinides*) sp.
Theora lubrica

Grazers

Astrea tentorium
Bulla botanica
Ischnochiton contractus
Ischnochiton sp.

Predators

Bedeva paivae
Pervicacia sp.
Polinices conicum
Pyrene scripta
Trigonostoma scalarina

Scavengers

Nossarius pauperus

feeders (4), grazers (4), and surface deposit feeders (3). Only one species of scavenger was collected in the Van Veen grab samples.

Infaunal suspension feeders, all of which were bivalves, dominated the samples, constituting 82.2% of all individuals collected and 89.5% of the molluscan biomass. The four species of epifaunal suspension feeders, three of which were bivalves, contributed an additional 11.6% of all individuals collected and 7.5% of the biomass (Table 3). Thus 93.8% of the molluscs collected in the study were suspension feeders, dependent on the overlying waters for their food resources. These animals were 97.0% of the total molluscan biomass. The distribution of suspension feeders is shown on Figures 18 and 19. Once again the pattern of high density and biomass figures in the mideastern region emerges. Outside of that area the numbers recorded are substantially lower.

In comparison with the suspension feeders the remaining four feeding categories were minor elements of the fauna. Surface deposit feeders were the most numerous of the minor feeding categories with 5.8% of all individuals (Table 3) and grazers were the largest biomass component, with only 1.8%. Together the four feeding categories of surface deposit feeders, grazers, predators and scavengers accounted for only 6.3% of the individuals collected and 2.9% of the biomass.

Musculista glaberrima and Dosinia incisa

Four species of bivalves (Musculista glaberrima, Dosinia incisa, Anomia cf. trigonopsis, and Circe sulcata) constituted 95.8% of all molluscs collected and 79.8% of the molluscan biomass. All four were classified as suspension feeders. They thus might form a key link in converting the food resources of

Table 3. Characteristics of the feeding types of molluscs collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

Feeding type	Number of species	Percentage of individuals	Percentage of biomass
Suspension feeders (epifaunal)	4	11.6	7.5
Suspension feeders (infaunal)	17	82.2	89.5
Surface deposit feeders	3	5.8	0.9
Grazers	4	0.3	1.8
Predators	5	0.2	0.2
Scavengers	1	0.0	0.0
TOTALS	34	100.1	99.9

Figure 18. Percentage of the mollusc density contributed by suspension feeders in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.

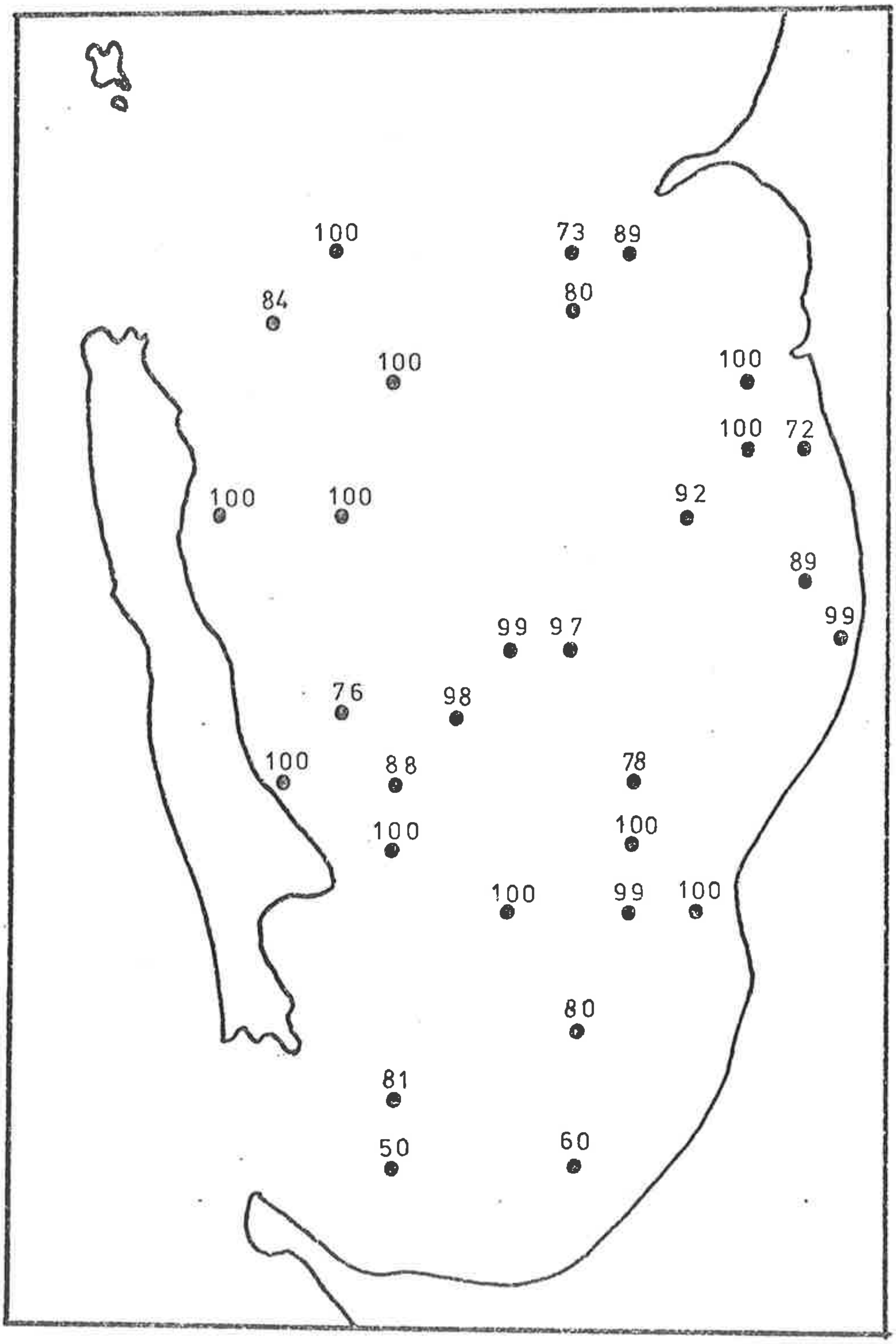
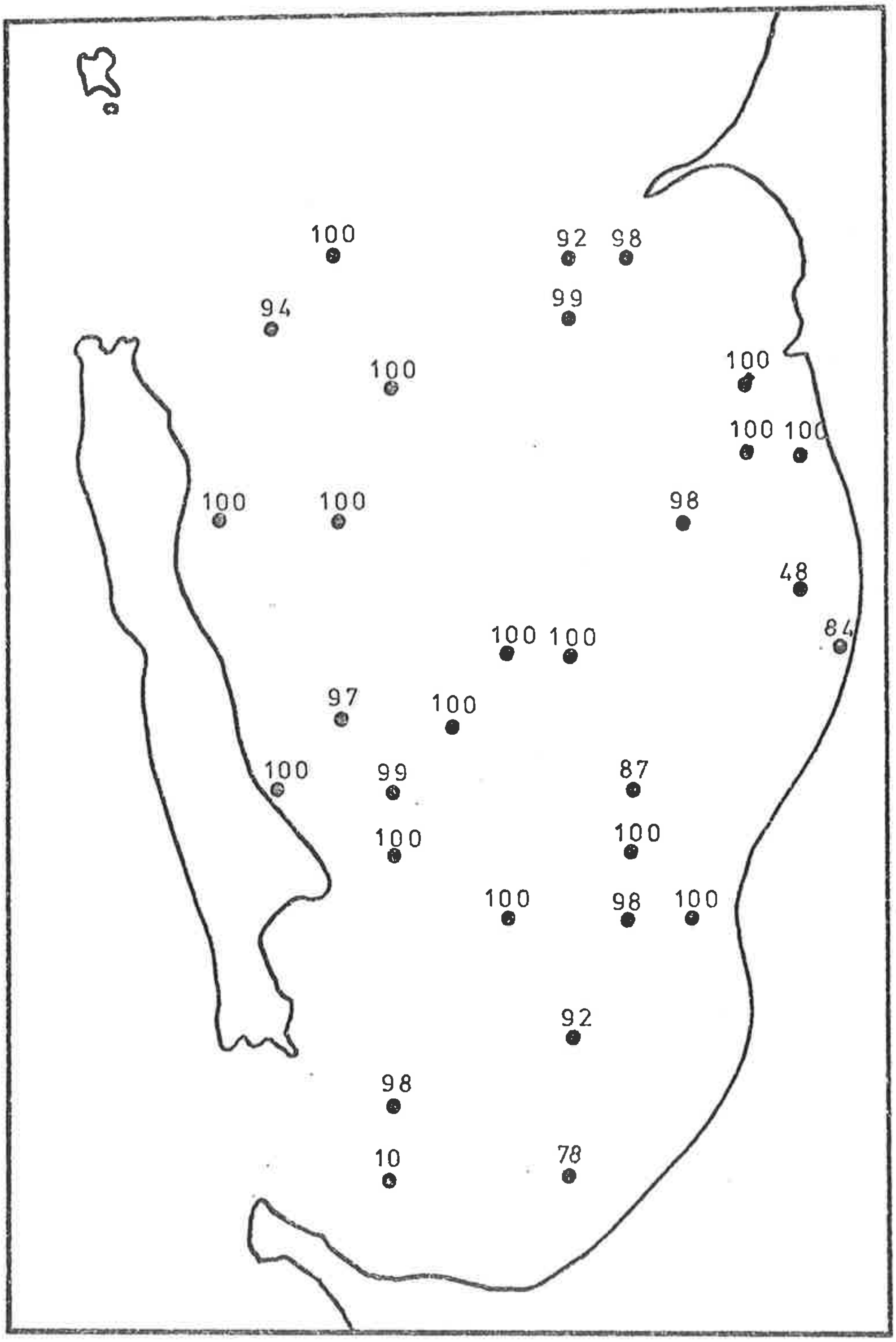

100
73
89
84
80
100
100
100
72
100
100
92
89
99
97
99
76
98
100
88
78
100
100
100
99
100
80
81
50
60

Figure 19. Percentage of the mollusc biomass contributed by suspension feeders in Van Veen grab samples made in Cockburn Sound in February and March 1978.

4/4A


100
92
98
94
99
100
100
100
100
100
100
98
48
100
100
84
97
100
100
99
87
100
100
100
98
100
92
98
10
78

the water column into a form available to bottom feeding fish and macroinvertebrates. Because of this possibility the four dominant molluscs warrant detailed consideration.

I have recently (Wells, 1978) examined the relationship between the distribution of the mud snail Hydrobia totteni and eight physical parameters (dissolved oxygen concentration, pH, eH, water depth, salinity, sediment grain size, temperature, and organic carbon in the sediments) in a small salt marsh in Nova Scotia, Canada. Of the eight parameters only two, water depth and sediment grain size, showed significant correlations with snail densities.

Both water depth and sediment grain size were measured in the Cockburn Sound study. The results of these measurements are shown on Figures 20 and 21. A correlation analysis (Table 4) was made between the population densities of each of the four most abundant mollusc species and sediment grain size and water depth acting independently. Sediment grain size alone explained 11.5% of the variation in population density of Anomia cf. trigonopsis. Percentages explained were higher in the other three species, with the maximum of 34.4% occurring in Musculista glaberrima. Similar results were obtained for the correlation of population densities with water depth. The values explained ranged from a low of 8.2% in Anomia cf. trigonopsis to a high of 28.0% in Musculista glaberrima.

A multiple correlation analysis was then performed on the relationship between the population density of each species and the combination of sediment grain size and water depth. An estimating equation of the form

$$y = a + bX_1 + cX_2$$

was established for each species. In the equation Y is the

Table 4. Correlation of sediment grain size and water depth with population densities of four species of bivalves collected in Van Veen grab samples made in Cockburn Sound, Western Australia in February and March 1978.

Species	Correlation with grain		Correlation with water		Correlation with sediment grain size and water depth		
	r	r^2	r	r^2	Estimating equation	r	r^2
Anomia cf. *trigonopsis*	.339	.115	.287	.082	Y = -293.8 -0.07a+ 6.84b	.544	.296
Circe sulcata	.395	.156	.490	.240	Y = - 32.0 -0.26a+ 0.81b	.424	.180
Dosinia incisa	.432	.187	.451	.203	Y = -135.1 -0.76a+ 4.39b	.478	.229
Musculista glaberrima	.586	.343	.529	.280	Y = -162.7 +0.26a+ 5.51b	.605	.366

Figure 20. Water depth in metres of stations sampled with a Van Veen grab in Cockburn Sound, Western Australia, in February and March 1978.

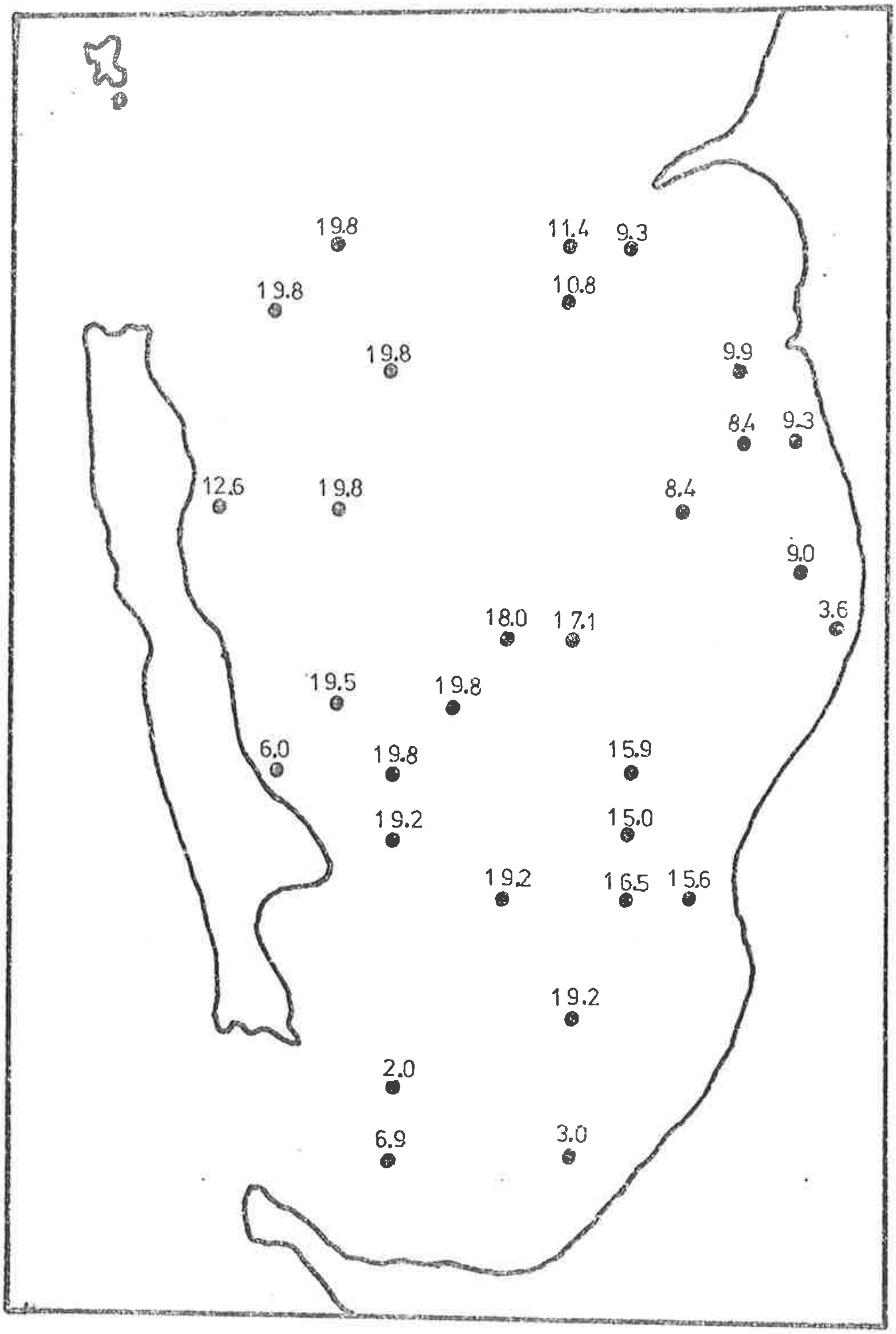
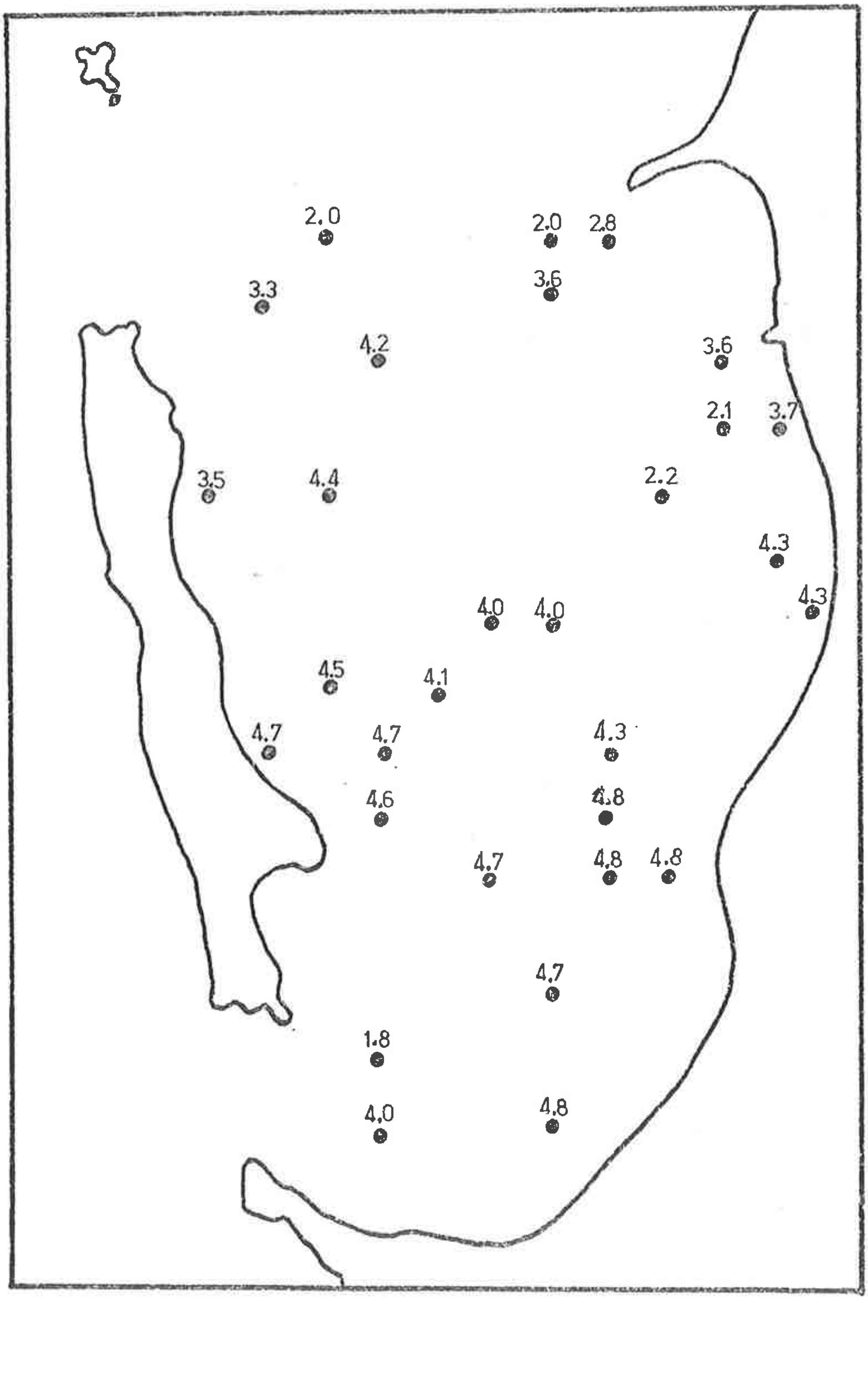

19.8
11.4
9.3
19.8
10.8
19.8
9.9
8.4
9.3
12.6
19.8
8.4
9.0
3.6
18.0
17.1
19.5
19.8
6.0
19.8
15.9
19.2
15.0
19.2
16.5
15.6
19.2
2.0
6.9
3.0

Figure 21. Sediment grain size in mean Ø value of stations samples with a Van Veen grab in Cockburn Sound, Western Australia, in February and March 1978.


2.0
2.0
2.8
3.3
3.6
4.2
3.6
2.1
3.7
3.5
4.4
2.2
4.3
4.0
4.0
4.3
4.5
4.1
4.7
4.7
4.3
4.6
4.8
4.7
4.8
4.8
4.7
1.8
4.0
4.8

population density; a, b and c are constants; X_1 is the sediment grain size; and X_2 is the water depth. The equations for each species are shown on Table 4. The percentages of the population densities explained by the combination of sediment grain size and water depth ranged from 18.0% in Circe sulcata to 36.6% in Musculista glaberrima. In general the combination of sediment grain size and water depth explained a greater portion of the variation in population density than either factor acting alone, but the increase in the explained variation was not great.

Two bivalves were abundant enough to allow an examination of their population characteristics. Musculista glaberrima was 43.5% of all molluscs collected and 12.5% of the biomass; Dosinia incisa contributed 32.3% by number and 57.4% by weight. The relationship between shell length and total wet weight of the individual, including the shell, was calculated from the equation

$$\text{Log}_{10}\text{Weight}_{(gm)} = a + b\ \text{Log}_{10}\text{Length}_{(mm)}$$

where a and b are constants. The two resulting equations are shown on Table 5 and are graphed on Figure 22.

Figure 23 shows the size frequency curves of Dosinia incisa and Musculista glaberrima. Both are bimodal. The graph of D. incisa shows a strong peak in the 16-20 mm size class and a much smaller peak in the 52-56 mm size class. No studies have been conducted on the growth rate of D. incisa and it is not known whether the bimodality of the graph reflects two year classes. The graph of M. glaberrima does clearly show two year classes. Reproduction of the species (as Amygdalum glaberrimum) in Cockburn Sound was examined by Wilson and Hodgkin (1967). They found M. glaberrima to have a life cycle of a little over one year. Spawning occurred in the early summer months of October and November and the first spatfall occurred in November. A prominent feature of the reproductive cycle was the postreproductive mortality of adults, which disappeared from the population in February and March. Figure 23, which is based on collections made from 27 February to 1 March, shows that the recently settled young had already achieved a mean size of 10.3 mm. The adults, with a mean size of 29.6 mm, were about 15 months old and would soon perish.

Table 5. Population characteristics of *Musculista glaberrima* and *Dosinia incisa* collected in Cockburn Sound during Feburary and March 1978.

Species	Number of individuals	Size range Min. (mm)	Size range Max. (mm)	Median (mm)	Relationship between shell length and total weight
M. glaberrima	869	3.3	36.3	26.4	$\log_{10}Weight_{(gm)} = -12.02 + 3.46 \log_{10}Length_{(mm)}$
D. incisa	643	3.0	63.0	23.0	$\log_{10}Weight_{(gm)} = -9.22 + 3.10 \log_{10}Length_{(mm)}$

	Biomass per station Minimum (gm/m^2)	Maximum (gm/m^2)	Mean (gm/m^2)	Density per station Minimum ($no./m^2$)	Maximum ($no./m^2$)	Mean ($no./m^2$)
M. glaberrima	0.0	507.8	48.4	0.0	640.0	96.6
D. incisa	0.0	1551.2	222.4	0.0	666.7	71.4

Figure 22. Graphs of $\log_{10}$ length in mm versus $\log_{10}$ weight in grams for Musculista glaberrima (upper) and Dosinia incisa (lower) collected in Van Veen grab samples made in Cockburn Sound, Western Australia in February and March 1978.

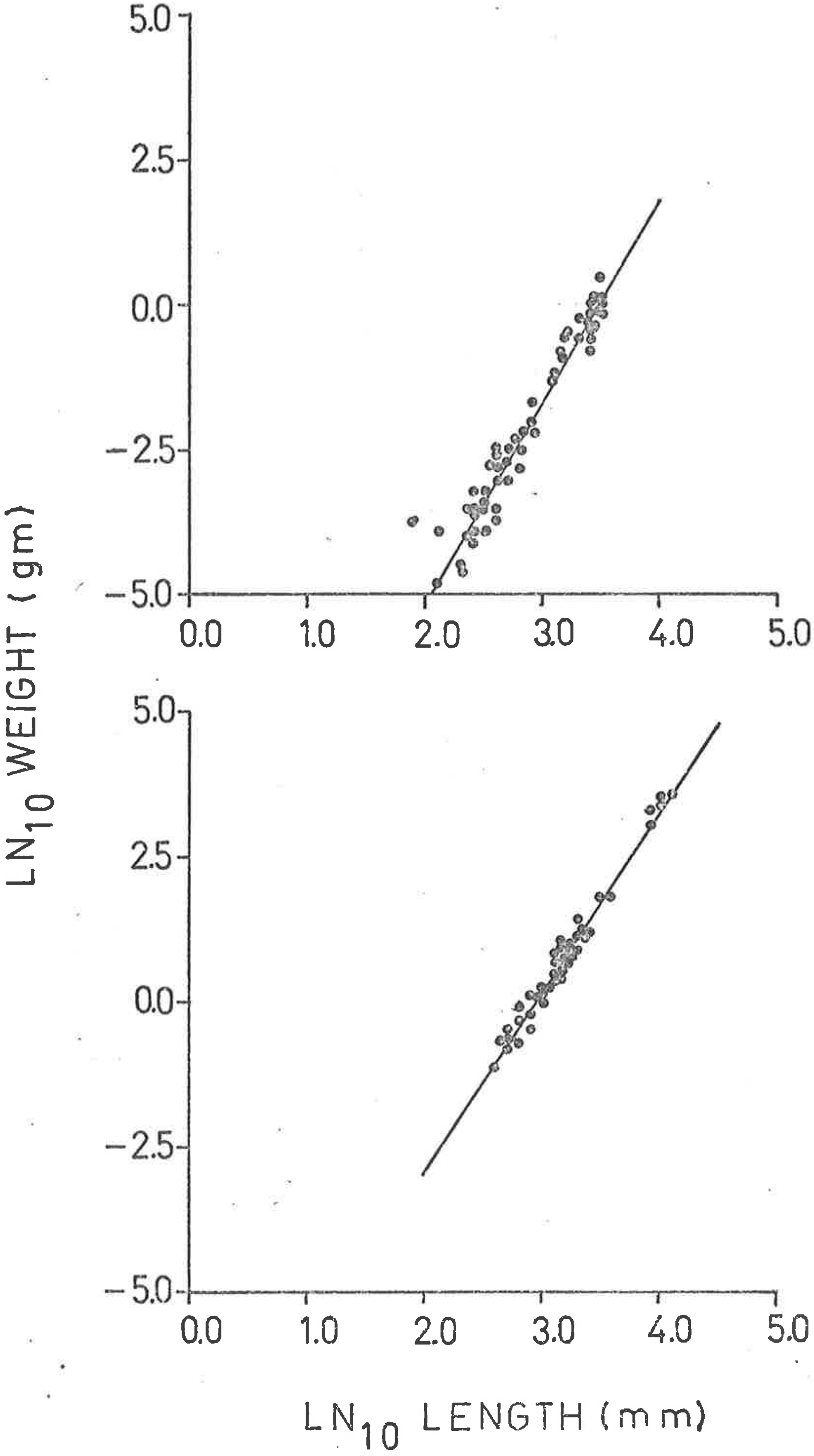
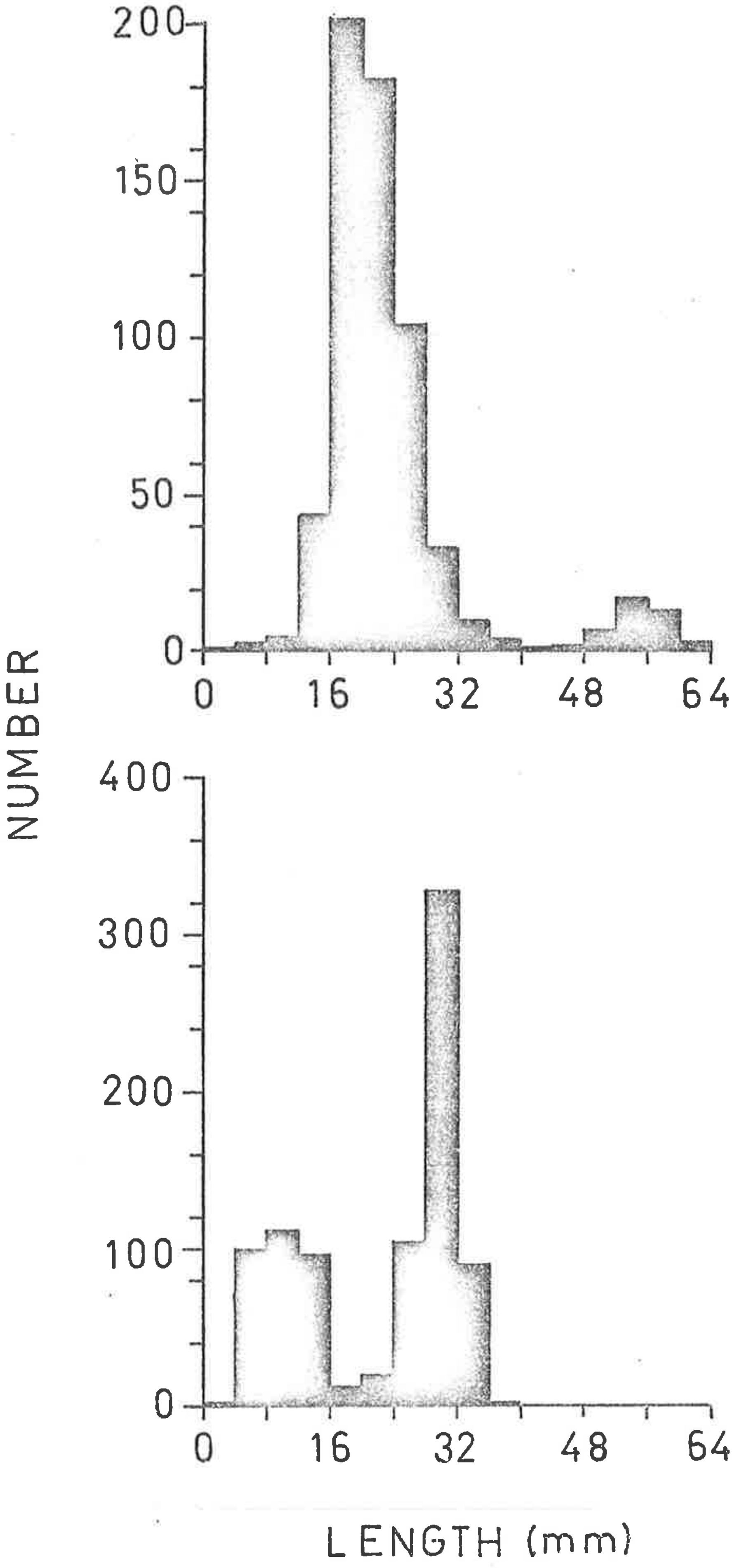

5.0
2.5
0.0
−2.5
−5.0
0.0
1.0
2.0
3.0
4.0
5.0
LN10 WEIGHT (gm)
LN10 LENGTH (mm)

Figure 23. Population characteristics of Musculista glaberrima and Dosinia incisa collected in Van Veen grab samples made in Cockburn Sound, Western Australia, in February and March 1978.


200
150
100
50
0
0
16
32
48
64
NUMBER
400
300
200
100
0
0
16
32
48
64
LENGTH (mm)

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A study of this nature cannot be undertaken without a tremendous amount of assistance from a number of people. I would like to thank all who have assisted the project in so many different ways. The use of the M.V. Henrietta was arranged by G. Henderson of the Department of Maritime Archaeology of the Western Australian Museum. The assistance of C. Bryce, C. Powell and R. Richards in operating the Henrietta and the Van Veen grab was invaluable. Samples were sorted and treated by T. Threlfall. Mr Threlfall provided a great deal of assistance throughout the project. Several members of the Museum staff used the taxonomic expertise to identify the animals collected: A. Brearley (Mollusca), Dr R. George (Crustacea), L. Marsh (Coelenterata and Echinodermata) and S. Slack-Smith (Mollusca). In addition L. Joll of the Fisheries and Oceanography Division of the Commonwealth Scientific and Industrial Research Organization, Perth, identified the polychaetes. Dr. D. Devaney of the Bernice P. Bishop Museum, Honolulu, Hawaii, identified some of the ophiuroids. Dr B.R. Wilson read and criticized the manuscript. The report was typed by M. Wallis, who had to put up with Appendix 2. L. Baxter was helpful in a number of ways throughout the study. The investigation was funded by the W.A. Department of Conservation and Environment.

DISCUSSION

Molluscs dominated the study, comprising 72.19% of all individuals collected and 89.56% of the biomass. Among the molluscs the four most common species (Musculista glaberrima, Dosinia incisa, Anomia cf. trigonopsis, and Circe sulcata) constituted 95.8% of the molluscan biomass. The dominance of a few species in an ecosystem is a common feature and is not limited to Cockburn Sound. Working in Buzzards Bay, Massachusetts, on the American northeast coast Sanders (1960) found that two species, the mollusc Nucula proxima and the polychaete Nepthys incisa, were 76.1% of all individuals collected. Driscoll and Brandon (1973) later looked at the molluscs of the northwestern area of Buzzards Bay. Four facies were investigated, three of which were characterized by fine sediments with Ø values of 2.5 or greater. In each of the fine sediments the three most common molluscs were 85.0 to 94.2% of all individuals collected. Working in Western Port, Victoria, Coleman (1976) recorded the top 12 of 121 species as 66% of all individuals.

The preponderance of a few species in the density and biomass data was not unexpected, but the relatively few mollusc species collected in Cockburn Sound was. Only 34 species were collected in the Van Veen grab samples. Working in two areas of the Victorian coast with essentially the same methods used in Cockburn Sound Poore and Rainer (1974) and Coleman (1976) reported 105 and 121 mollusc species respectively. Wade (1972) recorded 22 in Jamaica and McNulty et. al. (1962) found 54 in Biscayne Bay, Florida. With somewhat different methods Driscoll and Brandon (1973) collected 39 species in Buzzards Bay. Thus the present study indicates that the number of mollusc species in Cockburn Sound is less than other areas studies with comparable methods.

However, Wilson, Kendrick and Brearley (1978) reported a high diversity of molluscs in Cockburn Sound, and listed 295 species from the area. Two explanations can be offerred to reconcile the differences between the list of Wilson, Kendrick and Brearley and the present study. Their report is based on collections made from 1956 to 1960, with some additional species collected after 1960 included in the paper. The molluscan fauna of the Sound could have become impoverished in the last 20 years as a result of increased pollution levels. Alternatively the differing number of species recorded can be attributed to the different methods used in the two studies.

The report of the Naturalist Club survey (Wilson, Kendrick and Brearley 1978) includes all molluscs collected in Cockburn Sound which are in the collections of the Western Australian Museum. Many of the species are recorded only from dead shells; a study of the present type would not record these rare species. Chittleborough (1970) and Wilson, Kendrick and Brearley (1978) divided the fauna of Cockburn Sound into 5 assemblages: open sand on the peripheral sills and banks, the seagrass community, eastern shelf, reefs and the central basin. Rocky shores on the fringes of the Sound provide a sixth habitat. Of the above categories rocky shores and reefs were not sampled at all in the present study because of sampling limitations, and the seagrass community was sampled only minimally. While the open sand on the sills has a number of mollusc species the total area involved is small and the habitat was not sampled. This substantially decreases the number of species which could be expected in a quantitative investigation. The present results are most comparable with those of Wilson, Kendrick and Brearley (1978) for the central basin and eastern shelf. Together these areas comprise 86% of the area of Cockburn Sound.

Wilson, Kendrick and Brearley (1978) listed 13 species of molluscs as being characteristic of the central basin of Cockburn Sound. All except two, Nuculana verconis and Pecten modestus, were collected in the present study, but freshly dead shells of both were found. There is some evidence that the population density of N. verconis is erratic. The species may alternate between increasing its density markedly during favourable periods and sufferring decreases during unfavourable times. Fluctuations such as this have been recorded in bivalve molluscs by Coe (1957). The population of P. modestus was reduced by commercial fishing but the fresh shells collected indicate the presence of a viable population in the central basin of Cockburn Sound. Thus the absence of two of the species that Wilson, Kendrick and Brearley considered to be characteristic of the central basin can be easily explained, and there is no evidence of substantial changes in the molluscan fauna of the central basin in the last 20 years.

Wilson, Kendrick and Brearley (1978) considered 12 gastropods to be characteristic of the Posidonia beds on the eastern shelf. Only one of these species was collected in this study. Posidonia has largely disappeared from the eastern shelf, probably as a result of industrial development (Scott, 1976). With the disappearance of the seagrass the characteristic molluscs have disappeared also. The species have not been lost to Cockburn Sound as they still occur on the seagrass beds of Parmelia Bank, the southern flats and the fringes of Garden Island. Wilson, Kendrick and Brearley (1978) recorded the species characteristic of the central basin in isolated sand patches on the eastern shelf. These species have become more common on the shelf as the amount of sand bottom increased.

The longterm sublethal effects of pollution are poorly known but have been receiving increasing attention. Bivalve molluscs have been particularly studied in this regard for two reasons: their importance as commercial food species and the dominance of various bivalve species in marine ecosystems. The literature on the effects of pollution on the commercially important mytilids was recently reviewed by Roberts (1976). An examination of the levels of the metals copper, zinc and cadmium in the tissues of various marine organisms has been conducted by the Cockburn Sound Study Group. Oysters, mussels, crabs, and fish (both commercial and noncommercial) have been examined to date. If the programme is expanded or if an environmental monitoring programme is set up the bivalves Musculista glaberrima and Dosinia incisa merit consideration for inclusion. There are several reasons for this. Bivalves are known to concentrate pollutants (Roberts, 1976). The two species are widespread in Cockburn Sound and dominate the numbers and/or biomass of many stations. Both species are suspension feeders. They are thus ecologically important in transferring the food resources of the water column into tissue available for predators such as fish, echinoderms and other molluscs.

SUMMARY

1. Thirty stations in Cockburn Sound, Western Australia, were sampled with a 0.1 m^2 Van Veen grab.

2. One hundred thirty-eight species of 8 phyla were collected during the study. Molluscs, primarily bivalves, dominated the survey. They comprised 72.19% of all individuals collected and 89.56% of the biomass. Thirty-four species of molluscs were collected: 23 bivalves, 9 gastropods and 2 chitons.

3. The distributions of the dominant organisms were discussed. A consistent pattern of low densities and biomasses in most areas of the Sound emerged. Higher densities and biomasses were found in the mideastern region. A Simpson's index of diversity calculated for this area indicated there was a lower diversity than in the remainder of the Sound.

4. The community structure of the molluscs is discussed. The deep basin community characterized by _Musculista glaberrima_ and _Dosinia incisa_ is centered in the mideastern sector of the Sound. The shallow-water _Posidonia_ flats constitute a second major community that was not adequately sampled.

5. The molluscs were categorized by feeding types. Suspension feeders dominated, constituting 82.8% of all individuals and 89.5% of the molluscan biomass.

6. Densities of the four most abundant mollusc species were correlated with sediment grain size and water depth. The percentages of the variations in population densities explained

by these two factors varied from 18.0 in *Circe sulcata* to 36.6 in *Musculista glaberrima*.

7. The size frequency graphs of *Musculista glaberrima* and *Dosinia incisa* were both bimodal. The lifespan of *D. incisa* is not known. Two year classes were present in *M. glaberrima*.

8. The molluscan fauna of Cockburn Sound is compared to that of other areas. Particular attention was made to a comparison of the present fauna of the Sound to that reported for samples made in 1956 to 1960. No obvious changes attributable to pollution were encountered in the deep basin. The seagrass *Posidonia* has largely disappeared from the eastern shelf in the last 20 years. The disappearance is reflected in the molluscan fauna of the shelf.

9. Two species, *Musculista glaberrima* and *Dosinia incisa*, are recommended for any monitoring programme of the Sound in the future.

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Appendix 1. Sediment size fractions obtained from collections made in Cockburn Sound, Western Australia, during Frebruary and March 1978 using a Van Veen grab.

Size fraction	Station 16	17	21	27	32	38	44	59	60	64
<63μ(gm.)	20.2	0.0	1.5	116.1	145.7	166.4	160.1	18.4	81.3	21.1
>63μ(gm.)	13.3	0.7	14.1	41.6	70.1	29.1	97.0	25.6	10.7	28.3
>125μ(gm.)	85.4	35.5	64.4	84.9	74.9	55.6	25.8	44.1	34.7	61.2
>250μ(gm.)	71.3	203.1	161.8	111.7	79.9	59.9	14.5	48.7	36.1	94.2
>500μ(gm.)	10.3	42.2	98.3	32.5	17.1	35.6	10.5	128.1	7.8	118.3
>1000μ(gm.)	8.3	8.9	0.0	0.0	8.5	17.5	12.8	0.0	4.3	25.2
Ø	2.8	2.0	2.9	3.3	3.6	3.7	4.2	2.1	3.7	2.2

	70	72	85	87	92	93	101	103	113	117	119	122
< 63μ	268.8	67.4	156.5	139.4	147.4	110.1	187.2	179.0	191.1	216.1	174.0	228.3
> 63μ	45.1	10.7	53.5	55.7	88.0	100.1	41.0	91.0	69.8	37.0	24.5	18.8
> 125μ	32.2	34.9	23.6	24.5	45.7	31.7	16.5	43.2	23.5	8.3	5.8	5.2
> 250μ	18.8	44.1	14.0	14.5	26.6	22.3	10.1	20.7	18.4	5.6	3.8	5.2
> 500μ	10.4	7.8	8.2	8.8	18.0	14.8	7.0	17.0	9.3	2.5	2.0	2.9
>1000μ	18.5	4.5	6.8	8.5	13.9	8.8	4.5	12.9	6.8	1.8	1.9	2.7
Ø	4.5	3.5	4.3	4.3	4.0	4.0	4.5	4.1	4.3	4.7	4.7	4.6

Appendix 1. Sediment size fractions obtained from collections made in Cockburn Sound, Western Australia, during February and March 1978 using a Van Veen grab. (Continued)

Size fraction	Station 126	129	130	132	149	157	164	167
< 63μ	259.4	165.0	176.2	214.9	205.8	9.0	189.8	101.5
> 63μ	18.5	29.6	28.3	35.3	16.9	2.0	17.0	31.2
> 125μ	3.8	2.8	2.8	6.1	5.0	19.9	6.2	69.7
> 250μ	4.3	2.2	2.8	5.0	1.2	106.7	2.4	14.1
> 500μ	3.8	2.0	2.0	4.7	0.6	95.0	2.0	3.1
>1000μ	3.1	1.1	2.1	6.1	1.4	6.2	3.2	6.7
Ø	4.8	4.8	4.8	4.7	4.8	1.8	4.8	4.0

Appendix 2. Densities (no./m^2) and wet weights (gm/m^2) of all organisms collected at each station.

Species	Total no.	Mean no./m^2	Mean gm/m^2	16 Density no./m^2	16 Weight gm/m^2
Phylum Mollusca					
Class Amphineura					
Ischnochiton contractus (Reeve, 1847)	1	0.1	0.001	1.4	0.02
Ischnochiton sp.	2	0.2	0.04	-	-
Class Bivalvia					
Anomia cf. *trigonopsis* Hutton, 1877	254	28.1	21.37	-	-
Arcopagia (*Pinguitellina*) sp.	7	0.7	0.02	1.4	0.05
Chama ruderalis Lamarck, 1819	3	0.3	0.76	-	-
Circe sulcata Gray, 1838	149	16.2	16.82	7.1	4.35
Dosinia incisa (Reeve, 1850)	643	71.4	222.26	-	-
Epicodakia sp.	7	0.6	0.24	5.7	6.88
Fulvia aperta Bruguiere, 1789	1	0.1	0.08	-	-
Hiatella australis (Lamarck, 1818)	10	1.1	0.07	-	-
Laternula creccina (Reeve, 1860)	2	0.2	0.11	-	-
Lithophaga sp.	1	0.1	0.01	-	-
Mactra ovalina Lamarck, 1818	1	0.1	0.04	-	-
Malleus meridionalis Cotton, 1930	1	0.1	3.85	-	-
Megacardita incrassata (Sowerby, 1825)	10	1.1	12.38	-	-
Musculista glaberrima (Dunker, 1857)	869	96.2	48.41	7.1	4.41
Mytilus edulis planulatus Lamarck, 1819	3	0.3	6.61	-	-
Paphia crassisulca (Lamarck, 1818)	29	3.2	35.74	-	-
Phaxas cultellus Linnaeus, 1758	47	5.1	5.88	-	-
Solemya cf. *velesiana* Iredale, 1931	2	0.2	0.004	-	-
Tawera lagopus (Lamarck, 1818)	1	0.1	0.37	1.4	11.03
Tellina (*Tellinangulus*) sp.	1	0.1	0.02	-	-
Tellina (*Tellinides*) sp.	121	13.5	3.55	-	-
Theora lubrica (Gould, 1861)	1	0.1	0.002	-	-
Timoclea cardiocles (Lamarck, 1818)	3	0.3	0.03	-	-
Class Gastropoda					
Astralium tentorium (Thiele, 1930)	1	0.1	7.13	-	-
Bedeva paivae Crosse, 1864	2	0.2	0.25	-	-
Bulla botanica (Hedley, 1918)	4	0.4	0.15	-	-
Nassarius pauperus (Gould, 1850)	1	0.1	0.003	-	-
Pervicacia sp.	2	0.2	0.04	-	-
Polinices conicus (Lamarck, 1822)	1	0.1	0.50	-	-
Pyrene scripta (Lamarck, 1822)	1	0.1	0.02	1.4	0.57
Trigonostoma scalarina (Lamarck, 1822)	1	0.1	0.09	-	-
Vermetid sp.	3	0.2	0.12	-	-

Species	17 Density no./m^2	17 Weight gm/m^2	21 Density no./m^2	21 Weight gm/m^2	27 Density no./m^2	27 Weight gm/m^2	32 Density no./m^2	32 Weigh gm/m^2
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	2.5	.43	-	-	-	-	-	-
Bivalvia								
A. cf. trigonopsis	10.0	25.75	-	-	-	-	-	-
Arcopagia sp.	-	-	-	-	-	-	-	-
C. ruderalis	2.5	14.45	-	-	-	-	-	-
C. sulcata	-	-	5.0	0.59	20.0	7.88	6.7	0.87
D. incisa	-	-	-	-	3.3	0.26	3.3	30.13
Epicodakia sp.	-	-	-	-	-	-	-	-
F. aperta	-	-	-	-	-	-	-	-
H. australis	2.5	0.05	-	-	-	-	-	-
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	2.5	0.18	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	-	-	5.0	0.99	-	-	-	-
M. glaberrima	-	-	-	-	6.7	0.33	16.7	3.43
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	-	-	-	-	-	-	-	-
P. cultellus	-	-	5.0	0.40	3.3	1.05	-	-
S. velesiana	-	-	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	-	-	-	-	3.3	0.08	6.7	0.16
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	2.5	0.40	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	2.5	0.09	-	-	-	-
Pervicacia sp.	-	-	-	-	3.3	0.52	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	-	-	-	-
Vermetid sp.	7.5	3.55	-	-	-	-	-	-

Species	38 Density no./m²	38 Weight gm/m²	44 Density no./m²	44 Weight gm/m²	59 Density no./m²	59 Weight gm/m²	60 Density no./m²	60 Weigh gm/m²
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	3.3	.69
Bivalvia								
A. cf. trigonopsis	10.0	6.66	-	-	-	-	-	-
Arcopagia sp.	-	-	-	-	-	-	-	-
C. ruderalis	3.3	7.47	-	-	-	-	-	-
C. sulcata	-	-	123.3	163.87	-	-	-	-
D. incisa	-	-	13.3	8.30	-	-	-	-
Epicodakia sp.	-	-	-	-	3.3	0.03	3.3	0.07
F. aperta	-	-	-	-	-	-	-	-
H. australis	-	-	-	-	-	-	-	-
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	3.3	115.43
M. incrassata	16.7	167.03	-	-	6.7	187.47	-	-
M. glaberrima	-	-	60.0	21.43	10.0	0.02	6.7	0.04
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	-	-	-	-	3.3	0.85	-	-
P. cultellus	13.3	0.99	-	-	10.0	0.81	-	-
S. velesiana	3.3	0.06	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	-	-	-	-	-	-	3.3	0.28
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	3.3	213.83
B. paivae	-	-	-	-	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	-	-	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	-	-	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	64 Density no./m²	64 Weight gm/m²	70 Density no./m²	70 Weight gm/m²	72 Density no./m²	72 Weight gm/m²	85 Density no./m²	85 Weight gm/m²
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	-	-
Bivalvia								
A. cf. trigonopsis	3.3	13.10	-	-	-	-	-	-
Arcopagia sp.	3.3	0.14	-	-	-	-	3.3	0.02
C. ruderalis	3.3	0.91	-	-	-	-	-	-
C. sulcata	3.3	0.16	3.3	2.53	-	-	-	-
D. incisa	-	-	16.7	8.03	-	-	16.7	0.46
Epicodakia sp.	3.3	0.05	-	-	-	-	-	-
F. aperta	-	-	-	-	-	-	-	-
H. australis	-	-	-	-	-	-	-	-
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	3.3	15.93	-	-	-	-	-	-
M. glaberrima	6.7	0.02	33.3	11.17	-	-	46.7	0.31
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	10.0	1.74	-	-	3.3	0.35	-	-
P. cultellus	3.3	0.13	-	-	-	-	10.0	0.89
S. velesiana	-	-	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	3.3	0.67	-	-	-	-	10.0	1.79
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	-	-	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	-	-	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarima	-	-	-	-	-	-	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	87 Density no./m^2	87 Weight gm/m^2	92 Density no./m^2	92 Weight gm/m^2	93 Density no./m^2	93 Weight gm/m^2	101 Density no./m^2	101 Weight gm/m^2
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	-	-
Bivalvia								
A. cf. *trigonopsis*	-	-	30.0	30.23	16.7	17.53	-	-
Arcopagia sp.	-	-	-	-	-	-	-	-
C. ruderalis	-	-	-	-	-	-	-	-
C. sulcata	-	-	103.3	99.27	126.7	141.13	3.3	4.80
D. incisa	-	-	650.0	936.60	666.7	840.32	13.3	64.03
Epicodakia sp.	-	-	-	-	-	-	-	-
F. aperta	-	-	-	-	-	-	-	-
H. australis	-	-	3.3	0.26	-	-	-	-
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	-	-	-	-	-	-	-	-
M. glaberrima	326.7	1.68	183.3	138.81	136.7	105.92	46.7	19.44
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	-	-	6.7	30.01	-	-	6.7	60.02
P. cultellus	-	-	6.7	16.27	-	-	6.7	7.61
S. velesiana	-	-	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	3.3	0.33	26.7	5.98	10.0	2.13	20.0	5.14
T. lubrica	-	-	-	-	-	-	3.3	0.05
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	3.3	7.0	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	3.3	0.54	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	-	-	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	103 Density no./m²	103 Weight gm/m²	113 Density no./m²	113 Weight gm/m²	117 Density no./m²	117 Weight gm/m²	119 Density no./m²	119 Weigh gm/m²
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	-	-
Bivalvia								
A. cf. trigonopsis	-	-	13.3	13.73	10.0	4.53	-	-
Arcopagia sp.	-	-	3.3	0.05	-	-	-	-
C. ruderalis	-	-	-	-	-	-	-	-
C. sulcata	-	-	16.7	7.60	-	-	-	-
D. incisa	96.7	417.43	60.0	144.60	20.0	596.31	-	-
Epicodakia sp.	-	-	-	-	-	-	-	-
F. aperta	-	-	-	-	3.3	2.47	-	-
H. australis	-	-	-	-	-	-	6.7	0.42
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	-	-	-	-	-	-	-	-
M. glaberrima	36.7	20.90	93.3	6.07	3.3	0.29	-	-
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	6.7	122.17	3.3	2.30	10.0	173.67	3.3	138.43
P. cultellus	16.7	40.27	-	-	3.3	0.32	6.7	1.05
S. velesiana	-	-	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	3.3	0.36	53.3	26.00	3.3	1.80	-	-
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	-	-	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	-	-	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	3.3	2.57	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	122 Density no./m^2	122 Weight gm/m^2	126 Density no./m^2	126 Weight gm/m^2	129 Density no./m^2	129 Weight gm/m^2	130 Density no./m^2	130 Weigh gm/m^2
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	-	-
Bivalvia								
A. cf. trigonopsis	-	-	276.7	211.50	473.3	317.97	-	-
Arcopagia sp.	-	-	-	-	-	-	-	-
C. ruderalis	-	-	-	-	-	-	-	-
C. sulcata	-	-	10.0	8.97	16.7	27.87	6.7	8.47
D. incisa	13.3	228.73	203.3	1551.24	216.7	1049.04	86.7	228.07
Epicodakia sp.	-	-	-	-	-	-	-	-
F. aperta	-	-	-	-	-	-	-	-
H. australis	-	-	3.3	0.18	-	-	-	-
L. creccina	-	-	6.7	3.23	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	-	-
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	-	-	-	-	-	-	-	-
M. glaberrima	6.7	2.13	246.7	193.47	640.0	507.82	290.0	252.37
M. edulis	-	-	-	-	-	-	-	-
P. crassisulca	6.7	233.33	10.0	31.73	3.3	31.20	10.0	215.64
P. cultellus	3.3	1.38	13.3	26.80	16.7	43.80	10.0	30.23
S. velesiana	-	-	-	-	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	-	-	-	-
Tellina sp. 2	-	-	-	-	-	-	-	-
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	-	-	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	-	-	-	-	-	-
B. botanica	-	-	-	-	-	-	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	-	-	-	-
P. conicus	-	-	-	-	-	-	3.3	14.96
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	-	-	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	132 Density no./m²	132 Weight gm/m²	149 Density no./m²	149 Weight gm/m²	157 Density no./m²	157 Weight gm/m²	164 Density no./m²	164 Weigh gm/m²
Mollusca								
Amphineura								
I. contractus	-	-	-	-	-	-	-	-
Ischnochiton sp.	-	-	-	-	-	-	-	-
Bivalvia								
A. cf. trigonopsis	-	-	-	-	-	-	-	-
Arcopagia sp.	-	-	-	-	6.7	0.43	-	-
C. ruderalis	-	-	-	-	-	-	-	-
C. sulcata	23.3	19.40	3.3	0.32	3.3	0.02	3.3	6.47
D. incisa	26.7	282.33	10.0	213.07	-	-	26.7	68.87
Epicodakia sp.	-	-	-	-	-	-	3.3	0.06
F. aperta	-	-	-	-	-	-	-	-
H. australis	-	-	-	-	3.3	0.17	13.3	1.05
L. creccina	-	-	-	-	-	-	-	-
Lithophaga sp.	-	-	-	-	-	-	-	-
M. ovalina	-	-	-	-	-	-	3.3	1.26
M. meridionalis	-	-	-	-	-	-	-	-
M. incrassata	-	-	-	-	-	-	-	-
M. glaberrima	6.7	4.63	593.3	146.2	-	-	83.3	11.32
M. edulis	-	-	-	-	10.0	198.37	-	-
P. crassisulca	3.3	29.20	-	-	-	-	10.0	1.54
P. cultellus	-	-	13.3	1.42	3.3	2.30	3.3	0.50
S. velesiana	-	-	3.3	0.05	-	-	-	-
T. lagopus	-	-	-	-	-	-	-	-
Tellina sp. 1	-	-	-	-	3.3	0.51	-	-
Tellina sp. 2	-	-	153.3	33.70	-	-	96.7	25.70
T. lubrica	-	-	-	-	-	-	-	-
T. cardiocles	-	-	-	-	10.0	0.88	-	-
Gastropoda								
A. tentorium	-	-	-	-	-	-	-	-
B. paivae	-	-	-	-	-	-	-	-
B. botanica	-	-	-	-	13.3	4.43	-	-
N. pauperus	-	-	-	-	-	-	-	-
Pervicacia sp.	-	-	-	-	-	-	-	-
P. conicus	-	-	-	-	-	-	-	-
P. scripta	-	-	-	-	-	-	-	-
T. scalarina	-	-	-	-	-	-	-	-
Vermetid sp.	-	-	-	-	-	-	-	-

Species	Density no./m^2	Weight gm/m^2
Mollusca		
Amphineura		
I. contractus	-	-
Ischnochiton sp.	-	-
Bivalvia		
A. cf. trigonopsis	-	-
Arcopagia sp.	3.3	0.04
C. ruderalis	-	-
C. sulcata	-	-
D. incisa	-	-
Epicodakia sp.	-	-
F. aperta	-	-
H. australis	-	-
L. creccina	-	-
Lithophaga sp.	-	-
M. ovalina	-	-
M. meridionalis	-	-
M. incrassata	-	-
M. glaberrima	-	-
M. edulis	-	-
P. crassisulca	-	-
P. cultellus	6.7	0.21
S. velesiana	-	-
T. lagopus	-	-
Tellina sp. a	-	-
Tellina sp. 2	6.7	0.8
T. lubrica	-	-
T. cardiocles	-	-
Gastropoda		
A. tentorium	-	-
B. paivae	-	-
B. botanica	-	-
N. pauperus	-	-
Pervicacia sp.	-	-
P. conicus	-	-
P. scripta	-	-
T. scalarina	-	-
Vermetid sp.	-	-

16

Species	Total no.	Mean no./m^2	Mean mg/m^2	Density no/m^2	Weight gm/m^2
Phylum Arthropoda					
Class Crustacea					
Alpheid sp.	1	0.1	159	-	-
cf. Alpheus sp.	1	0.1	2	-	-
Apseudes australis Haswell	1	0.9	10	-	-
cf. Balanus sp.	218	24.0	2082	5.7	0.06
Caprella penantis	3	0.3	0.2	8.6	0.01
cf. Ceradocus sp.	35	2.6	2	50.0	0.04
cf. Ceradocus sp.	3	0.3	5	-	-
Metapenaeus cf. dalli	1	0.1	36	-	-
Pagurid sp.	1	0.1	1	-	-
Pagurid sp.	2	0.2	4	-	-
Palaemon sp.	1	0.1	19	-	-
Paratanais ignotus	2	0.2	0.2	1.4	0.003
Phlyxia intermedia	1	0.1	9	1.4	0.28
Pilumnus sp.	3	0.3	121	-	-
Pisidia dispar (Stimpson,)	2	0.2	5	-	-
Polyonyx transversus (Haswell,)	1	0.1	35	-	-
Portunus rugosus	2	0.2	262	-	-
Squilla laevis	1	0.1	123	-	-
Tanaid sp.	2	1.9	10	1.4	0.004
Thalamita sima	1	1.0	1036	1.4	1.40
cf. Waldeckia sp.	2	0.2	36	-	-
Phylum Echinodermata					
Class Asteroidea					
Astropecten preissi Muller & Troschel, 1843	3	.3	4.06	-	-
~~Coscinasterias calamaria~~ (Gray, 1840)	4	.4	1.22	-	-
Class Ophiuroidea					
Amphioplus depressus (Ljungman, 1867)-	7	.7	0.02	-	-
Amphipholis squamata (Delle Chiaje, 1828)	1	.1	0.0003	-	-
Class Echinoidea					
Echinocardium cordatum (Pennant, 1777)	1	.0	5.13	-	-
Nudechinus scotiopremnus H.L. Clark, 1912	5	.5	1.75	-	-
Temnopleurus michaelseni (Dodenlein, 1914)	44	.8	1.39	-	-

	17		21		27	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	40.0	2.45	-	-	-	-
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	2.5	0.02	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	2.5	0.57	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	2.5	0.51	-	-	-	-
Pisidia dispar	2.5	0.02	2.5	0.12	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	-	-	-	-
Thalamita sima	-	-	-	-	-	-
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	2.5	15.68	-	-
Coscinasterias calamaria	2.5	13.7	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	5.0	0.22	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	2.5	5.98	-	-
Nudechinus scotiopremnus	5.0	52.55	-	-	-	-
Temnopleurus michaelseni	-	-	5.0	0.7	-	-

	32		.38		44	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	-	-	-	-	-	-
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	6.7	0.06	-	-
Thalamita sima	-	-	-	-	3.3	1.73
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	3.3	0.11
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	-	-
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	-	-	-	-	-	-

	59		60		64	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. *Alpheus* sp.	-	-	-	-	3.3	0.07
Apseudes australis	-	-	6.7	0.11	-	-
cf. *Balanus* sp.	20.0	0.24	-	-	20.0	0.55
Caprella penantis	-	-	-	-	-	-
cf. *Ceradocus* sp.	-	-	-	-	-	-
cf. *Ceradocus* sp.	-	-	6.7	0.15	-	-
Metapenaeus cf. *dalli*	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	6.7	0.12	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	3.3	0.003	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	3.3	0.24
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	3.3	0.03	-	-	-	-
Thalamita sima	-	-	3.3	0.003	-	-
cf. *Waldeckia* sp.	-	-	6.7	0.05	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	-	-
Nudechinus scotiopremnus	-	-	10.0	0.09	-	-
Temnopleurus michaelseni	-	-	53.3	3.07	-	-

	70		72		85	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	-	-	-	-	-	-
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	-	-	23.3	0.11
Thalamita sima	-	-	-	-	-	-
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	3.3	105.83	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	3.3	0.05	-	-	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	3.3	4.87	-	-	-	-
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	-	-	-	-	-	-

	87		92		93	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	-	-	-	-	3.3	5.07
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	3.3	3.73
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	23.3	0.08	-	-	-	-
Thalamita sima	-	-	-	-	3.3	6.17
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	6.7	0.22
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	3.3	12.13
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	-	-	3.3	4.50	-	-

	101		103		113	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	-	-	-	-	103.3	8.80
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	3.3	2.87	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	3.3	4.13
Squilla laevis	3.3	3.70	-	-	-	-
Tanaid sp.	-	-	-	-	-	-
Thalamita sima	-	-	-	-	-	-
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	10.0	50.27
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	-	-	-	-	3.3	2.13

	117 Density no./m^2	117 Weight gm/m^2	119 Density no./m^2	119 Weight gm/m^2	122 Density no./m^2	122 Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	3.3	4.77	-	-
cf. *Alpheus* sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. *Balanus* sp.	-	-	-	-	-	-
Caprella penantis	-	-	-	-	-	-
cf. *Ceradocus* sp.	-	-	-	-	-	-
cf. *Ceradocus* sp.	-	-	-	-	-	-
Metapenaeus cf. *dalli*	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	3.3	1.05	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	-	-	-	-
Thalamita sima	-	-	-	-	-	-
cf. *Waldeckia* sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	-	-
Amphipholis squamata	3.3	0.01	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	3.3	27.2
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	-	-	-	-	-	-

	126		129		130	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	-	-
cf. Balanus sp.	56.7	3.32	470.0	44.43	-	-
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	-	-
Metapenaeus cf. dalli	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	-	-	-	-
Thalamita sima	-	-	-	-	-	-
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	-	-	-	-
Class Ophiuroidea						
Amphioplus depressus	3.3	0.10	-	-	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	-	-
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	23.3	5.20	50.0	24.13	-	-

	132		149		157	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda						
Class Crustacea						
Alpheid sp.	-	-	-	-	-	-
cf. Alpheus sp.	-	-	-	-	-	-
Apseudes australis	-	-	-	-	20.0	0.18
cf. Balanus sp.	-	-	-	-	-	-
Caprella penantis	-	-	-	-	-	-
cf. Ceradocus sp.	-	-	-	-	26.7	0.01
cf. Ceradocus sp.	-	-	-	-	3.3	0.01
Metapenaeus cf. dalli	-	-	-	-	3.3	1.09
Pagurid sp.	-	-	-	-	-	-
Pagurid sp.	-	-	-	-	-	-
Palaemon sp.	-	-	-	-	-	-
Paratanais ignotus	-	-	-	-	-	-
Phlyxia intermedia	-	-	-	-	-	-
Pilumnus sp.	-	-	-	-	-	-
Pisidia dispar	-	-	-	-	-	-
Polyonyx transversus	-	-	-	-	-	-
Portunus rugosus	-	-	-	-	-	-
Squilla laevis	-	-	-	-	-	-
Tanaid sp.	-	-	-	-	-	-
Thalamita sima	-	-	3.3	1.13	10.0	14.67
cf. Waldeckia sp.	-	-	-	-	-	-
Phylum Echinodermata						
Class Asteroidea						
Astropecten preissi	-	-	-	-	-	-
Coscinasterias calamaria	-	-	3.3	21.37	6.7	1.50
Class Ophiuroidea						
Amphioplus depressus	-	-	-	-	-	-
Amphipholis squamata	-	-	-	-	-	-
Class Echinoidea						
Echinocardium cordatum	-	-	-	-	-	-
Nudechinus scotiopremnus	-	-	-	-	-	-
Temnopleurus michaelseni	3.3	0.61	3.3	1.37	-	-

	164		167	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Arthropoda				
Class Crustacea				
Alpheid sp.	-	-	-	-
cf. *Alpheus* sp.	-	-	-	-
Apseudes australis	-	-	-	-
cf. *Balanus* sp.	-	-	-	-
Caprella penantis	-	-	-	-
cf. *Ceradocus* sp.	-	-	-	-
cf. *Ceradocus* sp.	-	-	-	-
Metapenaeus cf. *dalli*	-	-	-	-
Pagurid sp.	-	-	-	-
Pagurid sp.	-	-	-	-
Palaemon sp.	-	-	-	-
Paratanais ignotus	-	-	-	-
Phlyxia intermedia	-	-	-	-
Pilumnus sp.	-	-	-	-
Pisidia dispar	-	-	-	-
Polyonyx transversus	-	-	-	-
Portunus rugosus	-	-	-	-
Squilla laevis	-	-	-	-
Tanaid sp.	-	-	-	-
Thalamita sima	-	-	-	-
cf. *Waldeckia* sp.	-	-	-	-
Phylum Echinodermata				
Class Asteroidea				
Astropecten preissi	3.3	0.327	-	-
Coscinasterias calamaria	-	-	-	-
Class Ophiuroidea				
Amphioplus depressus	-	-	-	-
Amphipholis squamata	-	-	-	-
Class Echinoidea				
Echinocardium cordatum	6.7	53.43	-	-
Nudechinus scotiopremnus	-	-	-	-
Temnopleurus michaelseni	-	-	-	-

	Total no.	Mean Density no./m^2	Mean Weight gm/m^2	16 Density no./m^2	Weight gm/m^2
Phylum Coelenterata					
Class Anthozoa					
order Ceriantipatharia *Cerianthus* sp. (a)	46	5.0	9.37	1.4	7.17
Cerianthus sp. (b)	4	0.4	0.76	-	-
order Pennatulacea (a)	21	2.3	0.16	-	-
(b)	44	3.8	9.11	1.4	5.93
Phylum Nemertea	20	2.2	1.41	-	-
Phylum Phoronida					
Phoronis cf. *australis*	6	0.7	0.07	-	-
Phylum Sipunculida (a)	1	0.1	0.08	-	-
(b)	1	0.1	0.39	-	-
Phylum Tunicata					
Class Ascidiacea (a)	3	0.3	0.42	-	-
(b)	1	0.1	0.38	-	-
(c)	5	0.6	1.14	-	-
(d)	3	0.3	0.92	-	-
(e)	5	0.6	0.79	-	-
Phylum Vertebrata					
Class Osteichthyes *Callogobius mucosus*	1	0.1	0.03	-	-

	17		21		27	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia <u>Cerianthus</u> sp.(a)	-	-	-	-	-	-
<u>Cerianthus</u> sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	3.3	17.53
Phylum Nemertea	-	-	-	-	-	-
Phylum Phoronida						
<u>Phoronis</u> cf. <u>australis</u>	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	5.0	6.20	-	-
(b)	-	-	-	-	-	-
(c)	-	-	10.0	20.92	3.3	7.47
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes <u>Callogobius</u> <u>mucosus</u>	-	-	-	-	-	-

	32		38		44	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	-	-	-	-	6.7	6.43
Cerianthus sp.(b)	3.3	18.73	-	-	-	-
order Pennatulacea (a)	-	-	-	-	-	-
(b)	6.7	32.57	-	-	-	-
Phylum Nemertea	3.3	0.49	6.7	0.65	-	-
Phylum Phoronida						
Phoronis cf. *australis*	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	59		60		64	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp. (a)	-	-	-	-	-	-
Cerianthus sp. (b)	-	-	-	-	-	-
order Pennatulacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Nemertea	-	-	-	-	-	-
Phylum Phoronida						
Phoronis cf. *australis*	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	3.3	11.73
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	70		72		85	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	-	-	-	-	13.3	24.93
Cerianthus sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	3.3	0.04	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Nemertea	3.3	0.90	-	-	6.7	0.59
Phylum Phoronida						
Phoronis cf. *australis*	-	-	-	-	3.3	0.58
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	87		92		93	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	-	-	-	-	3.3	83.00
Cerianthus sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	-	-	6.7	0.08	6.7	0.67
(b)	-	-	13.3	7.33	6.7	33.87
Phylum Nemertea	-	-	3.3	0.28	6.7	1.47
Phylum Phoronida						
Phoronis cf. *australis*	-	-	3.3	0.11	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	101 Density no./m²	101 Weight gm/m²	103 Density no./m²	103 Weight gm/m²	113 Density no./m²	113 Weight gm/m²
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	33.3	25.03	3.3	4.53	23.3	14.77
Cerianthus sp.(b)	3.3	1.06	3.3	0.85	3.3	2.30
order Pennatulacea (a)	3.3	0.14	3.3	0.45	10.0	0.67
(b)	6.7	17.17	6.7	3.60	-	-
Phylum Nemertea	3.3	1.15	3.3	0.77	10.0	1.73
Phylum Phoronida						
Phoronis cf. *australis*	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	3.3	11.40	-	-	-	-
(c)	-	-	-	-	-	-
(d)	6.7	24.80	-	-	3.3	2.83
(e)	-	-	-	-	3.3	5.10
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	117		119		122	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	33.3	32.70	13.3	7.63	-	-
Cerianthus sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	3.3	0.28	3.3	0.24	10.0	0.29
(b)	6.7	22.00	3.3	2.97	36.7	84.63
Phylum Nemertea	-	-	3.3	2.30	3.3	1.05
Phylum Phoronida						
Phoronis cf. *australis*	3.3	0.30	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	3.3	3.90	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	126		129		130	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia *Cerianthus* sp.(a)	10.0	15.23	-	-	-	-
Cerianthus sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	6.7	0.29	-	-	-	-
(b)	6.7	24.57	6.7	2.64	3.3	5.27
Phylum Nemertea	6.7	25.7	3.3	1.11	-	-
Phylum Phoronida						
Phoronis cf. *australis*	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	3.3	6.53
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes *Callogobius mucosus*	-	-	-	-	-	-

	132		149		157	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weigh gm/m^2
Phylum Coelenterata						
Class Anthozoa						
order Ceriantipatharia Cerianthus sp.(a)	-	-	6.7	43.13	-	-
Cerianthus sp.(b)	-	-	-	-	-	-
order Pennatulacea (a)	-	-	-	-	-	-
(b)	3.3	10.93	3.3	2.40	-	-
Phylum Nemertea	-	-	-	-	-	-
Phylum Phoronida						
Phoronis cf. australis	-	-	-	-	-	-
Phylum Sipunculida (a)	-	-	-	-	3.3	2.27
(b)	-	-	-	-	-	-
Phylum Tunicata						
Class Ascidiacea (a)	-	-	-	-	-	-
(b)	-	-	-	-	-	-
(c)	-	-	-	-	-	-
(d)	-	-	-	-	-	-
(e)	-	-	-	-	-	-
Phylum Vertebrata						
Class Osteichthyes Callogobius mucosus	-	-	-	-	3.3	1.0]

	164		167	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Coelenterata				
Class Anthozoa				
order Ceriantipatharia *Cerianthus* sp.(a)	3.3	16.63	-	-
Cerianthus sp.(b)	-	-	-	-
order Pennatulacea (a)	6.7	0.74	6.7	0.84
(b)	-	-	-	-
Phylum Nemertea	3.3	4.10	-	-
Phylum Phoronida				
Phoronis cf. *australis*	-	-	10.0	1.00
Phylum Sipunculida (a)	-	-	-	-
(b)	-	-	-	-
Phylum Tunicata				
Class Ascidiacea (a)	-	-	-	-
(b)	-	-	-	-
(c)	-	-	-	-
(d)	-	-	-	-
(e)	10.00	14.67	-	-
Phylum Vertebrata				
Class Osteichthyes *Callogobius mucosus*	-	-	-	-

			Total no.	Mean Weight mg/m^2	Mean Density $no./m^2$	16 Density $no./m^2$	Weight gm/m^2
Phylum Annelida							
Class Polychaeta							
Polynoidae	sp. A		2	7	0.2	-	-
	B		3	4	0.3	1.4	.0206
Sigalionidae	sp. A		1	40	0.1	-	-
	B		1	1	0.1	-	-
	C		1	39	0.1	-	-
Phyllodocidae	sp. A		1	0.3	0.1	-	-
Nereidae	sp. A		2	0.3	0.2	-	-
	B	<u>Platynereis</u> sp.	1	0.5	0.05	1.4	.015
	C		1	0	0.05	1.4	.001
	D		1	0.5	0.05	1.4	.014
	E		1	0.2	0.1	-	-
	F	<u>Eunereis</u> sp(?)	1	91	0.1	-	-
	G	<u>Nereis</u> sp.	2	6	0.2	-	-
Nephytidae	sp. A		2	6	0.2	1.4	.004
	B		1	0.3	0.1	-	-
	C		36	36	3.5	11.4	.683
Eunicidae	sp. A	<u>Eunice</u> sp.	6	1	0.6	1.4	.003
	B		1	0.9	0.05	1.4	.027
	C	<u>Marphysa</u> sp.	1	1	0.1	-	-
Onuphidae	sp. A	<u>Onuphis</u> sp.	7	9	0.5	5.7	.025
	B	<u>Diopatra</u> sp.	2	122	0.2	-	-
	C	<u>Diopatra</u> sp.	3	42	0.2	-	-
	D		2	59	0.2	-	-
Lumbrinereidae	sp. A		5	2	0.5	1.4	.004
	B		74	144	7.7	11.4	.070
	C		1	267	0.05	1.4	0.80
Spionidae	sp. A		1	0.5	0.2	-	-
	B		2	2	0.2	1.4	.022
	C		1	1	0.05	1.4	.035
	D	<u>Prionospio</u> sp.	5	4	0.6	-	-
	E		2	2	0.2	-	-
	F	<u>Prionospio</u> sp.	4	2	0.4	-	-
Cirratulidae	sp. A		1	0.2	0.05	1.4	.005
	B		2	1	0.2	-	-
Orbiniidae	sp. A		4	54	0.4	-	-
Opheliidae	sp. A	<u>Armandia</u> sp.	2	2	0.2	1.4	.020
Capitellidae	sp. A		2	0.9	0.2	-	-
	B		2	3	0.2	-	-
Maldanidae	sp. A		10	108	1.0	-	-
Ampharetidae	A		3	15	0.1	1.4	.012
	B		2	1	0.2	-	-
	C		4	23	0.4	-	-
	D		1	4	0.1	-	-
	E		1	1	0.1	-	-
Terebellidae	sp. A		5	370	0.6	-	-
	B		2	5	0.2	-	-
	C		3	2	0.3	-	-
	D		9	230	1.0	-	-
Sabellidae	sp. A		1	1	0.1	-	-
	B		1	0.5	0.1	-	-
	C		1	4	0.1	-	-
Serpulidae	sp. A		1	0	0.05	1.4	.001
	B		3	118	0.2	-	-
	C		7	280	0.6	-	-

	17		21		27	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida						
Class Polychaeta						
Polynoidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Sigalionidae sp. A	2.5	1.213	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Phyllodocidae sp. A	-	-	-	-	-	-
Nereidae sp. A	-	-	-	-	-	-
B <u>Platynereis</u> sp.	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F <u>Eunereis</u> sp(?)	-	-	-	-	-	-
G <u>Nereis</u> sp.	-	-	-	-	-	-
Nephytidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Eunicidae sp. A <u>Eunice</u> sp.	-	-	2.5	.006	-	-
B	-	-	-	-	-	-
C <u>Marphysa</u> sp.	-	-	2.5	.037	-	-
Onuphidae sp. A <u>Onuphis</u> sp.	-	-	-	-	-	-
B <u>Diopatra</u> sp.	5.0	3.675	-	-	-	-
C <u>Diopatra</u> sp.	-	-	7.5	1.275	-	-
D	-	-	5.0	1.785	-	-
Lumbrinereidae sp. A	-	-	-	-	-	-
B	2.5	.013	-	-	-	-
C	-	-	-	-	-	-
Spionidae sp. A	2.5	.015	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D <u>Prionospio</u> sp.	-	-	-	-	-	-
E	-	-	-	-	-	-
F <u>Prionospio</u> sp.	-	-	-	-	-	-
Cirratulidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Orbiniidae sp. A	-	-	-	-	-	-
Opheliidae sp. A <u>Armandia</u> sp.	-	-	-	-	-	-
Capitellidae sp. A	-	-	-	-	-	-
B	-	-	5.0	.080	-	-
Maldanidae sp. A	-	-	5.0	.170	-	-
Ampharetidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	2.5	.135	-	-
E	-	-	2.5	.031	-	-
Terebellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	5.0	.030	-	-	-	-
D	30.0	6.925	-	-	-	-
Sabellidae sp. A	-	-	-	-	-	-
B	2.5	.016	-	-	-	-
C	-	-	-	-	-	-
Serpulidae sp. A	-	-	-	-	-	-
B	7.5	3.550	-	-	-	-
C	12.5	5.675	-	-	-	-

			32		38		44	
			Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida								
Class Polychaeta								
Polynoidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Sigalionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Phyllodocidae	sp. A		-	-	-	-	-	-
Nereidae	sp. A		-	-	-	-	-	-
	B	*Platynereis* sp.	-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	3.3	.005	-	-
	F	*Eunereis* sp.(?)	-	-	-	-	-	-
	G	*Nereis* sp.	-	-	-	-	-	-
Nephytidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Eunicidae	sp. A	*Eunice* sp.	-	-	-	-	-	-
	B		-	-	-	-	-	-
	C	*Marphysa* sp.	-	-	-	-	-	-
Onuphidae	sp. A	*Onuphis* sp.	-	-	-	-	-	-
	B	*Diopatra* sp.	-	-	-	-	-	-
	C	*Diopatra* sp.	-	-	-	-	-	-
	D		-	-	-	-	-	-
Lumbrinereidae	sp. A		-	-	-	-	-	-
	B		-	-	6.7	.031	-	-
	C		-	-	-	-	-	-
Spionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D	*Prionospio* sp.	-	-	-	-	-	-
	E		-	-	3.3	.025	-	-
	F	*Prionospio* sp.	-	-	-	-	-	-
Cirratulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Orbiniidae	sp. A		-	-	-	-	-	-
Opheliidae	sp. A	*Armandia* sp.	-	-	-	-	-	-
Capitellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Maldanidae	sp. A		-	-	-	-	-	-
Ampharetidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
Terebellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
Sabellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Serpulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-

			59		60		64	
			Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida								
Class Polychaeta								
Polynoidae	sp. A		3.3	.091	-	-	-	-
	B		-	-	-	-	6.7	.113
Sigalionidae	sp. A		-	-	-	-	-	-
	B		-	-	3.3	.041	-	-
	C		-	-	-	-	-	-
Phyllodocidae	sp. A		-	-	-	-	-	-
Nereidae	sp. A		3.3	.004	-	-	-	-
	B	<u>Platynereis</u> sp.	-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
	F	<u>Eunereis</u> sp(?)	-	-	-	-	-	-
	G	<u>Nereis</u> sp.	-	-	-	-	-	-
Nephytidae	sp. A		-	-	3.3	.170	-	-
	B		-	-	-	-	3.3	.010
	C		-	-	3.3	.173	10.0	.230
Eunicidae	sp. A	<u>Eunice</u> sp.	-	-	13.3	.029	-	-
	B		-	-	-	-	-	-
	C	<u>Marphysa</u> sp.	-	-	-	-	-	-
Onuphidae	sp. A	<u>Onuphis</u> sp.	-	-	6.7	.233	3.3	.015
	B	<u>Diopatra</u> sp.	-	-	-	-	-	-
	C	<u>Diopatra</u> sp.	-	-	-	-	-	-
	D		-	-	-	-	-	-
Lumbrinereidae	sp. A		3.3	.009	3.3	.007	-	-
	B		16.667	.091	110.0	.547	13.3	.082
	C		-	-	-	-	-	-
Spionidae	sp. A		-	-	-	-	-	-
	B		-	-	3.3	.041	-	-
	C		-	-	-	-	-	-
	D	<u>Prionospio</u> sp.	-	-	-	-	-	-
Cirratulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Orbiniidae	sp. A		-	-	-	-	-	-
Opheliidae	sp. A	<u>Armandia</u> sp.	-	-	-	-	-	-
Capitellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Maldanidae	sp. A		-	-	-	-	-	-
Ampharetidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
Terebellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
Sabellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		3.3	.131	-	-	-	-
Serpulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	6.7	2.73

			70		72		85	
			Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida								
Class Polychaeta								
Polynoidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Sigalionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Phyllodocidae	sp. A		-	-	-	-	-	-
Nereidae	sp. A		-	-	-	-	-	-
	B	Platynereis sp.	-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
	F	Eunereis sp.(?)	-	-	-	-	-	-
	G	Nereis sp.	-	-	-	-	-	-
Nephytidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Eunicidae	sp. A	Eunice sp.	-	-	-	-	-	-
	B		-	-	-	-	-	-
	C	Marphysa sp.	-	-	-	-	-	-
Onuphidae	sp. A	Onuphis sp.	-	-	-	-	-	-
	B	Diopatra sp.	-	-	-	-	-	-
	C	Diopatra sp.	-	-	-	-	-	-
	D		-	-	-	-	-	-
Lumbrinereidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Spionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D	Prionospio sp.	-	-	-	-	-	-
	E		-	-	-	-	-	-
	F	Prionospio sp.	-	-	-	-	-	-
Cirratulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Orbiniidae	sp. A		-	-	-	-	-	-
Opheliidae	sp. A	Armandia sp.	-	-	-	-	-	-
Capitellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Maldanidae	sp. A		3.3	.0270	3.3	.0330	-	-
Ampharetidae	sp. A		6.7	.413	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
Terebellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
Sabellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Serpulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-

	87 Density no./m^2	87 Weight gm/m^2	92 Density no./m^2	92 Weight gm/m^2	93 Density no./m^2	93 Weight gm/m^2
Phylum Annelida						
Class Polychaeta						
Polynoidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Sigalionidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Phyllodocidae sp. A	-	-	-	-	-	-
Nereidae sp. A	3.3	.005	-	-	-	-
B _Platynereis_ sp.	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F _Eunereis_ sp(?)	-	-	-	-	-	-
G _Nereis_ sp.	-	-	-	-	-	-
Nephytidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Eunicidae sp. A _Eunice_ sp.	-	-	-	-	-	-
B	-	-	-	-	-	-
C _Marphysa_ sp.	-	-	-	-	-	-
Onuphidae sp. A _Onuphis_ sp.	-	-	-	-	-	-
B _Diopatra_ sp.	-	-	-	-	-	-
C _Diopatra_ sp.	-	-	-	-	-	-
D	-	-	-	-	-	-
Lumbrinereidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Spionidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D _Prionospio_ sp.	-	-	-	-	-	-
E	3.3	.023	-	-	-	-
F _Prionospio_ sp.	3.3	.013	-	-	-	-
Cirratulidae sp. A	-	-	-	-	-	-
B	-	-	3.3	.011	-	-
Orbiniidae sp. A	-	-	-	-	-	-
Opheliidae sp. A _Armandia_ sp.	-	-	-	-	-	-
Capitellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Maldanidae sp. A	3.3	.0243	10.0	.128	-	-
Ampharetidae sp. A	-	-	-	-	-	-
B	-	-	6.7	.032	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
Terebellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	6.7	.158
C	-	-	-	-	-	-
D	-	-	-	-	-	-
Sabellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Serpulidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-

	101		103		113	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida						
Class Polychaeta						
Polynoidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Sigalionidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Phyllodocidae sp. A	-	-	-	-	-	-
Nereidae sp. A	-	-	-	-	-	-
B <u>Platynereis</u> sp.	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F <u>Eunereis</u> sp.(?)	-	-	-	-	-	-
G <u>Nereis</u> sp.	-	-	-	-	-	-
Nephytidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Eunicidae sp. A <u>Eunice</u> sp.	-	-	-	-	-	-
B	-	-	-	-	-	-
C <u>Marphysa</u> sp.	-	-	-	-	-	-
Onuphidae sp. A <u>Onuphis</u> sp.	-	-	-	-	-	-
B <u>Diopatra</u> sp.	-	-	-	-	-	-
C <u>Diopatra</u> sp.	-	-	-	-	-	-
D	-	-	-	-	-	-
Lumbrinereidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Spionidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D <u>Prionospio</u> sp.	-	-	-	-	-	-
E	-	-	-	-	-	-
F <u>Prionospio</u> sp.	-	-	-	-	-	-
Cirratulidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Orbiniidae sp. A	-	-	-	-	-	-
Opheliidae sp. A <u>Armandia</u> sp.	-	-	-	-	-	-
Capitellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
Maldanidae sp. A	-	-	-	-	3.3	2.83
Ampharetidae sp. A	-	-	3.3	.035	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
Terebellidae sp. A	3.3	2.63	3.3	1.64	3.3	1.767
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
Sabellidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
Serpulidae sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-

		117		119		122	
		Density	Weight	Density	Weight	Density	Weight
		no./m^2	gm/m^2	no./m^2	gm/m^2	no./m^2	gm/m^2
Phylum Annelida							
Class Polychaeta							
Polynoidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
Sigalionidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
Phyllodocidae	sp. A	–	–	–	–	–	–
Nereidae	sp. A	–	–	–	–	–	–
	B *Platynereis* sp.	–	–	–	–	–	–
	C	–	–	–	–	–	–
	D	–	–	–	–	–	–
	E	–	–	–	–	–	–
	F *Eunereis* sp.(?)	–	–	–	–	–	–
	G *Nereis* sp.	–	–	–	–	–	–
Nephytidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
Eunicidae	sp. A *Eunice* sp.	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C *Marphysa* sp.	–	–	–	–	–	–
Onuphidae	sp. A *Onuphis* sp.	–	–	–	–	–	–
	B *Diopatra* sp.	–	–	–	–	–	–
	C *Diopatra* sp.	–	–	–	–	–	–
	D	–	–	–	–	–	–
Lumbrinereidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
Spionidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
	D *Prionospio* sp.	–	–	–	–	–	–
	E	–	–	–	–	–	–
	F *Prionospio* sp.	–	–	–	–	–	–
Cirratulidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
Orbiniidae	sp. A	–	–	–	–	–	–
Opheliidae	sp. A *Armandia* sp.	–	–	–	–	–	–
Capitellidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
Maldanidae	sp. A	–	–	–	–	–	–
Ampharetidae	sp. A	–	–	–	–	–	–
Ampharetidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	3.3	.163	6.7	.347	–	–
	D	–	–	–	–	–	–
	E	–	–	–	–	–	–
Terebellidae	sp. A	–	–	6.7	5.067	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
	D	–	–	–	–	–	–
Sabellidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–
Serpulidae	sp. A	–	–	–	–	–	–
	B	–	–	–	–	–	–
	C	–	–	–	–	–	–

			126		129		130	
			Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida								
Class Polychaeta								
Polynoidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Sigalionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Phyllodocidae	sp. A		-	-	-	-	-	-
Nereidae	sp. A		-	-	-	-	-	-
	B	Platynereis sp.	-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
	F	Eunereis sp. (?)	-	-	-	-	-	-
	G	Nereis sp.	-	-	-	-	-	-
Nephytidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Eunicidae	sp. A	Eunice sp.	-	-	-	-	-	-
	B		-	-	-	-	-	-
	C	Marphysa sp.	-	-	-	-	-	-
Onuphidae	sp. A	Onuphis sp.	-	-	-	-	-	-
	B	Diopatra sp.	-	-	-	-	-	-
	C	Diopatra sp.	-	-	-	-	-	-
	D		-	-	-	-	-	-
Lumbrinereidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Spionidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D	Prionospio sp.	-	-	-	-	3.3	.025
	E		-	-	-	-	-	-
	F	Prionospio sp.	-	-	-	-	-	-
Cirratulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Orbiniidae	sp. A		-	-	-	-	-	-
Opheliidae	sp. A	Armandia sp.	-	-	-	-	-	-
Capitellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
Maldanidae	sp. A		3.3	.0243	-	-	-	-
Ampharetidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	3.3	.193	-	-
	D		-	-	-	-	-	-
	E		-	-	-	-	-	-
Terebellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
	D		-	-	-	-	-	-
Sabellidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-
Serpulidae	sp. A		-	-	-	-	-	-
	B		-	-	-	-	-	-
	C		-	-	-	-	-	-

		132 Density no./m²	132 Weight gm/m²	149 Density no./m²	149 Weight gm/m²	152 Density no./m²	152 Weight gm/m²
Phylum Annelida							
Class Polychaeta							
Polynoidae	sp. A	-	-	-	-	3.3	.118
	B	-	-	-	-	-	-
Sigalionidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	3.3	1.177
Phyllodocidae	sp. A	-	-	-	-	-	-
Nereidae	sp. A	-	-	-	-	-	-
	B *Platynereis* sp.	-	-	-	-	-	-
	C	-	-	-	-	-	-
	D	-	-	-	-	-	-
	E	-	-	-	-	-	-
	F *Eunereis* sp.(?)	-	-	-	-	3.3	2.73
	G *Nereis* sp.	-	-	-	-	-	-
Nephytidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	53.3	2.73
Eunicidae	sp. A *Eunice* sp.	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C *Marphysa* sp.	-	-	-	-	-	-
Onuphidae	sp. A *Onuphis* sp.	-	-	-	-	-	-
	B *Diopatra* sp.	-	-	-	-	-	-
	C *Diopatra* sp.	-	-	-	-	-	-
	D	-	-	-	-	-	-
Lumbrinereidae	sp. A	-	-	-	-	3.3	.013
	B	-	-	-	-	6.7	.047
	C	-	-	-	-	-	-
Spionidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	-	-
	D *Prionospio* sp.	-	-	6.7	.064	-	-
	E	-	-	-	-	-	-
	F *Prionospio* sp.	-	-	-	-	-	-
Cirratulidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
Orbiniidae	sp. A	-	-	-	-	-	-
Opheliidae	sp. A *Armandia* sp.	-	-	-	-	-	-
Capitellidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
Maldanidae	sp. A	-	-	-	-	-	-
Ampharetidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	-	-
	D	-	-	-	-	-	-
	E	-	-	-	-	-	-
Terebellidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	-	-
	D	-	-	-	-	-	-
Sabellidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	-	-
Serpulidae	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	-	-	-	-	-	-

			164		167	
			Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
Phylum Annelida						
Class Polychaeta						
Polynoidae	sp.	A	-	-	-	-
		B	-	-	-	-
Sigalionidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	-	-
Phyllodocidae	sp.	A	-	-	3.3	.010
Nereidae	sp.	A	-	-	-	-
		B Platynereis sp.	-	-	-	-
		C	-	-	-	-
		D	-	-	-	-
		E	-	-	-	-
		F Eunereis sp.(?)	-	-	-	-
		G Nereis sp.	-	-	6.7	.190
Nephytidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	26.7	1.323
Eunicidae	sp.	A Eunice sp.	-	-	-	-
		B	-	-	-	-
		C Marphysa sp.	-	-	-	-
Onuphidae	sp.	A Onuphis sp.	-	-	-	-
		B Diopatra sp.	-	-	-	-
		C Diopatra sp.	-	-	-	-
		D	-	-	-	-
Lumbrinereidae	sp.	A	-	-	3.3	.020
		B	-	-	63.3	3.467
		C	-	-	-	-
Spionidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	-	-
		D Prionospio sp.	6.7	.045	-	-
		E	-	-	-	-
		F Prionospio sp.	10.0	.049	-	-
Cirratulidae	sp.	A	-	-	-	-
		B	3.3	.029	-	-
Orbiniidae	sp.	A	3.3	.713	10.0	.923
Opheliidae	sp.	A Armandia sp.	-	-	3.3	.050
Capitellidae	sp.	A	6.7	.026	-	-
		B	-	-	-	-
Maldanidae	sp.	A	-	-	-	-
Ampharetidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	-	-
		D	-	-	-	-
		E	-	-	-	-
Terebellidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	3.3	.027
		D	-	-	-	-
Sabellidae	sp.	A	-	-	3.3	.032
		B	-	-	-	-
		C	-	-	-	-
Serpulidae	sp.	A	-	-	-	-
		B	-	-	-	-
		C	-	-	-	-

		Total no.	Mean Weight mg/m^2	Mean Density no./m^2	16 Density no./m^2	Weight gm/m^2
UNIDENTIFIED	sp. A	1	0.5	0.1	-	-
	B	1	67	0.1	-	-
	C	1	1	0.1	-	-
	D	2	2	0.2	1.4	.024
	E	17	36	1.9	-	-
	F	1	3	0.1	-	-
	G	3	7	0.3	-	-
	H	7	7	0.8	-	-
	I	14	844	1.3	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs		-	-	-	25.5	27.3
Coelenterates		-	-	-	2.8	13.1
Echinoderms		-	-	-	-	-
Crustaceans		-	-	-	69.9	1.8
Polychaetes		-	-	-	50.9	1.3
Total of all groups					149.1	43.5

	17 Density no./m²	17 Weight gm/m²	21 Density no./m²	21 Weight gm/m²	27 Density no./m²	27 Weight gm/m²
UNIDENTIFIED sp. A	2.5	.014	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	2.5	.162	-	-
F	-	-	-	-	-	-
G	2.5	.061	2.5	.0465	-	-
H	-	-	-	-	-	-
I	-	-	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	27.5	44.4	17.5	2.1	40.0	10.1
Coelenterates	-	-	-	-	3.3	17.5
Echinoderms	7.5	66.3	15.0	22.6	-	-
Crustaceans	47.5	4.5	5.0	0.1	-	-
Polychaetes	75.0	21.2	37.5	3.7	-	-
Total of all groups	157.5	136.3	90.0	55.6	46.6	35.1

	32 Density no./m²	32 Weight gm/m²	38 Density no./m²	38 Weight gm/m²	44 Density no./m²	44 Weight gm/m²
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	13.3	.387	-	-
F	-	-	-	-	-	-
G	-	-	3.3	.103	-	-
H	-	-	10.0	.107	-	-
I	-	-	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	33.3	34.6	46.7	182.2	196.6	193.6
Coelenterates	10.3	51.3	-	-	6.7	6.4
Echinoderms	-	-	-	-	3.3	0.1
Crustaceans	-	-	6.7	0.1	3.3	1.7
Polychaetes	-	-	40.0	0.7	-	-
Total of all groups	36.9	86.4	100.1	183.6	209.9	201.8

	59 Density no./m²	59 Weight gm/m²	60 Density no./m²	60 Weight gm/m²	64 Density no./m²	64 Weight gm/m²
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	13.3	.083	3.3	.019
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	3.3	.015	10.0	.089
I	6.7	.024	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	33.3	189.2	23.3	330.7	43.3	32.8
Coelenterates	-	-	-	-	-	-
Echinoderms	-	-	63.3	3.2	-	-
Crustaceans	23.3	0.3	40.0	6.4	26.7	0.9
Polychaetes	36.7	0.4	163.3	1.3	46.7	3.1
Total of all groups	93.3	189.8	289.9	341.3	120.0	48.5

	70 Density no./m²	70 Weight gm/m²	72 Density no./m²	72 Weight gm/m²	85 Density no./m²	85 Weight gm/m²
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	3.3	2.016	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	3.3	2.133	-	-	16.7	6.823
SUMMARY OF MAJOR GROUPS						
Molluscs	53.3	21.7	3.3	0.0	86.7	3.5
Coelenterates	3.3	0.0	-	-	13.3	24.9
Echinoderms	10.0	110.8	-	-	-	-
Crustaceans	-	-	-	-	23.3	0.1
Polychaetes	16.7	4.6	3.3	0.0	1.7	6.8
Total of all groups	89.9	138.0	9.9	0.1	150.0	36.5

	87 Density no./m^2	87 Weight gm/m^2	92 Density no./m^2	92 Weight gm/m^2	93 Density no./m^2	93 Weight gm/m^2
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	6.7	8.230	3.3	1.733	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	330.0	2.0	1013.3	1264.4	960.1	1107.5
Coelenterates	-	-	20.0	7.4	16.7	117.5
Echinoderms	-	-	3.3	4.5	10.0	12.3
Crustaceans	23.3	0.8	-	-	10.0	15.0
Polychaetes	20.0	8.3	23.3	1.9	6.7	0.2
Total of all groups	376.6	10.4	1076.5	1274.3	1010.2	1254.0

	101 Density no./m^2	101 Weight gm/m^2	103 Density no./m^2	103 Weight gm/m^2	113 Density no./m^2	113 Weight gm/m^2
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	3.3	3.233	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	100.0	161.1	160.0	601.1	243.3	200.4
Coelenterates	46.6	43.4	16.6	9.4	36.7	17.7
Echinoderms	-	-	-	-	13.3	52.4
Crustaceans	3.3	3.7	3.3	2.9	106.7	12.9
Polychaetes	6.6	5.9	6.6	1.7	6.7	4.6
Total of all groups	169.8	251.4	189.8	615.9	433.3	303.5

	117		119		122	
	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2	Density no./m^2	Weight gm/m^2
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F	3.3	.084	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	-	-	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	50.0	776.9	16.7	139.9	30.0	464.5
Coelenterates	43.3	55.0	20.0	10.8	46.7	84.9
Echinoderms	3.3	0.0	-	-	3.3	27.1
Crustaceans	3.3	1.1	3.3	4.8	-	-
Polychaetes	6.6	0.3	13.3	5.4	-	-
Total of all groups	116.5	838.5	63.2	172.0	83.3	577.6

	126 Density no./m²	126 Weight gm/m²	129 Density no./m²	129 Weight gm/m²	130 Density no./m²	130 Weight gm/m²
UNIDENTIFIED sp. A	-	-	-	-	-	-
B	-	-	-	-	-	-
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	3.3	.090	3.3	.031	-	-
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	-	-	-	-	-	-
SUMMARY OF MAJOR GROUPS						
Molluscs	770.0	2027.1	1366.7	1977.6	406.6	749.7
Coelenterates	23.4	40.1	6.7	2.6	3.3	5.3
Echinoderms	26.6	5.3	50.0	24.1	-	-
Crustaceans	56.7	3.3	470.0	44.4	-	-
Polychaetes	6.7	0.1	6.6	0.2	3.3	0.0
Total of all groups	893.4	2107.4	1903.3	2050.2	416.5	761.5

		132 Density no./m²	132 Weight gm/m²	149 Density no./m²	149 Weight gm/m²	157 Density no./m²	157 Weight gm/m²
UNIDENTIFIED	sp. A	-	-	-	-	-	-
	B	-	-	-	-	-	-
	C	3.3	.029	-	-	-	-
	D	-	-	-	-	-	-
	E	-	-	-	-	-	-
	F	-	-	-	-	-	-
	G	-	-	-	-	-	-
	H	-	-	-	-	-	-
	I	-	-	3.3	1.200	-	-
SUMMARY OF MAJOR GROUPS							
Molluscs		60.0	335.6	776.7	394.8	53.4	207.1
Coelenterates		3.3	10.9	10.0	45.5	-	-
Echinoderms		3.3	0.6	6.6	22.7	6.7	1.5
Crustaceans		-	-	3.3	1.1	63.3	16.0
Polychaetes		3.3	0.0	10.0	1.8	73.3	6.8
Total of all groups		69.9	347.1	813.3	466.4	206.6	233.7

	164		167	
	Density	Weight	Density	Weight
	no./m^2	gm/m^2	no./m^2	gm/m^2
UNIDENTIFIED sp. A	-	-	-	-
B	-	-	-	-
C	-	-	-	-
D	3.3	.051	-	-
E	-	-	16.7	.323
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
I	-	-	3.3	1.967
SUMMARY OF MAJOR GROUPS				
Molluscs	243.3	116.8	16.7	1.1
Coelenterates	10.0	17.4	6.7	0.8
Echinoderms	10.0	53.8	-	-
Crustaceans	-	-	143.3	8.3
Polychaetes	33.3	0.9	13.3	2.6
Total of all groups	319.9	222.2	180.0	12.8