

**Arklow Bank Offshore Windfarm Environmental Monitoring
Benthic Ecology Survey Report**

May 2007

A Report to HydroServ

December 2007



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1. INTRODUCTION

Aquatic Services Unit, University College Cork, was requested by HydroServ, on behalf of Arklow Energy Ltd., to undertake a benthic biological survey as part of a post construction monitoring programme for the Arklow Bank Offshore Windfarm. The following report outlines the work undertaken for this survey. Work for this report was undertaken between 22nd – 23rd May 2007.

The Arklow Bank Offshore Wind Farm lies 13km east of Arklow town and consists of seven 3.6 MW turbines. Construction was begun in 2002 with the building of these seven turbines. However, it is a possibility that large numbers of additional turbines may be built in the general area in the future. A baseline survey of the Arklow bank area and cable route was conducted in 2000-01 (pre-construction), consisting of 3 sampling periods: June 2000, September 2000 and April 2001. Various sampling techniques were used during the baseline survey; the first survey used otter trawls and anchor dredges, while the second two used Agassiz trawls and anchor dredges. Only qualitative data was produced from the anchor dredge samples and species were recorded as present/absent. Plankton was also sampled and temperature/salinity profiles generated.

The initial surveys undertaken in June/July 2004 were taken using Day Grabs, and these encountered severe problems with the hard ground. Subsequent surveys were undertaken using semi-quantitative anchor dredges to assess the benthic infauna and associated sediments. In addition, semi-quantitative beam trawls were used to assess benthic epifauna and benthic fish communities.

The locations of the sampling positions of the current survey are consistent with previous monitoring surveys. These sampling locations were specified by the client and are presented in Figure 1.1. and presented as a table in Table 1.1. These positions are the same as those sampled in previous surveys. As reported in the previous survey, the positions of the current stations do not coincide with the positions of the baseline survey.

	Beam Trawl Co-ordinates			
	Trawl In		Trawl Out	
	Easting	Northing	Easting	Northing
Trawl 1	698333	5856501	698505	5857280
Trawl 2	703994	5857308	704047	5857860
Trawl 3	706848	5866537	706724	5867201
Trawl 4	708627	5857787	708608	5858734
Trawl 5	703480	5848690	703440	5848105
Trawl 6	703159	5837570	703109	5836785

	Anchor Dredge Co-ordinates			
	Dredge In		Dredge Out	
	Easting	Northing	Easting	Northing
D1	695368	5854465	695272	5854431
D2	698158	5854355	697994	5854399
D3	700731	5855525	700675	5855402
D4	702766	5861783	702850	5861675
D5	703213	5864474	703255	5864542
D6	704047	5863550	704195	5863687
D7	704718	5864346	704656	5864194
D8	707350	5866552	707444	5866690
D9	708172	5856825	708194	5856631
D10	708324	5851135	708273	5851062
D11	707028	5846559	707033	5846865
D12	704508	5844520	704635	5844450
D13	703776	5838784	703777	5838645
D14	702100	5844792	702010	5844680
D15	703299	5851220	703215	5851157
D16	706203	5853385	706194	5853448
D17	706241	5858168	706269	5858298
D18	700843	5858370	700766	5858358
D19	697058	5847692	697185	5847675
D20	703695	5857132	703506	5856986

Table 1.1. Positions of the sampling positions for the ongoing monitoring programme at the Arklow Bank Offshore Windfarm. All locations are presented in UTM CM 9°W. Zone 29N.

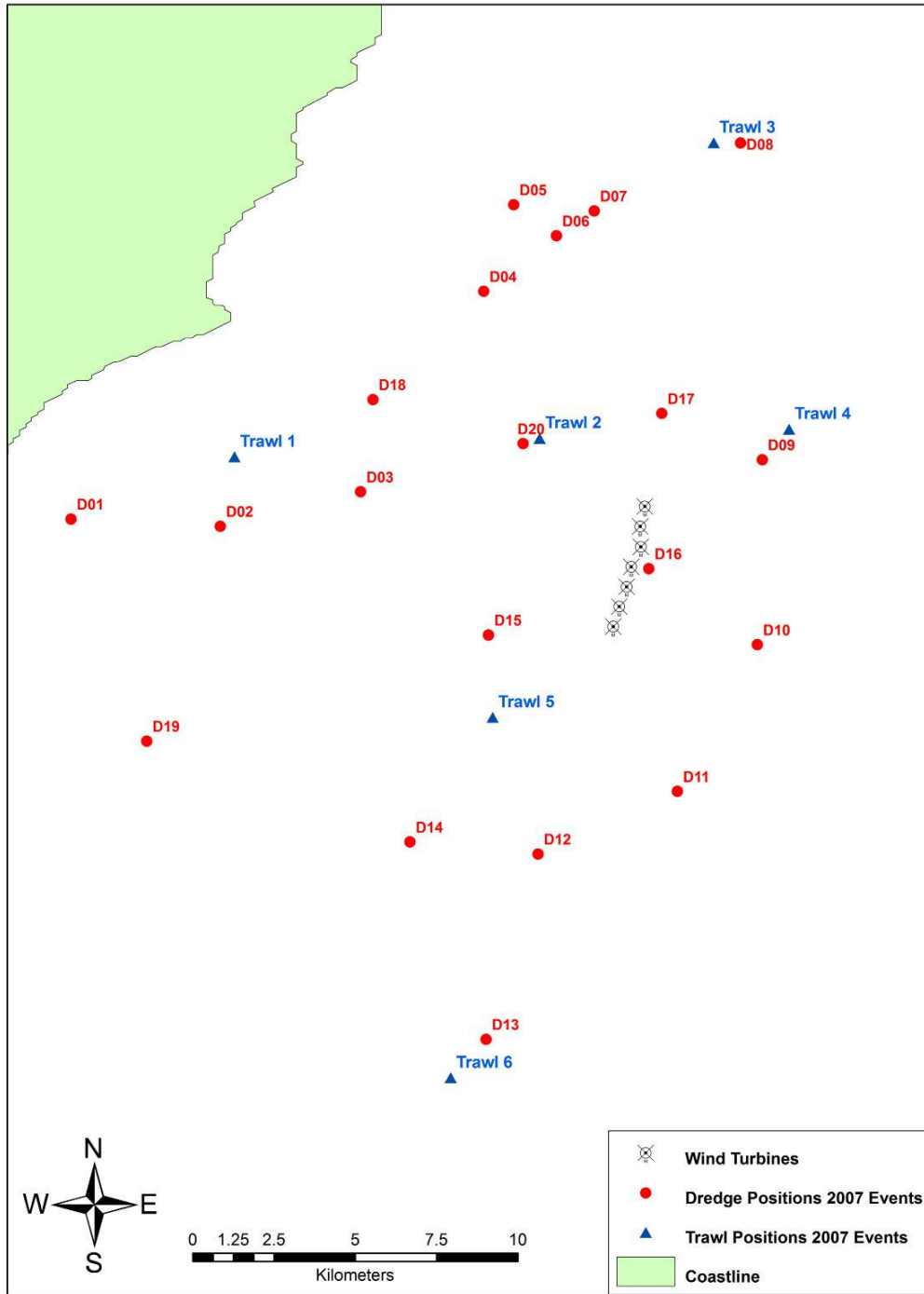


Figure 1.1 Anchor Dredge (● numbered D1 to D20) and Beam Trawl locations (▲ numbered Trawl 1 to Trawl 6) for the present monitoring survey (May 2007). These stations correspond to locations sampled in previous surveys.

2. METHODOLOGY

All sampling was undertaken from the MV Husky, based out of the Port of Arklow. The present survey was completed over the course of two days in May (22nd and 23rd).

2.1 Beam trawls

All trawls were taken using a 2m Beam Trawl, equipped with tickler chains and a 4mm mesh cod-end, as per previous surveys. All tows were 15 mins duration over the ground at a speed of 2/3 knots, with a warp of 2½ times water depth. This equated to a distance of approximately 300m. Once on board, the contents were placed into a sorting table and photographed prior to processing.

Fish species (both commercial and non-commercial) were separated and counted. Fish were measured using a graduated fish board before being returned. Colonial organisms (such as hydroids, bryozoans etc.) were marked present or absent.

Organisms were identified in the field, where possible. Organisms which were difficult to identify were retained in formalin for later processing. There was no sub-sampling undertaken in the present survey. Where samples were deemed to be too large, larger specimens were identified, counted and returned. All other specimens were retained for later identification and enumeration.

2.2 Anchor Dredge Sampling

At each sample station, a single anchor dredge sample was obtained with no replication of samples. The anchor dredge was deployed 20m in advance of the target and sufficient warp was paid out. The dredge was then dragged through the target to 20m beyond the target point. Where this proved unsuccessful, the process was repeated and the anchor dredge was dragged for a further distance.

After successful deployment and retrieval of the anchor dredge, the sample was transferred to a large container. The sample was labelled and photographed. Field notes were taken to include information such as sample number, date and time of sampling, a visual description of the sample, an estimate of the volume of the sample and any other relevant information in relation to the sampling effort.

A small sub-sample (~ 400g) was removed and transferred to a labelled container for Particle Size Analysis (PSA). This sample was placed in a cooler box whilst aboard the vessel and transferred immediately to a freezer on return to the laboratory until processing.

The remaining dredge sample was then sub-divided into three identical sampling units. Each unit was sieved through a 1.0mm mesh using a gentle puddling motion. Sediment which passed through the sieve was discarded, and the material retained on the sieve was transferred to a labelled container and fixed with 40% buffered formalin to a final concentration of 4% minimum. A waterproof label was then added to the sample bucket and the sample number was written in triplicate using a waterproof marker on the outside of each sample container.

As per previous surveys, only one of the three sampling units per site was processed and analysed. Samples were manually sorted by eye, using a binocular microscope where necessary. Sorted samples were then stored in 70% alcohol until identification. Samples were sent to Unicmarine Ltd. for identification (a company which have been implementing the NMBAQC scheme on behalf of its committee since its inception in 1994). Here the samples were identified to species level, where possible, counted and logged. The remaining sub-samples are held in storage.

2.3 Particle Size Analysis (PSA)

On arrival at the laboratory, Particle Size Analysis (PSA) samples were immediately stored in a freezer until processing. Samples were dried to a constant weight at a temperature of 100°C. Prior to dry-sieving, samples were pre-treated using the methods employed by Buchanan and Kain (1984). Dried samples were then sieved through a series of nested sieves (Endecott BS410/1986) using an electronic sieve shaker. A list of sieves used is displayed in Table 2.3.1.

Sediment grainsize distribution and statistics were then calculated for each of the sediment samples using the GRADISTAT package (Blott & Pye, 2001). This package was used to determine the mean and median particle sizes and determination of sorting co-efficient. Each sample was ascribed to a sediment type (Figure 2.3.1) based on Folk (1954) with size division based on the Wentworth Scale (Table 2.3.2). Sorting co-efficient terms are defined in Table 2.3.3.

Sieve Series Sizes (mm)							
4.0	2.0	1.0	0.5	0.25	0.125	0.63	<0.63

Table 2.3.1 Sieve series sizes (mm) used for particle size analysis (PSA).

Wentworth Scale (mm)	Phi units	Sediment types
>256 mm	<-8	Boulders
64 - 256 mm	-8 to -6	Cobble
4 - 64 mm	-6 to -2	Pebble
2 - 4 mm	-2 to -1	Granule
1 - 2 mm	-1 to 0	Very coarse sand
0.5 - 1 mm	0 - 1	Coarse sand
250 - 500 µm	1 - 2	Medium sand
125 - 250 µm	2 - 3	Fine sand
63 - 125 µm	3 - 4	Very fine sand
<63 µm	>4	Silt

Table 2.3.2 Classification used for defining sediment type (from Buchanan & Kain, 1984).

Standard Deviation of mean Phi	Classification
<0.35	Very well sorted
0.35 - 0.5	Well sorted
0.5 - 0.71	Moderately well sorted
0.71 - 1	Moderately sorted
1 - 2	Poorly sorted
2 - 4	Very poorly sorted
>4	Extremely poorly sorted

Table 2.3.3 Classification used defining degree of sediment sorting (from Buchanan & Kain, 1984).

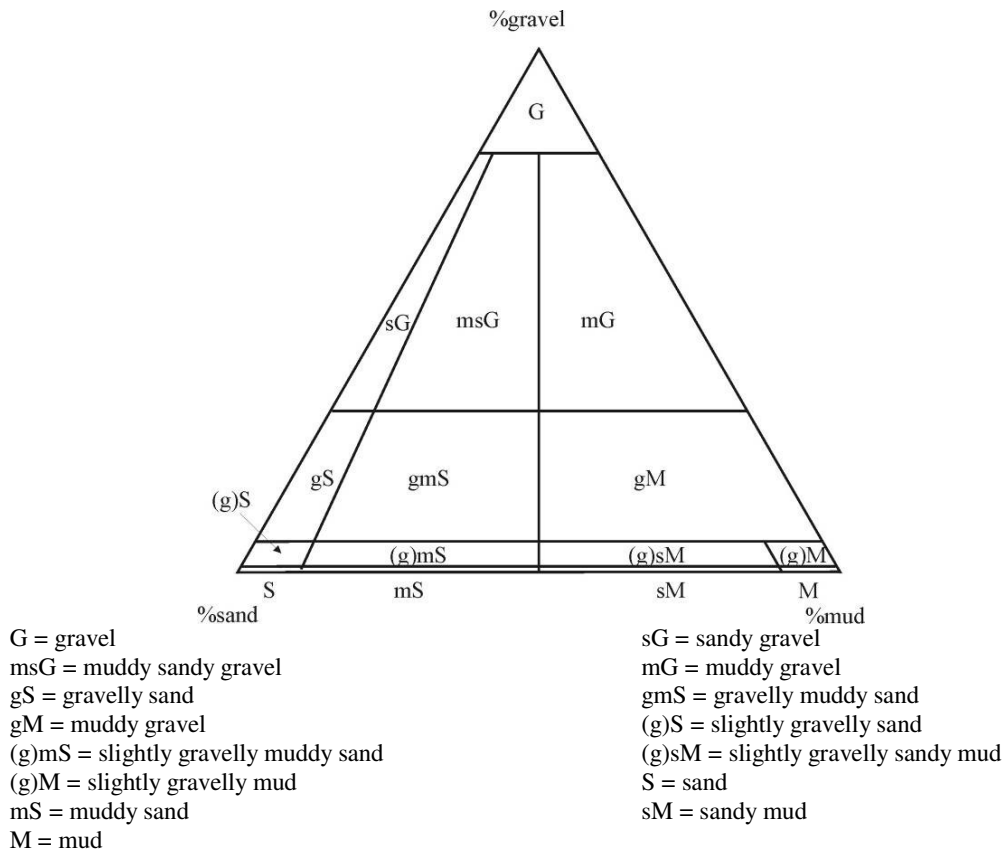


Figure 2.3.1 Sediment classification after Folk (1954) as also used by the BGS. "Gravel" is greater than 2mm and "mud" is less than 63µm.

2.4 Data Analysis

On completion of the sample processing and identification the data was analysed using a variety of univariate and multivariate analyses to determine community structure and assess change compared to previous surveys.

As stated in previous reports (Hydroserv, 2005; Hydroserv, 2006; Hydroserv 2007), different types of sampling gear have been used in previous surveys, as well as different levels of species identification. Therefore the present report will compare the current dataset against the previous three surveys (Hydroserv 2007 for the June 2006 survey, Hydroserv 2006 for the June 2005 survey and Hydroserv 2005 for the October 2004 survey). Statistical analysis between the previous surveys and the baseline survey has been undertaken in the previous surveys and will not be addressed in the current report.

Multivariate analysis was performed on the raw datasets using PRIMER v 5 (Clarke & Warwick, 1994). The data was subjected to a variety of multivariate analyses, including non-metric Multi Dimensional Scaling (MDS).

2.4.1 Beam Trawls

In the present survey, as in previous surveys, a total of 6 beam trawls were taken across the survey area. Although this number of trawls is quite small and results from multivariate analysis can only be described as descriptive, it was considered a useful exercise to compare against the results of the previous surveys.

Square-root transformations were performed on the abundance data with colonial organisms removed. In addition the beam trawl data was subjected to analysis on the presence/absence dataset including all identified taxa.

2.4.2 Anchor dredge samples

As in previous reports, a variety of univariate, multivariate and graphical techniques were used to provide the information concerning species diversity and community structure.

Multivariate analysis was based on square-root transformed abundances of species present, which allows for a sensible balance between the rare and common species. Multi-Dimension Scaling (MDS) ordination was based on the Bray-Curtis similarity coefficient. Stress values are provided for each MDS plot. It is important to note that these stress values represent the relationship between the various samples. In brief, a stress value of <0.05 indicates that there is an excellent representation of the relationship between the various samples, <0.1 indicates good ordination and <0.2 indicates a potentially useful 2-dimensional picture (Clarke and Warwick, 1994). In order to investigate the effect of the environmental data on the stations, sample clustering determined from the above analysis was repeated with mean sediment particle size superimposed.

The initial monitoring report (Hydroserv, 2004) compared pooled replicates between the sites taken with a 0.1m² Day Grab. This information was compared to information obtained in the baseline survey of 2000. Analysis indicates that comparisons between these two surveys were incompatable due to inherent differences in the sampling equipment used. A resurvey was undertaken in October 2004 using the current sampling methodology (anchor dredge and beam-trawl sampling methods). This report indicated that the assemblages reported in October 2004 were broadly similar to those identified in the baseline survey (Ecoserve, 2001), although direct comparisons were difficult due to the different sampling methods used (Hydroserv 2005).

3. RESULTS

3.1 Beam Trawls

Raw data from the beam trawls are presented in Appendix 6.3, in addition to information on fish species and lengths. A total of 177 taxa were identified in the present survey. Of these 177 taxa, only 7 were fish species. The total number of taxa is considerably higher than the June 2006 (98 taxa), June 2005 (47 taxa) and the October 2005 (51 taxa) surveys.

The number of fish species and abundances found at each trawl location in October 2004, June 2005, June 2006 and the present survey are presented in Figures 3.1.1 and 3.1.2. The total number of fish taxa identified in the present survey (7 species) is down on previous surveys (14 – June 2006, 13 – June 2005 and 9 – October 2004). In addition, the number of fish caught in the present survey (18 individuals) is much lower than previous surveys (55 – June 2006, 74 – June 2005 and 80 – October 2004). In the present survey, the northernmost station, Trawl 3, had the highest number of both species and abundances (5 & 11 respectively). Overall, fish abundances are quite low, ranging from 0 individual in Trawl 6 to 11 individuals in Trawl 3.

Important commercial fish were limited to 2 Plaice (*Pleuronectes platessa*) and a single turbot (*Psetta maxima*). No elasmobranchs were caught in the present survey compared to 3 (June 2006), 4 (June 2005) and 3 (October 2004) in previous surveys.

As mentioned in previous reports, the use of small (2m) beam trawls are a far from ideal survey method for fish sampling. However, it has been shown to be quite effective for most bottom dwelling fish species (ICES 2003). Results from the present survey concur with findings in the previous reports in that benthic fish populations are quite low in surveyed area.

The beam trawl surveys yielded a total of 177 faunal species, which was significantly higher than that recorded in June 2006 (98 taxa), June 2005 (36 taxa) and October 2004 (42 taxa). Total numbers of countable organisms was also increased from last year (from 1783 in June 2006 to 4367 from the present survey). In addition, nineteen [19] species were found in numbers ≥ 20 over the whole survey area. A complete list of the most countable faunal species identified in the present survey is presented in Table 3.1.1.

The highest numbers of taxa encountered at the trawl sites were found in Trawls 3 and 5 (82 and 76 taxa respectively). These stations also had the highest number of countable taxa (63 and 55 respectively). However, Trawls 3 and 4 had highest abundances recorded in the present survey (3276 and 512 respectively). This was caused by the presence of a *Sabellaria* reef at Trawls 3 & 4, with 1752 (Trawl 3) & 293 (Trawl 4) individual worms being recorded, as well as 939 (Trawl 3) & 70 (Trawl 4) reef dwelling *Pisidia longicornis*.

The *Sabellaria* reef encountered in Trawl 3 is marked as absent in all previous surveys, but reflects irregular spatial distribution of these biogenic reefs within the area. This is also reflected in the presence of a *Sabellaria* reef marked present in last years survey which was also absent in previous surveys, although mention was made of the presence of a reef in the baseline survey.

	May 2007	June 2006	June 2005	October 2004
<i>Sabellaria alveolata</i>	2083	668	0	0
<i>Pisidia longicornis</i>	1033	238	4	1
<i>Antedon bifida</i>	186	20	0	0
<i>Asterias rubens</i>	131	39	8	100
<i>Asciidiella scabra</i>	56	0	49	29
<i>Pagurus bernhardus</i>	54	69	95	583
<i>Psammechinus miliaris</i>	53	130	162	464
<i>Crangon almanni</i>	52	53	38	130
<i>Macropodia rostrata</i>	39	36	28	128
<i>Liocarcinus</i> (juv)	39	19	0	0

Table 3.1.1 Numbers of the 10 most common countable faunal species found in the May 2007 compared to abundances found in June 2006, June 2005 and October 2004 beam trawl surveys

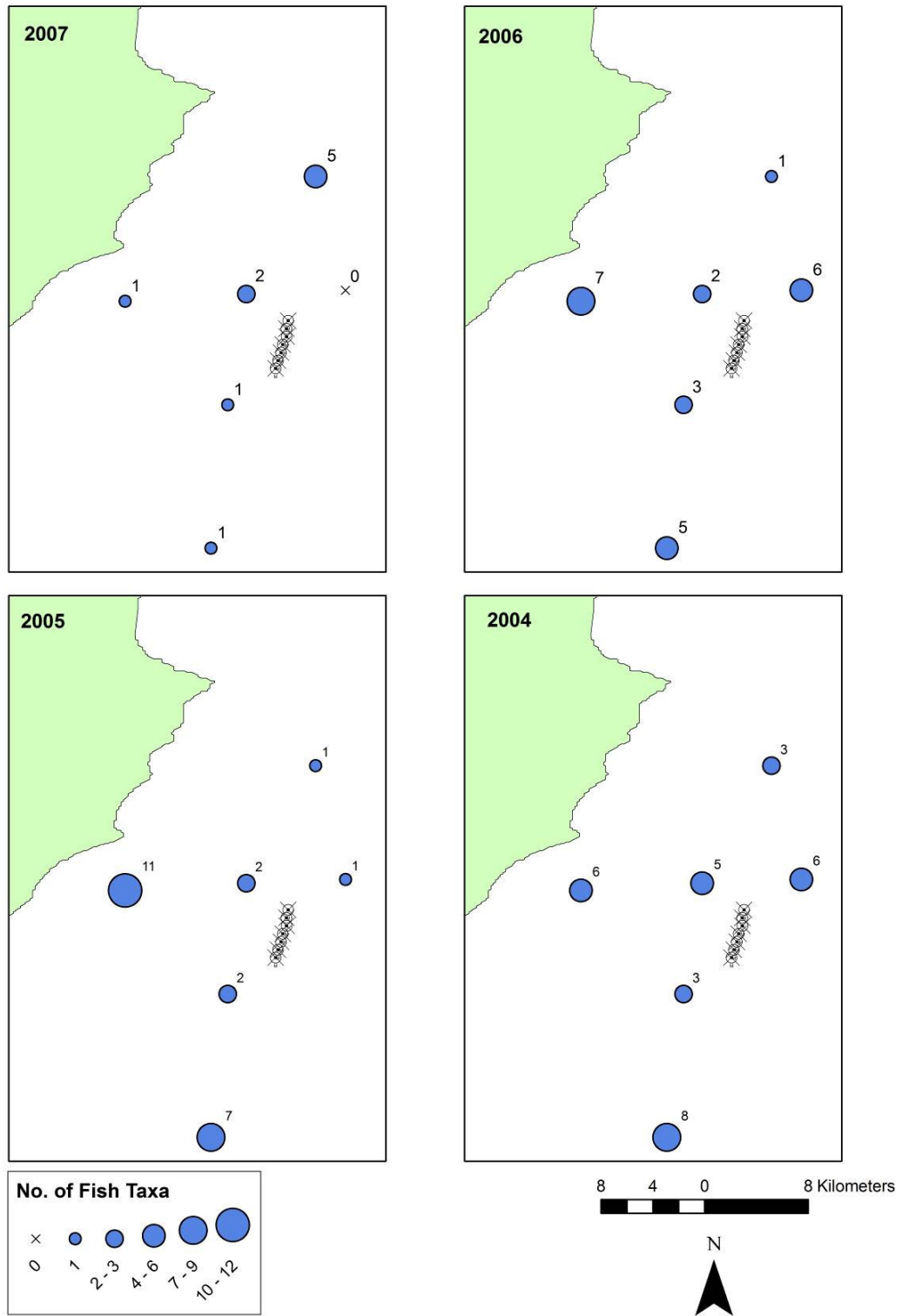


Figure 3.1.1 Total number of fish taxa per trawl site (October 2004, June 2005, June 2006 & May 2007)

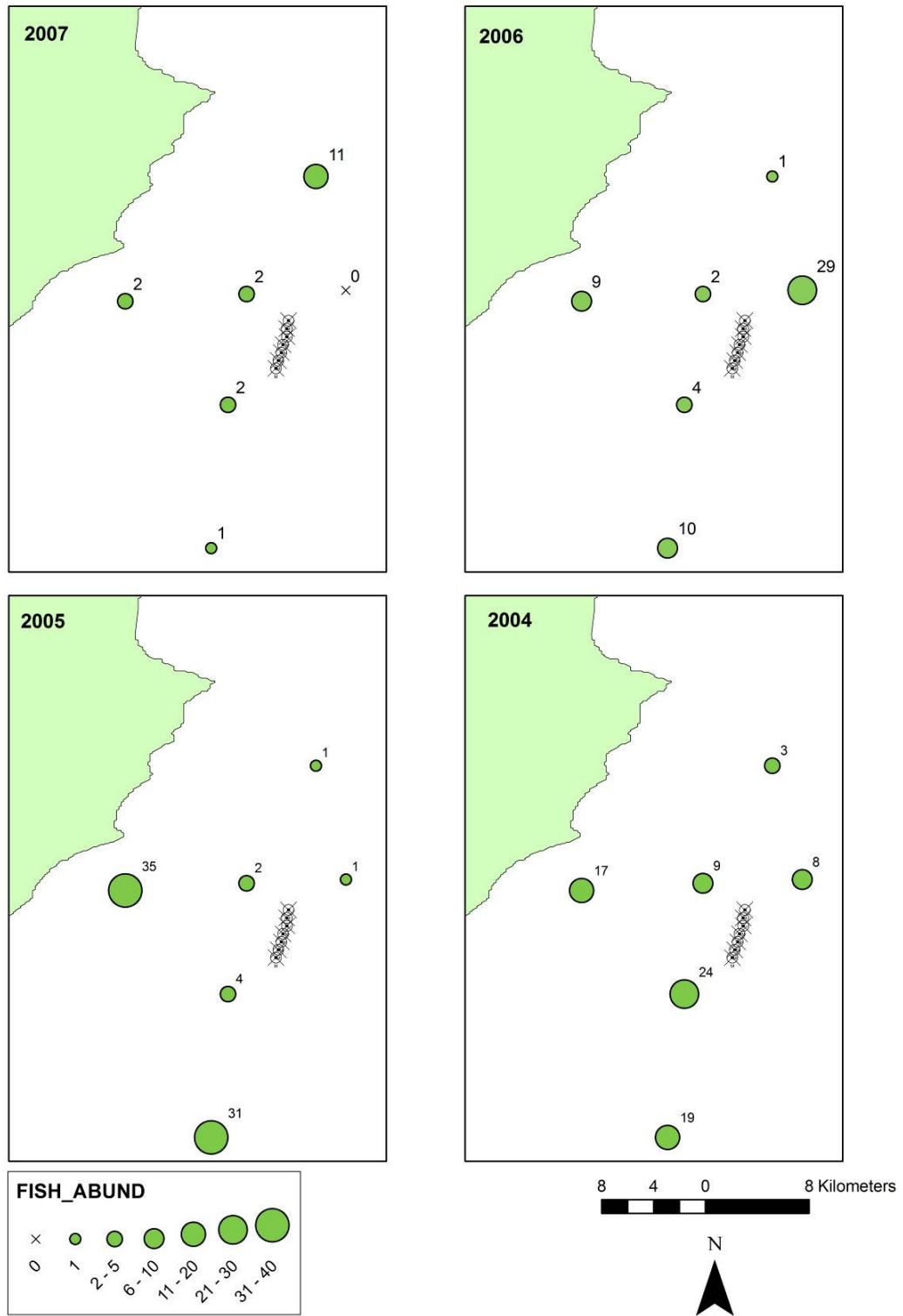


Figure 3.1.2 Total number of fish per trawl site (October 2004, June 2005, June 2006 & May 2007)

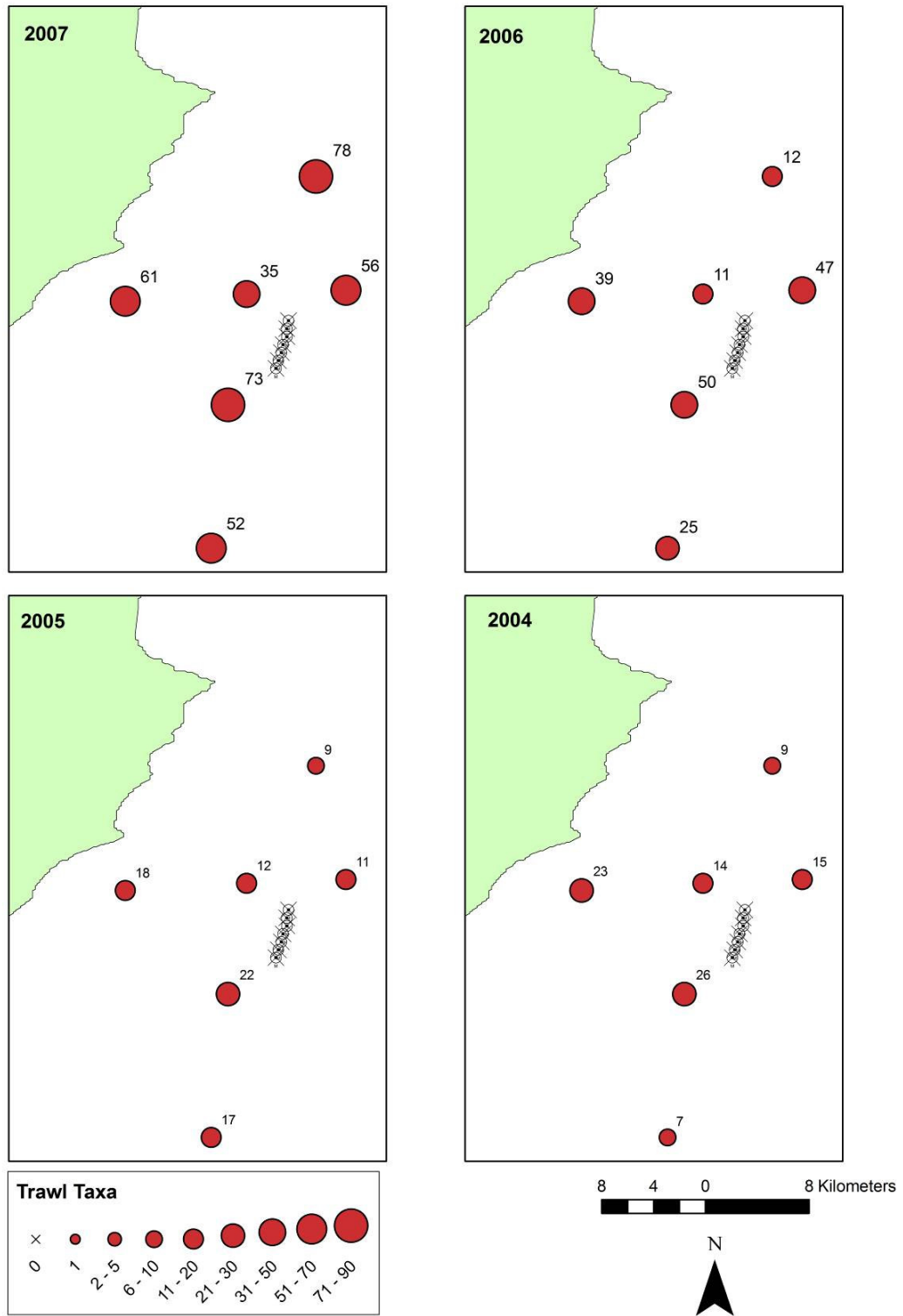


Figure 3.1.3 Total number of invertebrate taxa per trawl site (October 2004, June 2005, June 2006 & May 2007)

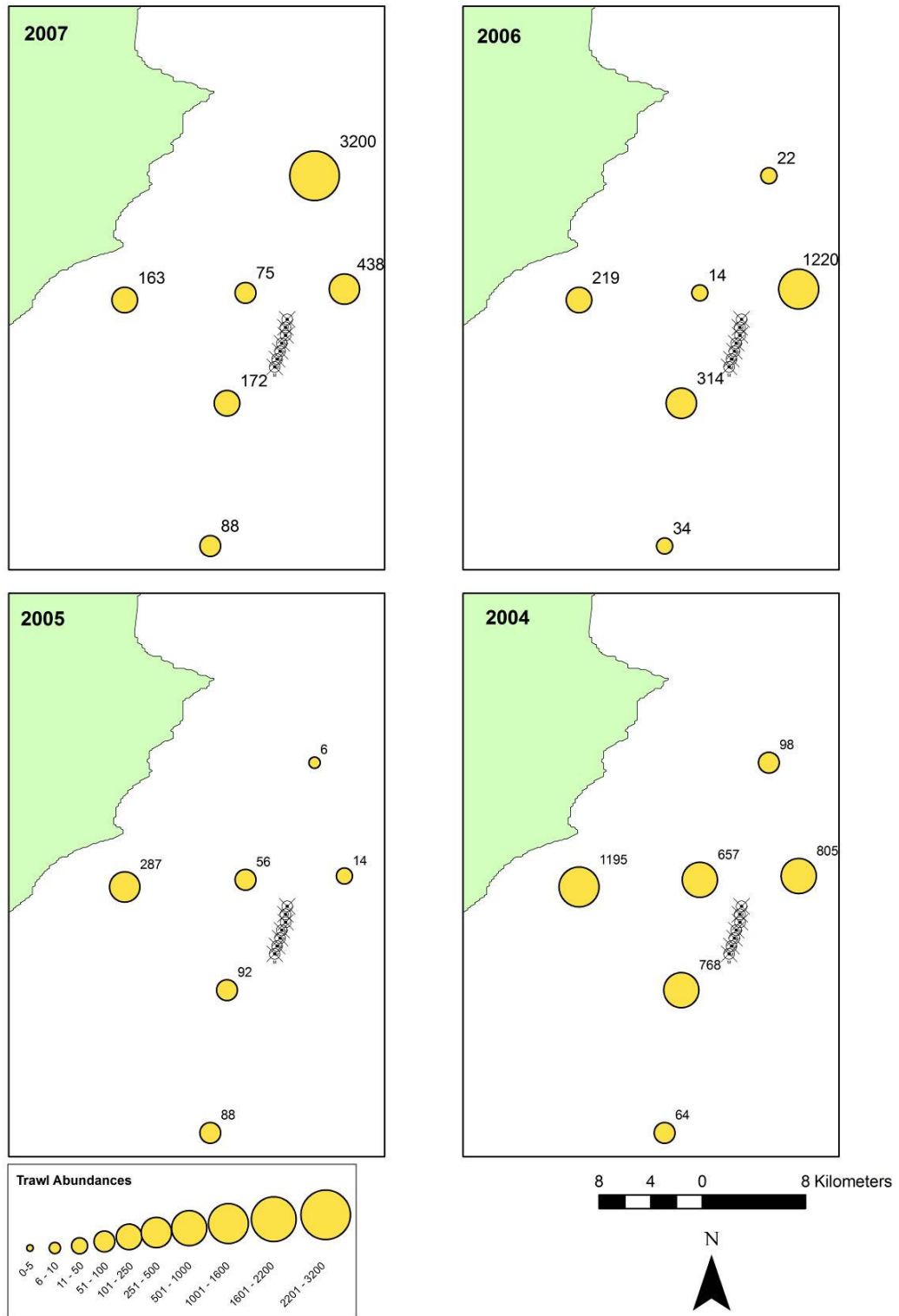


Figure 3.1.4 Total number of countable invertebrates per trawl site (October 2004, June 2005, June 2006 & May 2007)

A multivariate analysis of the community structure reveals the presence of no distinct community structure, based on both the presence/absence dataset (Figure 3.2.5 a) and the dataset with colonial organisms removed (Figure 3.2.5 b).

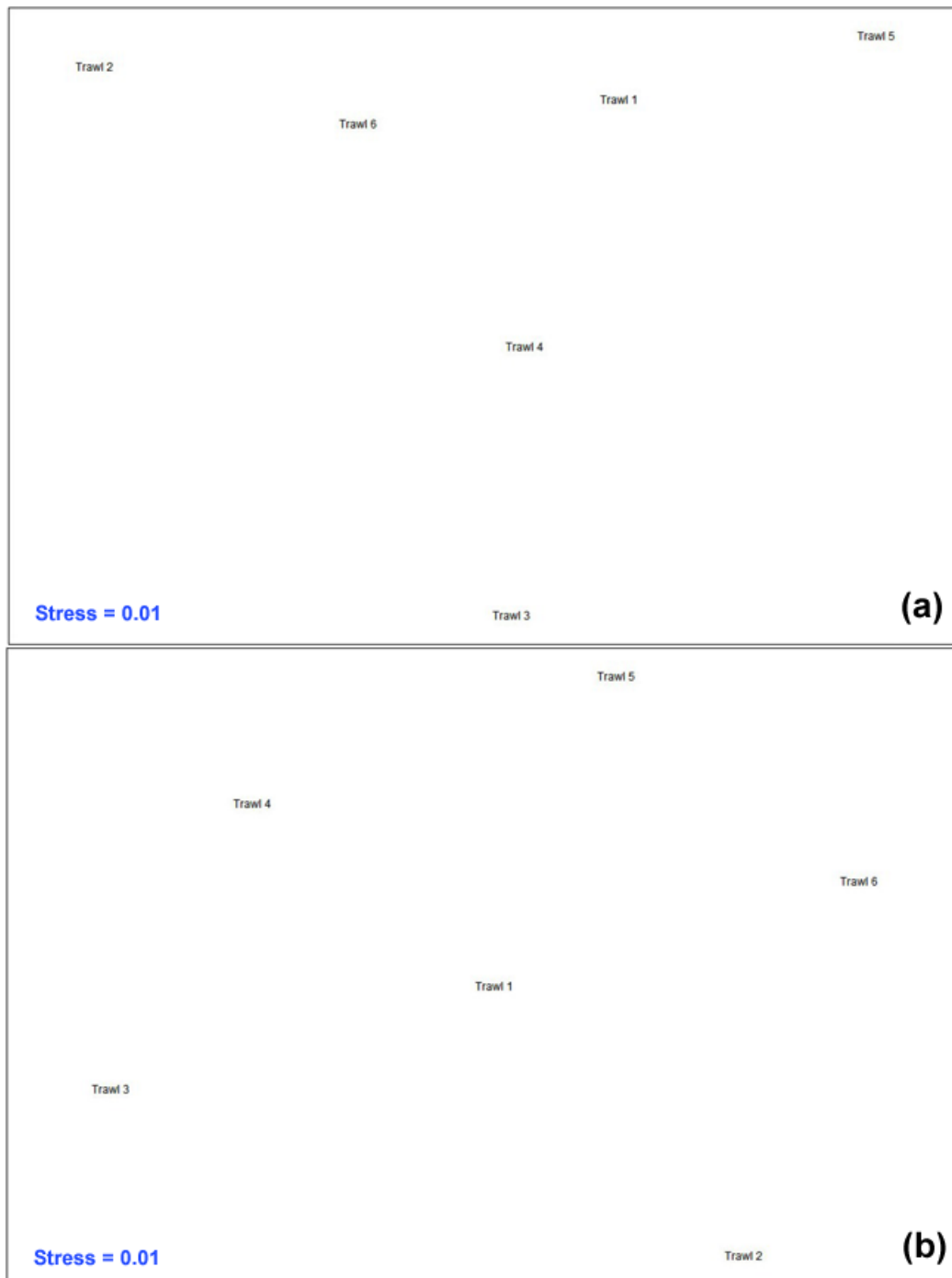


Figure 3.1.5 (a) Multivariate analysis (nMDS plot) on the 2006 trawl data, colonial data included (Stress = 0.01).
(b) Multivariate analysis of the countable fauna, colonial data removed (Stress = 0.01).

3.2 Anchor Dredge Samples

3.2.1 Particle Size Analysis

Data is presented in full for the particle size analysis in Appendix 6.6. Table 3.2.1 also presents a summary of the results and a visual assessment based on the on-board field notes. As can be seen from the results, there is an extensive range of sediments present within the survey area (Figure 3.2.1). These sediments range from well sorted fine gravels (at two locations) to moderately sorted fine sands (at one location), with a range of types in between. The reported distribution and generalised pattern is varies slightly with those reported for previous surveys. A distribution map of the sediment data is presented in Figure 3.2.2. As can be seen, all sites which are present on top of the Arklow are dominated by sands, although some minor changes have occurred, with a reduction in the sand content at station 17 (from Slightly Gravelly Sand to Gravelly Sand). The sites immediately north (station 8) and south (station 12) of the bank are also dominated by sands. As previously reported, the deeper stations both inshore and offshore of the bank, consist of coarser materials. However, there is some variation between the results obtained in the present survey against those presented for previous surveys. Station 6 is recorded as slightly gravelly sand in the present survey, which shows a slight increase in the gravel component to match levels found in 2005. In addition, Stations 7, 10 & 18 are now recorded as gravel indicating a reduction in the sand component at these sites. The other significant difference occurs at Station 11 which contained a significant muddy component in the current survey. It is very possible that this variation in PSA results may reflect some local heterogeneity in the sediment present within the survey area.

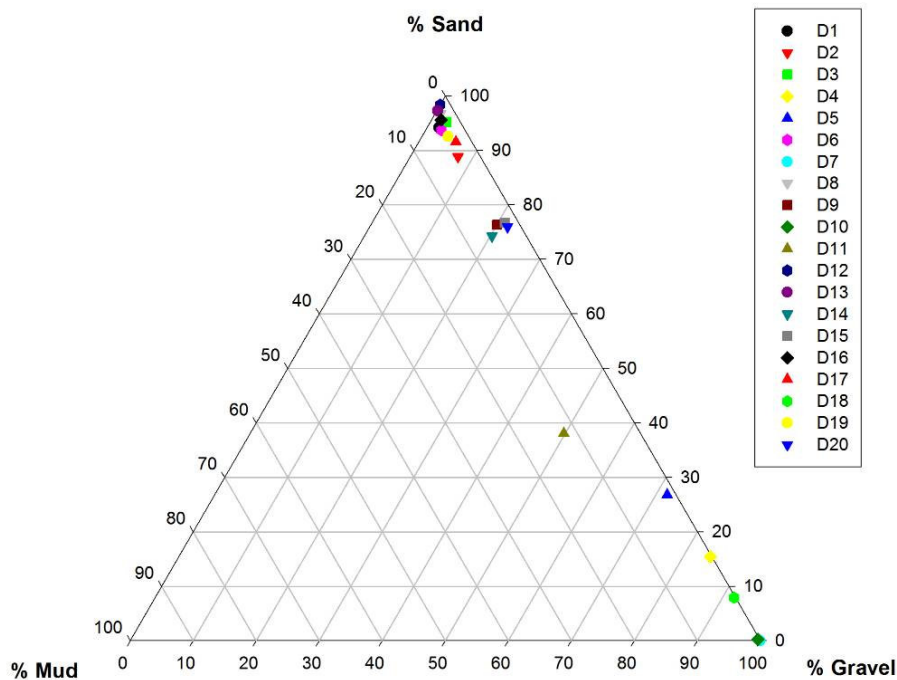


Figure 3.2.1 Ternary plot of PSA results from May 2007 Survey.

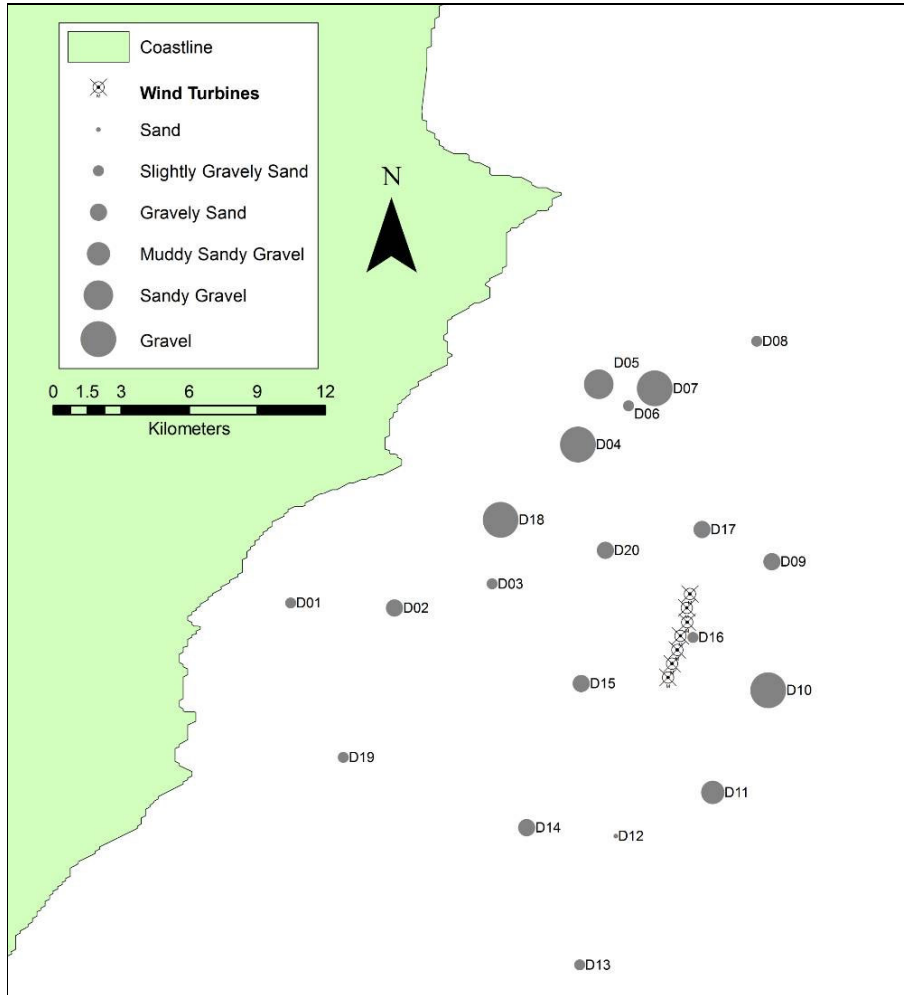


Figure 3.2.2 Distribution of sediment type as determine from the anchor dredge samples in May 2007. Site numbers are shown.

Site Code	Classification after Buchanan	Textural Group (May 2007)	Textural Group (June 2006)	Visual assessment
1	Moderately Sorted Fine Sand	Slightly Gravelly Sand [(g)S]	Gravelly Sand [gS]	Gravelly Sand containing some shell
2	Poorly Sorted Medium Sand	Gravelly Sand [gS]	Gravelly Sand [gS]	Gravelly Sand with anoxia evident in sediment
3	Moderately Well Sorted Fine Sand	Slightly Gravelly Sand [(g)S]	Slightly Gravelly Sand [(g)S]	Clean Sand
4	Moderately Sorted Very Fine Gravel	Gravel [G]	Gravel [G]	Gravel and cobbles with associated epifauna
5	Poorly Sorted Very Coarse Sand	Sandy Gravel [gS]	Sandy Gravel [sG]	Sandy gravel with associated epifauna
6	Moderately Sorted Medium Sand	Slightly Gravelly Sand [(g)S]	Sand [S] ¹	Sabellaria with cobble
7	Gravel	Gravel [G]	Sandy Gravel [sG]	Gravel
8	Well Sorted Medium Sand	Slightly Gravelly Sand [(g)S]	Gravelly Sand [gS]	Sand
9	Poorly Sorted Coarse Sand	Gravelly Sand [gS]	Gravelly Sand [gS]	Sand with extensive shell gravel
10	Very Well Sorted Fine Gravel	Gravel [G]	Sandy Gravel [sG]	Gravel with large cobbles present.
11	Very Poorly Sorted Very Coarse Sand	Muddy Sandy Gravel [msG]	Sandy Gravel [sG]	Sandy gravel
12	Well Sorted Medium Sand	Sand [S]	Slightly Gravelly Sand [(g)S]	Sand
13	Well Sorted Medium Sand	Slightly Gravelly Sand [(g)S]	Slightly Gravelly Sand [(g)S]	Sand
14	Very Poorly Sorted Medium Sand	Gravelly Sand [gS]	Sandy Gravel [sG]	Very Gravelly Sand
15	Poorly Sorted Coarse Sand	Gravelly Sand [gS]	Gravelly Sand [gS]	Shell gravel in sand
16	Well Sorted Medium Sand	Slightly Gravelly Sand [(g)S]	Slightly Gravelly Sand [(g)S]	Sand
17	Moderately Sorted Medium Sand	Gravelly Sand [gS]	Slightly Gravelly Sand [(g)S]	Gravelly Sand
18	Moderately Well Sorted Fine Gravel	Gravel [G]	Sandy Gravel [sG]	Gravel with associated epifauna
19	Moderately Well Sorted Medium Sand	Slightly Gravelly Sand [(g)S]	Slightly Gravelly Sand [(g)S]	Slightly Gravelly Sand
20	Poorly Sorted Coarse Sand	Gravelly Sand [gS]	Gravelly Sand [gS]	Gravelly Sand with shell gravel.

Table 3.2.1 Classification of sediment types at May 2007 grab stations according to methods after Buchanan & Kain and Folk & Ward, as used by BGS (see methods), together with visual assessment of sediments from notes taken at the time. Folk and Ward classification for the June 2006 survey is also given for comparison.

¹ Large shell were removed from the PSA prior to dry sieving

3.2.2 Biota

3.2.2.1 Abundance and diversity

A full taxonomic list of all species identified for the May 2007 survey is presented in Appendix 6.2. The full data matrix, including abundance data is presented in Appendix 6.5. In total, there were 17,800 individuals from 184 countable taxa recorded in the present survey. There were an additional 70 colonial taxa recorded, resulting in 254 taxa in total recorded in May 2007. This is considerably lower than the numbers of countable taxa and their total abundances from all previous surveys (24,779 individuals from 262 countable taxa in June 2006, 49,811 individuals from 346 countable taxa in June 2005 and 31,919 individuals from 300 taxa in October 2004). This is a large drop from previous surveys, although it is difficult to say if this represents a true trend, or whether it is a result of local heterogeneity or some other factor.

The large decrease in numbers are as a result of several species which were present in large numbers in previous surveys being absent or much reduced in the present dataset. *Mytilus edulis* which was present in large numbers at Station 6 in 2005 (4,908) and 2006 (297) is virtually absent in the present survey (only a single specimen was returned). In addition, the most abundant species in 2004, 2005 and 2006 are similar to the most abundant species present during the 2007 survey; however, abundances are reduced across all sites indicating a suppression of fauna across the area.

The total number of taxa and individuals recorded at each station is presented in Figure 3.2.3 (number of taxa) and Figure 3.2.4 (number of individuals). The general trend observed in previous surveys is reflected in the current survey. The stations immediately to the north and south of the Arklow Bank are again particularly poor in both species and abundances. In addition, the stations which are offshore of the Arklow Bank and a band of stations which are present along the north-west edge of the survey area are much richer in taxa and abundances (Table 3.2.2).

Overall, values for Margalef's species richness have reduced in 12 of the 20 stations. These differences can be related to a large scale reduction in both species numbers and abundances across the board. Only three locations showed an increase in Margalef's species richness. The largest difference occurred at Station 6 (from 1.88 to 7.93) which was one of only two sites during this survey which showed an increase in both species number and abundances (the other site was station 19 which showed marginal increases in both taxa and abundances).

An examination of the most abundant taxa (Table 3.2.3) also reveals significant differences in abundances against previous surveys. Only 11 species were present with greater than 70 individuals across the survey area compared to 17 in the last survey. This is much smaller than the figures reported in 2005 (35 taxa) and 2004 (19). However, the species identified as the most abundant are similar to the most abundant species in previous surveys.

It is interesting to note that the increased abundances identified in 2004 and 2005 were as a result of very high abundances of the most abundant individuals (*Pomatoceros triqueter/lamarcki*, *Sabellaria* spp. and *Mytilus edulis*). These species are recorded for the present survey, however at much reduced abundances. The reason for this variation is not clear; however it may partly be explained by seasonal/annual variation and also sediment heterogeneity, as evident in comparisons with the particle size data from previous surveys.

3.2.2.2 Multivariate analysis

All multivariate analysis was undertaken using the statistical package PRIMER v 5.

Non-metric multi-dimensional scaling (MDS) analysis was performed on the 2007 dataset. Figure 3.2.7 shows the relationships between the different stations. As can be seen from Fig. 3.2.7 a & b, sites 1, 2, 4, 5, 6, 7, 9, 10, 11, 14 and 18 all have very similar communities (which is similar to results obtained in 2006). All these sites have a relatively large gravel component, and if the sediment type is superimposed over the MDS plot (Figure 3.2.7.c) then it is clear that this large gravel component has a very clear structuring role in this community type. These closely clustered sites are characterised by the presence of large numbers of epifaunal invertebrates such as the tubeworm *Pomatoceros lamarcki*, the tunicate *Dendrodoa grossularia*, the bryozoans *Escharella ventricosa* & *Turbicellipora avicularis* and the mollusc *Nucula nucleus*. All these species are typical of hard benthos, containing large volumes of coarse gravel, cobble and bedrock.

The sandier sites did not cluster well together. Stations 8, 12 & 17 returned 0 fauna in the present survey and stations 3 (*Spio armata*) and 16 (*Anaitides groenlandica*) returned only a single countable individual. The reduced diversity evident at these sites is reflected in the poor community structure seen here.

No analysis was undertaken using the present dataset against the baseline data. As reported previously, there was no similarity between the data from the baseline survey in 2000 and that undertaken in October 2004 and June 2005. As such it was deemed unnecessary to continue this comparison using the present dataset.

However, broad similarities do exist between the data obtained in the baseline survey and those obtained in the present survey. As previously reported, both surveys found very sparse communities within the mobile sands, and species rich communities within the gravely sediments.

	Number of Taxa (S)	Number of Individuals (N)	Simpson's Dominance Index (d)	Shannon- Wiener Diversity Index (H')	Margalef's Species Richness (Dmg)
D1	28	51	0.0757	2.99	6.87
D2	32	71	0.0478	3.26	7.27
D3	1	1	1	0	-
D4	30	6160	0.941	0.195	3.32
D5	62	9080	0.806	0.558	6.69
D6	54	796	0.311	1.96	7.93
D7	38	573	0.414	1.66	5.83
D8	0	0	-	-	-
D9	15	25	0.0944	2.54	4.35
D10	31	171	0.204	2.19	5.83
D11	27	74	0.0964	2.78	6.04
D12	0	0	-	-	-
D13	5	5	0.2	1.61	2.49
D14	53	170	0.066	3.35	10.1
D15	3	5	0.44	0.95	1.24
D16	1	1	1	-	-
D17	0	0	-	-	-
D18	50	605	0.271	1.97	7.65
D19	11	45	0.238	1.82	2.63
D20	3	4	0.375	1.04	1.44

Table 3.2.2 Univariate descriptors of abundance and richness in the 20 dredge samples from May 2007.

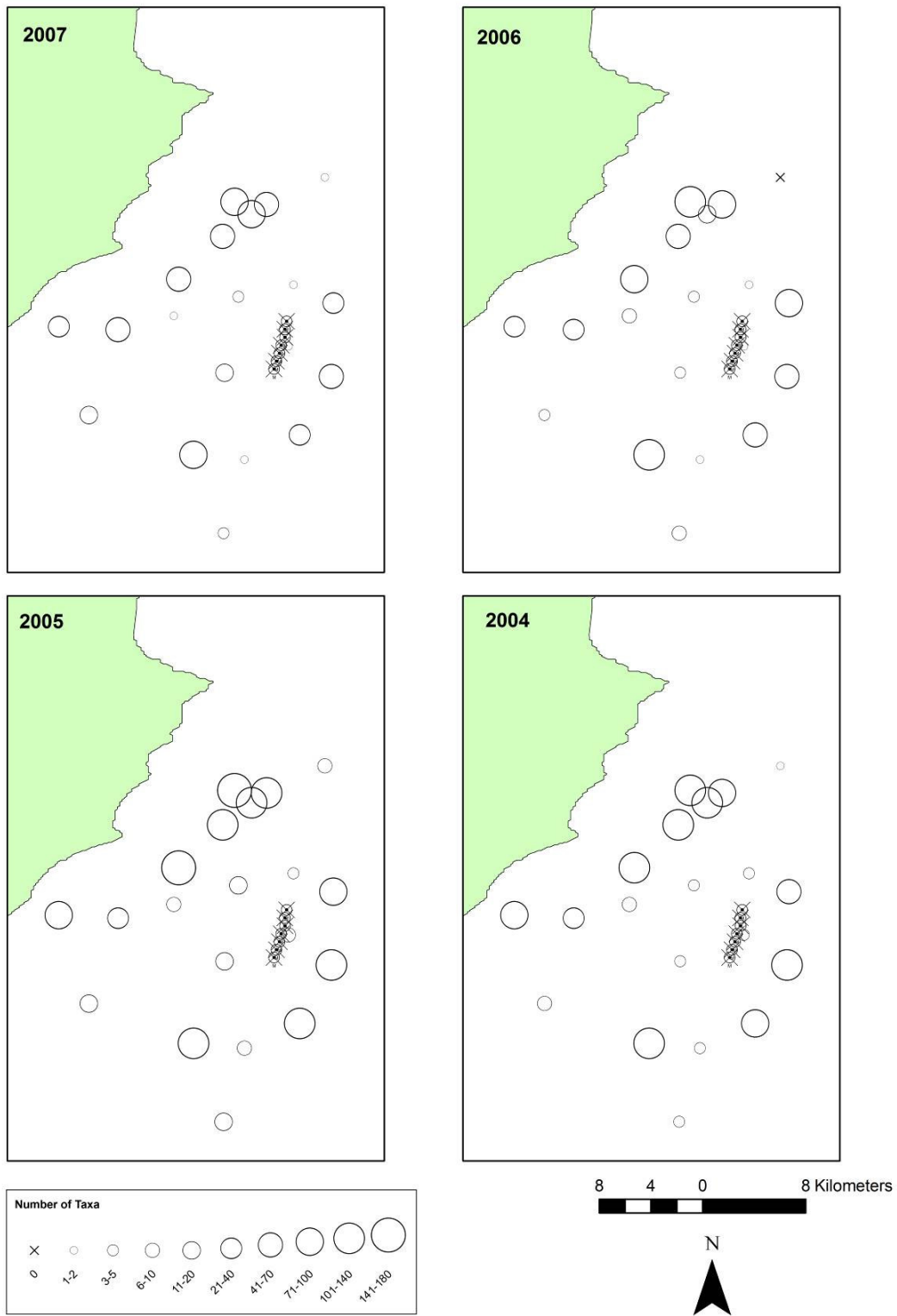


Figure 3.2.3 Total number of taxa per anchor dredge site (October 2004, June 2005, June 2006 & May 2007)

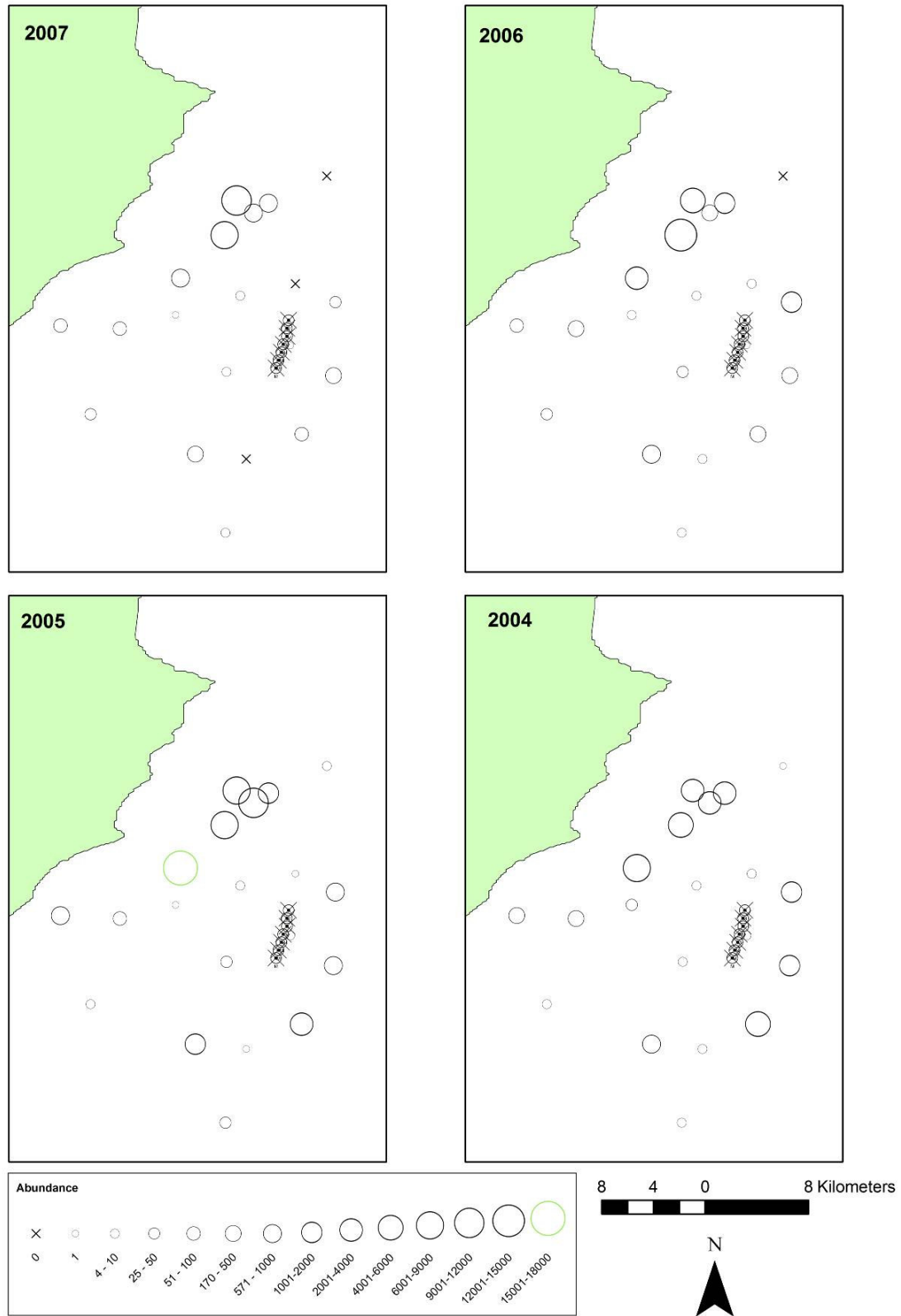


Figure 3.2.4 Total number of countable invertebrates per anchor dredge site (October 2004, June 2005, June 2006 & May 2007)

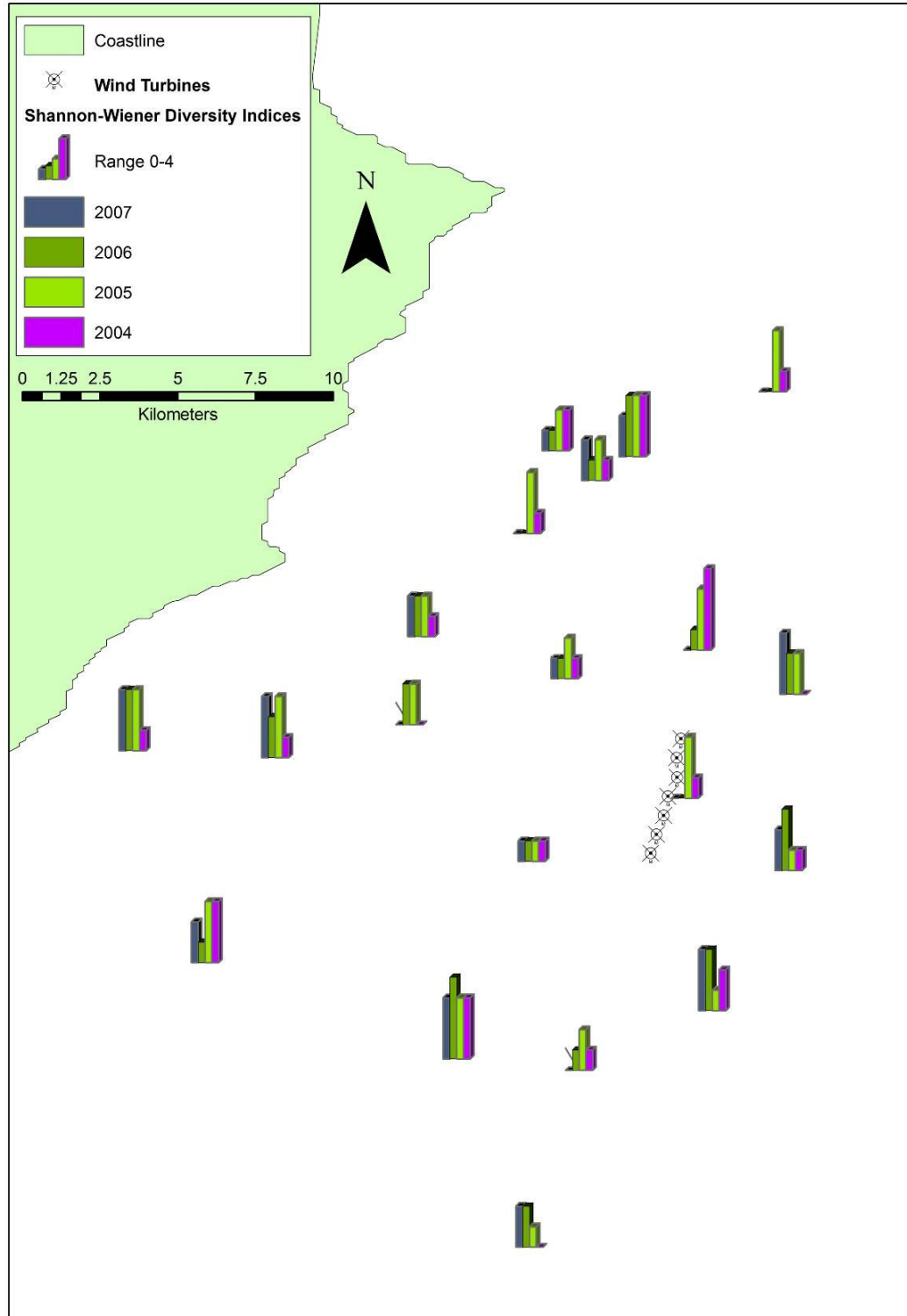


Figure 3.2.5 Shannon Wiener diversity indices per anchor dredge site (October 2004, June 2005, June 2006 & May 2007)

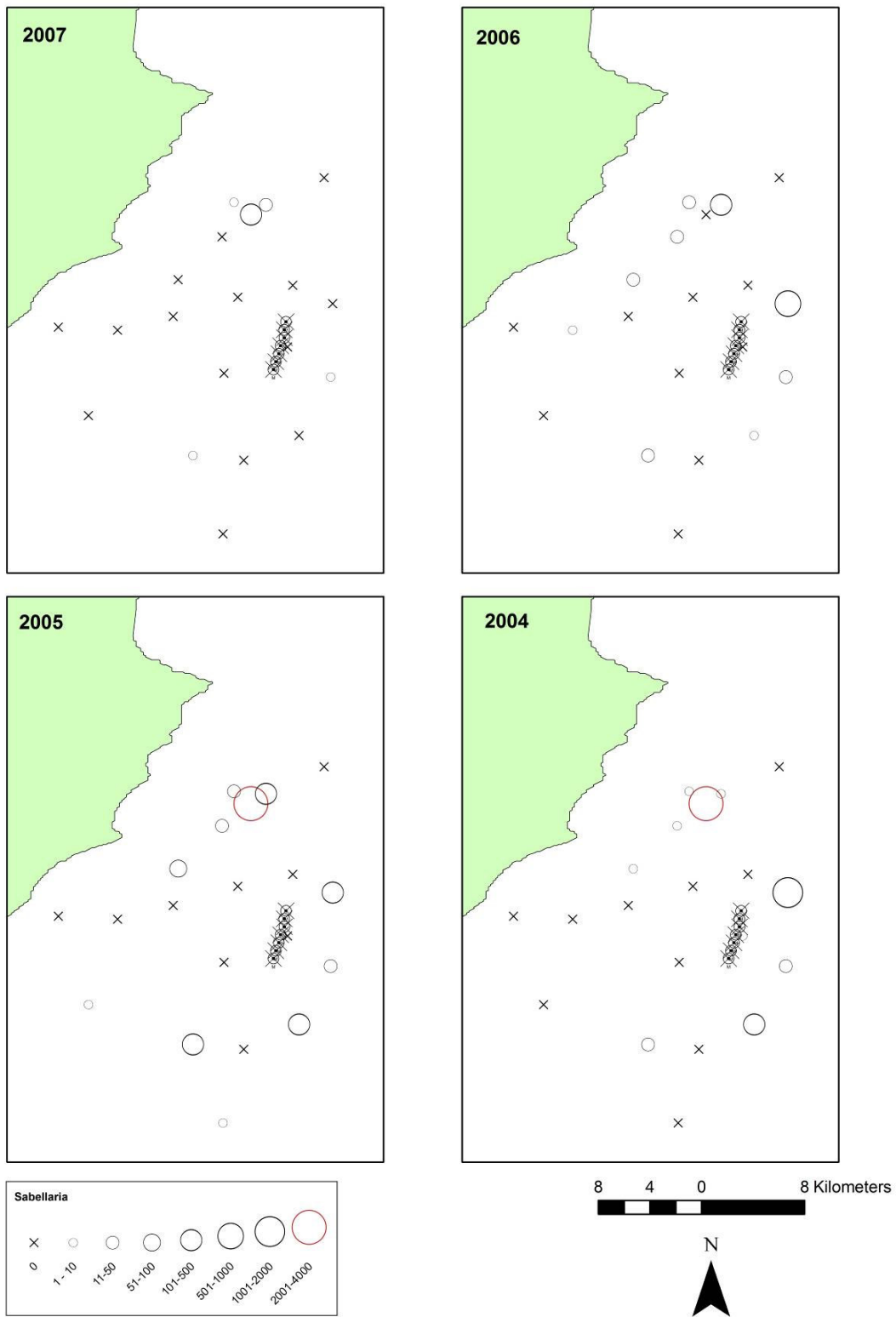


Figure 3.2.6 Total number of *Sabellaria* spp found at each dredge sample site in October 2004, June 2005, June 2006 and May 2007.

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Annelid	Serpulidae	<i>Pomatoceros lamarcki</i>	0	0	0	5976	8136	1	362	0	1	23	4	0	0	4	0	0	0	251	0	0	14758
Mollusc	Nuculidae	<i>Nucula nucleus</i>	0	0	0	9	246	7	25	0	1	0	0	0	0	0	0	0	0	185	0	0	473
Annelid	Sabellariidae	<i>Sabellaria alveolata</i>	0	0	0	0	0	419	5	0	0	1	0	0	0	0	0	0	0	0	0	0	425
Annelid	Serpulidae	<i>Pomatoceros triqueter</i>	0	0	0	8	352	1	3	0	0	0	0	0	0	0	0	0	0	2	0	0	366
Annelid	Serpulidae	<i>Serpulidae</i>	0	0	0	102	65	0	42	0	0	0	0	0	0	0	0	0	0	28	0	0	237
Tunicata	Styellidae	<i>Dendrodoa grossularia</i>	0	5	0	14	30	0	42	0	0	47	1	0	0	6	0	0	0	5	0	0	150
Crustacea	Porecellanidae	<i>Pisidia longicornis</i>	0	0	0	0	3	126	1	0	0	1	0	0	0	0	0	0	0	0	0	0	131
Mollusc	Lepidopleuridae	<i>Leptochiton asellus</i>	0	1	0	5	9	0	5	0	2	56	13	0	0	11	0	0	0	15	0	0	117
Annelid	Maldanidae	<i>Clymenura</i> sp.	9	9	0	0	6	0	5	0	0	2	15	0	0	33	0	0	0	10	0	0	89
Crustacea	Balanadae	<i>Balanus crenatus</i>	0	0	0	1	25	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84
Annelid	Serpulidae	<i>Circeis spirillum</i>	0	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	76

Table3.2.3 List of the most abundant taxa (where >70 individuals were recorded across the survey area) in descending order of abundance from the anchor dredge survey of May 2007.

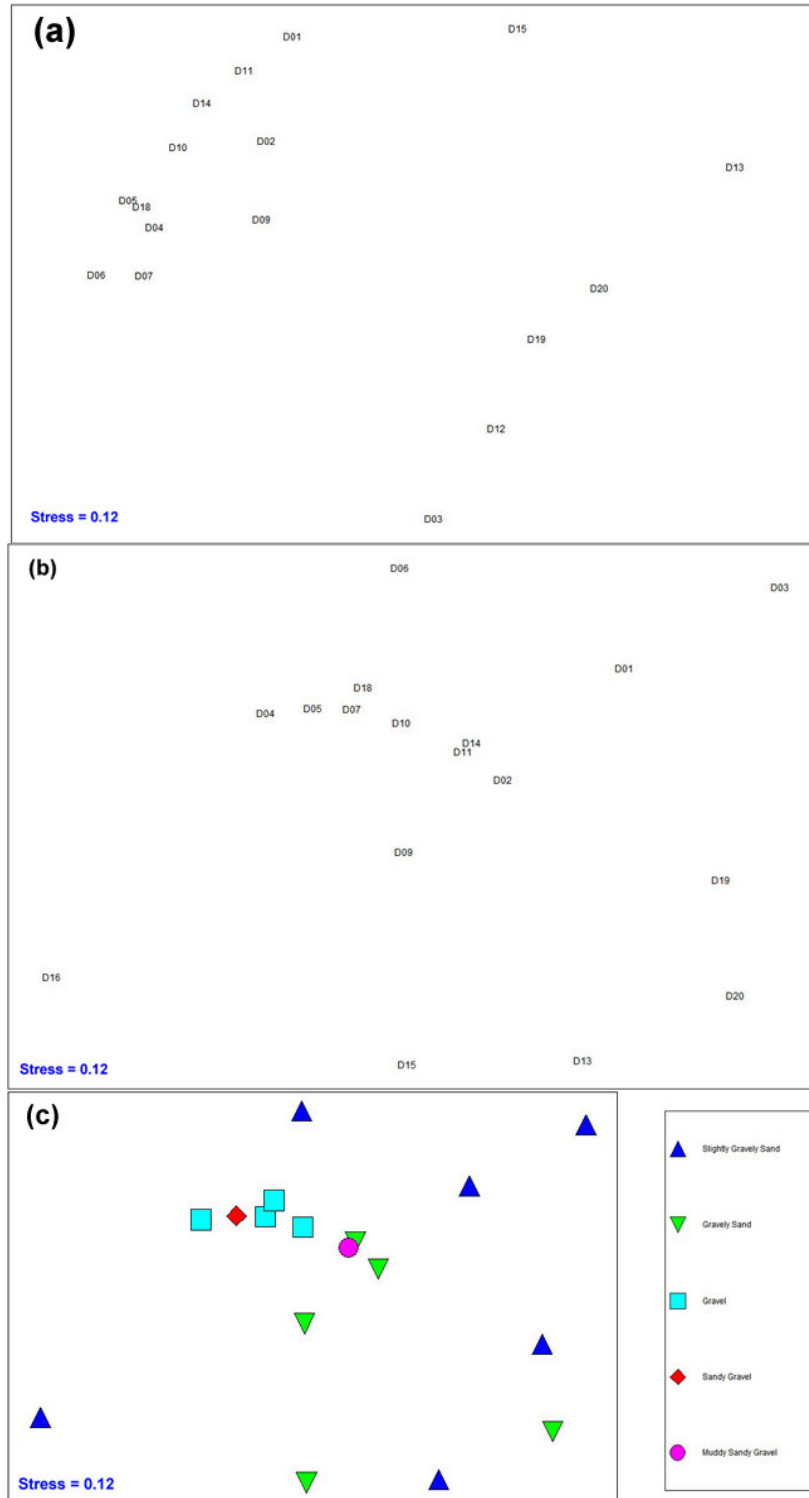


Figure 3.2.7 Multi-dimensional scaling plot of faunal data from the anchor dredge survey, May 2007. [(a) Presence/Absence data; (b) Abundance data, colonial organisms removed; (c) Rotated nMDS plot of dredge dataset (abundance data; No colonial's), with sedimentary environment superimposed]

3.3 Biotope Classification

Because of the nature of the current monitoring survey and the inherent differences in sampling protocol undertaken in both study types, direct comparison of the datasets is difficult. As such, it is easier to assess the communities identified in each of the surveys to assess potential change in the benthos compared to the baseline survey. The baseline survey undertaken in 2000 identified six separate biotopes within the survey (Ecoserve 2001) area using the 1997 JNCC classification system (Connor *et al*, 1997). These are presented in Table 3.3.1.

Biotope Classification	Description of Biotope	Approximate location within the survey area
IGS.Mob	Sparse fauna in infralittoral mobile clean sand	Along the Arklow Bank and to the south-west of the survey area. Small presence closer inshore near Arklow.
IGS.Scup.Hyd	<i>Sertularia cupressina</i> and <i>Hydrallmania falcata</i> on tide swept sublittoral cobbles or pebbles in coarse sand	Immediately surrounding the Arklow Bank, and also dominating the north-east corner of the survey area
MCR.CSab	Cirralittoral <i>Sabellaria</i> reefs	Present north-west of the survey area. Also small patches located to the west of the survey area towards Arklow.
MCR	Cirralittoral rock or mixed substrata in moderately exposed environments.	Immediately to the east of the Arklow Bank.
MCR.Flu	<i>Flustra foliacea</i> and other hydroid/bryozoan turf species on slightly scoured cirralittoral rock or mixed substrata	To the north-west of the survey area surrounding MCR.CSab
IMS	Infralittoral clean or muddy sand	Immediately within the vicinity of Arklow Town.

Table 3.3.1 Biotope classifications identified in baseline survey (Ecoserve, 2001)

The current data is presented in Table 3.3.2 with the sampling positions broadly classified using the JNCC classification scheme for marine biotopes. To facilitate comparison with the baseline data, the 1997 JNCC classification was used (Connor *et al.*, 1997).

Biotope Classification		Biotope Classification	
Station 1	MCR Circalittoral rock or mixed substrata in moderately exposed environments. [No Change]	Station 11	MCR Circalittoral rock or mixed substrata in moderately exposed environments. [No Change]
Station 2	MCR Circalittoral rock or mixed substrata in moderately exposed environments. [No Change]	Station 12	IGS.Mob Sparse fauna in infralittoral mobile clean sand# [No Change]
Station 3	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]	Station 13	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]
Station 4	MCR.Flu.SerHyd <i>Sertularia argentea</i> , <i>S. cupressina</i> and <i>Hydrallmania falcata</i> on tide swept circalittoral cobbles and pebbles [No Change]	Station 14	MCR.Flu.Flu (<i>Flustra foliacea</i> on slightly scoured silty circalittoral rock or mixed substrata). [Previously IGS.Mob Sparse fauna in infralittoral mobile clean sand]
Station 5	MCR.Flu.SerHyd <i>Sertularia argentea</i> , <i>S. cupressina</i> and <i>Hydrallmania falcata</i> on tide swept circalittoral cobbles and pebbles [No Change]	Station 15	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]
Station 6	MCR.CSab Circalittoral <i>Sabellaria</i> reefs [Previously MCR.Myt.Has <i>Mytilus edulis</i> beds with hydroids and ascidians in tide swept moderately exposed circalittoral rock and mixed sediments]	Station 16	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]
Station 7	MCR Circalittoral rock or mixed substrata in moderately exposed environments. [Previously MCR.CSab Circalittoral <i>Sabellaria</i> reefs]	Station 17	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]
Station 8	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]	Station 18	MCR.Flu.Flu (<i>Flustra foliacea</i> on slightly scoured silty circalittoral rock or mixed substrata). [Previously MCR Circalittoral rock or mixed substrata in moderately exposed environments.]
Station 9	MCR.Flu.Flu (<i>Flustra foliacea</i> on slightly scoured silty circalittoral rock or mixed substrata). [Previously MCR.CSab Circalittoral <i>Sabellaria</i> reefs]	Station 19	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]
Station 10	MCR Circalittoral rock or mixed substrata in moderately exposed environments. [No Change]	Station 20	IGS.Mob Sparse fauna in infralittoral mobile clean sand [No Change]

Table 3.3.2 Biotope classifications identified in the present survey (May 2007).

4. DISCUSSION AND CONCLUSIONS

The survey area which is investigated in the present survey is characterised by a range of sediments ranging from fine sands to gravel and this is reflected in the fish and invertebrate species found in the present survey.

Previous reviews have shown that the fish species expected to be found in these habitats are pretty similar. In sandy areas <50m depth species diversity is reported to be pretty high with many elasmobranchs, gadoids, wrasses and flatfish. This is similar to species found in gravel areas <50m depth (Nash, 1990). The fish species which were found in the present survey are consistent with those found in previous surveys. Two species have been recorded in the present survey which were not previously recorded, the Turbot (*Psetta maxima*) and the black scorpion fish (*Scorpaena porcus*). Overall species and abundances are down on previous years, although the species which have been identified during the present and in previous trawl surveys are considered common throughout the survey area and within the Irish Sea (Ellis *et al.*, 2000).

There have been no records in the present survey of rare or unusual species. This is concurrent with findings in previous surveys with no rare or unusual species recorded in the survey area.

The sand goby, *Pomatoschistus minutus*, which was recorded in previous surveys (July 2004 & October 2004), is not recorded in the present survey. It was also not recorded in the previous surveys of June 2006 & June 2005.

Other species of importance found during the present survey include the reef forming Serpulid worms, *Sabellaria alveolata* and *Sabellaria spinulosa*. These are found across the survey area, although extensive reefs have only been reported in localised parts. These biogenic reefs are very important and are listed under Annex I of the EU Habitats Directive (Code 1170: Reefs). These reefs play an important role in stabilising sediments, in addition to improving species diversity and community stability (Holt *et al.*, 1998). In the present survey, a large number of *Sabellaria* spp. were encountered at Trawl Stations 3 & 4. In addition, dredge sample 6 returned 459 *Sabellaria* in the present survey compared to 0 in 2006. However it was recorded in high abundances in 2005 (3,589) and 2004 (3,280). It is expected that the variation in results over the years is related to sampling induced differences in terms of sample positioning and the heterogeneous nature of the benthos within this area.

A detailed look of the biotope community's reveals a similar pattern to that found in the baseline survey. The Arklow Bank samples (dredge stations 8, 12, 16 & 17), in addition to the samples located to the south and west of the bank (dredge stations 3, 13, 15, 19 & 20), are all classified as IGS.Mob (Sparse fauna in infralittoral mobile clean sand). This is concurrent with the results of the baseline survey which showed similar distribution patterns for this community type (although it was interspersed with IGS.Scup.Hyd [*Sertularia cupressina* and *Hydrallmania falcata* on tide swept sublittoral cobbles or pebbles in coarse sand]). This is similar to results obtained in last years study.

Immediately to the east of the Arklow Bank two stations are classified as MCR (Circalittoral rock or mixed substrata in moderately exposed environments) or MCR.Flu.Flu (*Flustra foliacea* on slightly scoured silty circalittoral rock or mixed substrata). This corresponds with a similar distribution pattern for this habitat type in the baseline survey. Further dredge stations are classified as MCR across the survey area. The three inner shore sites (dredge stations 1, 2 & 18) all correspond to the MCR/MCR.FluFlu biotope classification.

Two stations (Stations 7 & 9) identified in the previous survey as MCR.CSab (Circalittoral *Sabellaria* reefs) now classify as MCR/MCR.Flu.Flu. The change of community from a *Sabellaria* reef to a mixed sediment community reflects the localised distribution of the reefs in the area.

A single station, dredge station 6, is classified as MCR.CSab (Circalittoral *Sabellaria* reefs). This is the only sampling station to return large abundances of *Sabellaria* spp. This site

returned significantly different fauna in the previous survey (this station was classified as MCR.Myt.Has *Mytilus edulis* beds with hydroids and ascidians in tide swept moderately exposed circalittoral rock and mixed sediments). Only a single *Mytilus edulis* was recorded from this site during the course of the present survey. A *Sabellaria* reef has been identified at this location in 2004 and 2005.

Two stations in the immediate vicinity of station 6, (dredge stations 4 & 5) are classified as MCRFlu.SerHyd (*Sertularia argentea*, *S. cupressina* and *Hydrallmania falcata* on tide swept circalittoral cobbles and pebbles). This corresponds with the classification of MCR.Flu.Flu (*Flustra foliacea* and other hydroid/bryozoan turf species on slightly scoured circalittoral rock or mixed substrata) from the baseline survey for the same region.

Overall results indicate that there are large differences between the current dataset and those obtained for previous surveys. These differences relate to the numbers of taxa encountered and the numbers of individuals in each of the anchor dredge samples. The opposite appears to be the case for the beam trawl survey. Numbers of taxa and countable fauna are increased when compared to results obtained in previous surveys. This is a similar trend on last year's survey, where increases in the number of taxa and countable invertebrates in the trawl survey and a decrease in taxa and organisms from the anchor dredge results.

Similar to previous surveys, MDS analysis indicate well established similarities in the present dataset which corresponds to results obtained in previous surveys. The gravel dominated sites all cluster together, and there is a large degree of variation in the sand dominated sites. This is related to the sparse faunal abundances and taxa numbers at these sandy sites.

Overall results from the present survey indicate that there is very little variation at the community level between the communities recorded in the present survey and the communities recorded in the baseline survey. There do however, appear to be large changes in both the taxa numbers and individual abundance between the current survey and previous surveys (June 2006, October 2004 and June 2005). The reasons for these are unclear, although it may be related in part to the sediment heterogeneity and small scale, localised changes in the area, which is typical of mixed communities which are present here. In addition, changes in the sediment matrix at several stations may reflect an increase in scouring at locations across the sampling area and cause a suppression of both species abundances and diversity.

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6. APPENDICES

Appendix 6.1 Species List for Beam Trawl Survey; May 2007

PISCES

Agonus catophractus
Callionymus lyra
Pleuronectes platessa
Psetta maxima
Pholis gunnellus
Scorpaena porcus
Gobius niger

CRUSTACEA

Balanus crenatus
Sacculina carcini
Ascidicola rosea
Gastrosaccus spinifer
Schistomysis spiritus
Iphimedia minuta
Gammarellus homari
Parapleustes bicuspis
Stenothoe marina
Liljeborgia pallida
Atylus swammerdamei
Ampelisca spinipes
Abludomelita obtusata
Abludomelita obtusata (Type A)
Maera othonis
Gammaropsis maculata
Gammaropsis nitida
Unciola crenatipalma
Meganyctiphanes norvegica
 DECAPODA (zoea)
Pasiphaea sivado
Hippolyte varians
Pandalina brevirostris
Pandalus montagui
Philocheras trispinosus
Crangon allmanni
Pontophilus spinosus
Pagurus bernhardus
Pisidia longicornis
Hyas coarctatus
Macropodia rostrata
Corystes cassivelaunus
Corystes cassivelaunus (juv)
Cancer pagurus
Cancer pagurus (juv)
Liocarcinus (juv)
Liocarcinus holsatus
Necora puber
Pilumnus hirtellus
Pinnotheres pisum

CNIDARIA

ATHECATA
Tubulariidae
Sarsia
Eudendrium
Bougainvilliidae
Hydractinia echinata

Campanulariidae
Clytia hemisphaerica
Alcyonium digitatum

ACTINIARIA

Calycella syringa
Abietinaria abietina
Diphasia
Hydrallmania falcata
Sertularella
Sertularia
Tamarisca tamarisca
Tridentata distans
Plumulariidae
Nemertesia
Plumularia setacea

ANNELIDA

Aphrodita aculeata
Subadyte pellucida
Alentia gelatinosa
Gattyana cirrhosa
Harmothoe impar
Malmgreniella arenicolae
Lepidonotus squamatus
Polynoe scolopendrina
Sthenelais boa
Eulalia ornata
Pterocirrus macroceros
Psamathe fusca
Syllis
Syllis armillaris
Sphaerosyllis taylori
Autolytus
Nereis longissima
Nereis zonata
Nephtys longosetosa
Flabelligera affinis
Notomastus
Sabellaria alveolata
Sabellaria spinulosa
Axionice maculata
Thelepus cincinnatus
Thelepus setosus
Chone
Jasmineira elegans
Sabella pavonina
Serpulidae
Hydroides norvegica
Pomatoceros lamarcki
Circeis spirillum
Myzostomum cirriferum

MOLLUSCA

Neomenia carinata
Leptochiton asellus
Gibbula tumida
Calliostoma zizyphinum
Buccinum undatum

NUDIBRANCHIA (eggs)
Lomanotus marmoratus
Dendronotus frondosus
Doto
Cuthona
Mytilus edulis
Mytilus edulis (juv)
Modiolarca tumida
Modiolus modiolus
Chlamys varia
Aequipecten opercularis
Anomiidae (juv)
Spisula solida (juv)
Mya truncata (juv)
Sphenia binghami
Hiatella arctica
Eledone cirrhosa (juv)

BRYOZOA

Crisia
Eurystrotos compacta
Alcyonidium diaphanum
Alcyonidium gelatinosum
Alcyonidium mytili
Alcyonidium parasiticum
Nolella
Vesicularia spinosa
Amathia lendigera
Bowerbankia
Aetea
Eucratea loricata
Electra pilosa
Flustra foliacea
Bicelliarella ciliata
Scrupocellaria scruposa
Escharella immersa
Escharella ventricosa
Schizomavella auriculata
Cellepora pumicosa
Turbicellepora avicularis
Omalosecosa ramulosa

ECHINODERMATA

Antedon bifida
Asterias rubens
Ophiothrix fragilis
Ophiopholis aculeata
Amphiuridae (juv)
Amphiura filiformis
Ophiura albida
Echinus esculentus (juv)
Psammechinus miliaris
Psammechinus miliaris (juv)

TUNICATA

ASCIDIACEA (juv)
Asciidiidae
Asciidiella scabra
Dendrodoa grossularia
Botrylloides leachi
Molgula

CHELICERATA

Nymphon brevirostre
Pycnogonum littorale

ALGAE

Ceramium
Polysiphonia
Desmarestia aculeata

PORIFERA

Porifera sp

CTENOPHORA

Ctenophora

NEMERTEA

Nemertea sp.

NEMATODA

Nematoda

ENTOPROCTA

Loxosomella
Pedicellina

SIPUNCULA

Golfingia elongata
Golfingia vulgaris

Appendix 6.2 Species List for Anchor Dredge Survey; May 2007**ANNELIDA**

Ampharete lindstroemi
Anaitides groenlandica
Anobothrus gracilis
Aonides paucibranchiata
Aphelochaeta (Type A)
Aricidea catherinae
Autolytus
Axonice maculata
Caulleriella alata
Chaetozone zetlandica
Chone
Circeis spirillum
Clymenura
Demonax
Ehlersia ferrugina
Eteone longa (agg)
Euclymene 'Species A'
Eulalia ornata
Eumida bahusiensis
Eumida sanguinea
Eusyllis assimilis
Eusyllis blomstrandii
Exogone verugera
Galathowenia oculata
Glycera lapidum (agg)
Glycera oxycephala
Glycera tridactyla
Glycinde nordmanni
Harmothoe imbricata
Harmothoe impar
Hydroides norvegica
Jasmineira elegans
Lagis koreni
Lanice conchilega
Laonice bahusiensis
Lepidonotus squamatus
Lumbrineris gracilis
Lumbrineris latreilli
Lysilla loveni
Malmgreniella arenicolae
Marphysa bellii
Mediomastus fragilis
Nematoneis unicornis
Nephtys (juv)
Nephtys caeca
Nephtys cirrosa
Nephtys hombergii
Nephtys longesetosa
Nereis longissima
Nereis zonata

Notocirrus scoticus
Notomastus
Ophelia borealis
Ophelina acuminata
Owenia fusiformis
Paradoneis lyra
Paranaitis kosteriensis
Peresiella clymenoides
Pholoe baltica
Pholoe inornata
Podarkeopsis capensis
Poecilochaetus serpens
Polycirrus
Polydora caeca (agg)
Polydora caulleryi
Polydora ciliata (Type A)
Polynoe scolopendrina
Pomatoceros lamarcki
Pomatoceros triqueter
Praxillella affinis
Protodorvillea kefersteini
Psamathe fusca
Sabellaria alveolata
Sabellaria spinulosa
Sabellides octocirrata
Scalibregma celticum
Scoloplos armiger
Serpulidae
Sphaerosyllis taylori
Spio armata (agg)
Spio martinensis
Spiochaetopterus
Spiophanes bombyx
Spiophanes kroyeri
Sthenelais boa
Syllides
Syllis
Syllis 'Species G'
Syllis armillaris
Syllis variegata
Tharyx killariensis
Thelepus cincinnatus
Thelepus setosus
Travisia forbesii

BRYOZOA

Aetea truncata
Alcyonidium diaphanum
Alcyonidium mytili
Alcyonidium parasiticum
Amathia lendigera
Amphiblestrum auritum
Bicellariella ciliata
Bugula avicularia
Cellepora pumicosa
Chorizopora brongiarti
Collarina balzaci
Conopeum reticulum
Cribrillinidae
Crisia
Disporella hispida
Electra monostachys
Electra pilosa
Entalophoroecia deflexa
Escharella immersa
Escharella labiosa
Escharella variolosa
Escharella ventricosa
Escharina johnstoni
Eucratea loricata
Eurystrotos compacta
Fenestrulina malusii
Flustra foliacea
Hippoporina pertusa
Hippothoa divaricata
Microporella ciliata
Plagioecia sarniensis
Porella concinna
Schizomavella auriculata
Schizomavella linearis
Scruparia ambigua
Scruparia chelata
Scrupocellaria scruposa
Tubulipora
Turbicellepora avicularis
Vesicularia spinosa

CHELICERATA

Nymphon brevirostre

CILLIAPHORA

Lagotia viridis

CNIDARIA

Abietinaria abietina
ACTINIARIA
Alcyonium digitatum
ATHECATA
Bougainvilliidae
Calycella syringa
Campanularia volubilis
Campanulariidae
Clytia hemisphaerica
Coryne
Diphasia attenuata
Edwardsia claparedii
Eudendrium
Halecium
Hydrallmania falcata
Kirchenpaueria pinnata
Plumularia setacea
Sertularella
Sertularia
Tamarisca tamarisca
Tubularia sp.

CRUSTACEA

Ampelisca diadema
Ampelisca spinipes
Anthura gracilis
Balanus balanus
Balanus crenatus
Bathyporeia elegans
Bodotria scorpioides
Crassikorophium bonnellii
Crassikorophium crassicorne
Erichthonius (female)
Erichthonius punctatus
Gammaropsis maculata
Gnathia oxyuraea
Harpinia pectinata
Hippolytidae (juv)
Hyas araneus (juv)
Janira maculosa
Leptocheirus pectinatus
Liljeborgia pallida
Maera othonis
Maerella tenuimana
Monocorophium sextonae
Nannonyx goesii
Paguridae (juv)
Pagurus bernhardus
Parapleustes bicuspis
Pariambus typicus
Pisidia longicornis
Stenothoe marina
Stenothoe tergestinum

Tritaeta gibbosa

Unciola crenatipalma
Urothoe elegans
Verruca stroemia

ECHINODERMATA

Acrocrida brachiata
Amphipholis squamata
Amphiura filiformis
Amphiuridae
ECHINOIDA (juv)
Ophiothrix fragilis
Ophiura ophiura
Pedicellina
Psammechinus miliaris
Psammechinus miliaris (juv)

MOLLUSCA

Abra alba
Abra prismatica
Acanthochitona crinitus
Anomiidae (juv)
Buccinum undatum
Chrysallida interstincta
Diodora graeca
Doto
Gari tellinella
Hiatella arctica
Lamellaria perspicua
Leptochiton asellus
Limacia clavigera
Modiolarca tumida
Modiolus (juv)
Modiolus modiolus
Modiolus modiolus (juv)
Musculus discors
Mya truncate (juv)
Mysella bidentata
Mytilus edulis
Nucula nucleus
NUDIBRANCHIA (eggs)
Oenopota rufa
Palliolum tigrinum
Pododesmus patelliformis
Sphenia binghami
Spisula solida
Timoclea ovata

NEMATODA

Nematoda spp.

NEMERTEA

Nemertea spp.

PHORONIDA

Phoronis

PORIFERA

Cliona
Leucosolenia
Porifera Indet.
Scypha ciliata

RHODOPHYTA

Corallinaceae

SIPUNCULA

Golfingia elongata
Golfingia vulgaris
Nephasoma minutum
Phascolion strombus

TUNICATA

ASCIDIACEA (juv)
ASCIDIACEA (larva)
Asciella
Asciella scabra
Asciidae
Dendrodoa grossularia
Didemnidae
Molgula sp.
Polycarpa fibrosa
Polycarpa pomaria

Appendix 6.3 Total results from the Beam Trawl May 2007

Trawl Description

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
Description	Good trawl. Sample contained large amounts of bryozoans and stones. Large abundances of <i>Flustra</i> present	Relatively small volume present in Trawl.	Good Trawl. Contained large numbers of starfish. Very large number of <i>Sabellaria</i> present in the trawl.	Good sample. Trawl contained large numbers of Bryozoans and starfish. Trawl contained very large numbers of <i>Sabellaria</i> reef.	Small volume. Trawl contained Urchins, crab and starfish.	Good Trawl. Sample contained large amounts of bryozoans and stones. Large abundances of <i>Flustra</i> present. Large Boulder present.
Date of hauling	23/05/2007	23/05/2007	22/05/2007	22/05/2007	22/05/2007	22/05/2007
Time of hauling	09:35	10:30	17:00	16:10	11:35	13:20
Layback/warp (m)	75	125	125	150	175	200
Speed of Vessel (kts)	2.4	2	2.3	2.5	2.3	2.3
Vessel Bearing	180°	0°	0°	0°	180°	180°
Distance of Trawl (m)	800m	560m	680m	950m	590m	800m

Table of Contents for the Beam Trawls taken during the course of the May 2007 Survey.

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Psetta maxima</i>	0	1	0	0	0	0
<i>Scorpaena porcus</i>	0	0	2	0	0	0
<i>Agonus cataphractus</i>	0	0	1	0	0	1
<i>Pleuronectes platessa (juv)</i>	0	0	0	0	2	0
<i>Pholis gunnellus</i>	0	0	3	0	0	0
<i>Gobius niger</i>	0	0	3	0	0	0
<i>Callionymus lyra</i>	2	1	2	0	0	0
<i>Sabellaria alveolata</i>	35	3	1752	293	0	0
<i>Pisidia longicornis</i>	17	0	939	70	5	2
<i>Antedon bifida</i>	8	1	176	1	0	0
<i>Asterias rubens</i>	10	1	67	46	6	1
<i>Asciidiella scabra</i>	0	0	52	4	0	0
<i>Pagurus bernhardus</i>	1	2	22	4	16	9
<i>Psammechinus miliaris</i>	25	0	0	9	19	0
<i>Crangon allmanni</i>	32	3	2	2	9	4
<i>Macropodia rostrata</i>	8	1	0	3	19	8
<i>Liocarcinus (juv)</i>	1	2	1	2	28	5
<i>Circeis spirillum</i>	0	23	10	0	2	0
<i>Balanus crenatus</i>	0	14	12	5	1	2
<i>Myzostomum cirriferum</i>	0	0	32	0	0	0
<i>Hyas coarctatus</i>	8	1	1	1	11	10
<i>Harmothoe impar</i>	0	0	26	0	2	0
ACTINIARIA	1	0	21	3	0	2

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Necora puber</i>	0	0	12	10	0	0
<i>Eulalia ornata</i>	0	0	19	2	0	0
<i>Golfingia vulgaris</i>	0	0	19	1	0	0
CTENOPHORA	0	17	0	0	0	0
<i>Schistomysis spiritus</i>	10	5	1	0	1	0
<i>Pasiphaea sivado</i>	0	0	0	2	9	4
<i>Pilumnus hirtellus</i>	0	0	14	0	0	0
<i>Pandalus montagui</i>	0	0	7	1	2	3
<i>Thelepus setosus</i>	4	0	0	0	3	5
<i>Cancer pagurus</i>	0	0	12	0	0	0
<i>Meganyctiphanes norvegica</i>	0	0	0	0	0	11
<i>Unciola crenatipalma</i>	0	0	7	3	0	0
<i>Leptochiton asellus</i>	2	0	0	1	7	0
<i>Buccinum undatum</i>	4	0	0	4	2	0
<i>Lepidonotus squamatus</i>	1	0	6	2	0	0
<i>Aequipecten opercularis</i>	0	0	0	9	0	0
<i>Sabellaria spinulosa</i>	1	0	0	6	1	0
<i>Liocarcinus holsatus</i>	0	0	0	3	4	1
Anomiidae (juv)	0	0	0	1	7	0
<i>Nephtys longosetosa</i>	0	2	0	1	0	4
<i>Abludomelita obtusata</i>	6	0	0	0	1	0
<i>Pycnogonum littorale</i>	3	0	0	1	1	1
<i>Modiolus modiolus</i>	0	0	0	3	1	2
<i>Aphrodita aculeata</i>	3	1	0	0	1	0
<i>Philocheirus trispinosus</i>	0	0	4	1	0	0
<i>Cancer pagurus</i> (juv)	0	0	5	0	0	0
<i>Mytilus edulis</i> (juv)	1	0	0	1	3	0
<i>Modiolarca tumida</i>	1	0	2	2	0	0
<i>Alentia gelatinosa</i>	0	0	2	2	0	0
<i>Nereis zonata</i>	0	0	1	1	2	0
<i>Thelepus cincinnatus</i>	0	0	0	0	4	0
Serpulidae	1	0	1	0	2	0
<i>Pomatoceros lamarcki</i>	3	0	0	0	1	0
<i>Pandalina brevirostris</i>	3	0	0	0	1	0
<i>Ophiothrix fragilis</i>	0	0	2	0	1	1
<i>Psammecchinus miliaris</i> (juv)	0	0	4	0	0	0
<i>Molgula</i>	0	1	1	0	0	2
<i>Sthenelais boa</i>	0	0	2	0	0	1
<i>Pterocirrus macroceros</i>	0	0	1	2	0	0
<i>Nereis longissima</i>	1	0	2	0	0	0
<i>Sacculina carcini</i>	0	0	0	3	0	0
<i>Gammaropsis maculata</i>	0	0	2	1	0	0
<i>Gammaropsis nitida</i>	0	0	1	0	0	2
<i>Doto</i>	1	0	0	0	2	0
<i>Dendrodoa grossularia</i>	0	0	0	0	3	0
NEMERTEA	0	0	1	1	0	0
NEMATODA	0	0	0	0	2	0
<i>Subadyte pellucida</i>	0	0	2	0	0	0

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Polynoe scolopendrina</i>	2	0	0	0	0	0
<i>Hydroides norvegica</i>	0	0	0	0	2	0
<i>Gammarellus homari</i>	0	0	2	0	0	0
<i>Parapleustes bicuspis</i>	0	0	0	0	1	1
<i>Abludomelita obtusata (Type A)</i>	0	0	1	0	1	0
<i>Hippolyte varians</i>	1	0	0	0	1	0
<i>Calliostoma zizyphinum</i>	0	0	0	1	0	1
<i>Dendronotus frondosus</i>	0	0	0	0	1	1
<i>Hiatella arctica</i>	0	0	2	0	0	0
<i>Golfingia elongata</i>	1	0	0	0	0	0
<i>Gattyana cirrhosa</i>	0	0	0	0	1	0
<i>Malmgreniella arenicolae</i>	0	0	0	0	1	0
<i>Psamathe fusca</i>	0	0	1	0	0	0
<i>Syllis</i>	0	0	0	0	1	0
<i>Syllis armillaris</i>	0	0	1	0	0	0
<i>Sphaerosyllis taylori</i>	0	0	0	0	1	0
<i>Autolytus</i>	0	0	1	0	0	0
<i>Flabelligera affinis</i>	0	0	0	0	1	0
<i>Notomastus</i>	0	0	1	0	0	0
<i>Axionice maculata</i>	0	0	0	0	1	0
<i>Chone</i>	1	0	0	0	0	0
<i>Jasmineira elegans</i>	0	0	0	1	0	0
<i>Sabella pavonina</i>	0	0	0	0	0	1
<i>Nymphon brevistrore</i>	1	0	0	0	0	0
<i>Ascidicola rosea</i>	0	0	1	0	0	0
<i>Gastrosaccus spinifer</i>	0	0	0	0	0	1
<i>Lphimedia minuta</i>	1	0	0	0	0	0
<i>Stenothoe marina</i>	1	0	0	0	0	0
<i>Liljeborgia pallida</i>	0	0	1	0	0	0
<i>Atylus swammerdamei</i>	0	1	0	0	0	0
<i>Ampelisca spinipes</i>	0	0	0	0	1	0
<i>Maera othonis</i>	0	0	0	0	1	0
DECAPODA	0	0	1	0	0	0
<i>Pontophilus spinosus</i>	0	0	0	0	1	0
<i>Corystes cassivelaunus (megalopa)</i>	1	0	0	0	0	0
<i>Corystes cassivelaunus (juv)</i>	0	0	1	0	0	0
<i>Pinnotheres pisum</i>	0	0	0	0	1	0
<i>Neomenia carinata</i>	0	0	0	0	1	0
<i>Gibbula tumida</i>	0	0	0	1	0	0
<i>Lomanotus marmoratus</i>	1	0	0	0	0	0
<i>Cuthona</i>	0	0	1	0	0	0
<i>Mytilus edulis</i>	0	0	1	0	0	0
<i>Chlamys varia</i>	0	0	0	1	0	0
<i>Spisula solida (juv)</i>	0	0	0	0	0	1
<i>Mya truncata (juv)</i>	0	0	1	0	0	0
<i>Sphenia binghami</i>	0	0	0	1	0	0
<i>Eledone cirrhosa (juv)</i>	0	0	1	0	0	0
<i>Ophiopholis aculeata</i>	0	0	1	0	0	0

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Amphiuridae (juv)</i>	0	0	1	0	0	0
<i>Amphiura filiformis</i>	0	0	0	0	1	0
<i>Ophiura albida</i>	0	0	0	0	1	0
<i>Echinus esculentus (juv)</i>	0	0	0	0	0	1
ASCIDIACEA (juv)	0	0	0	0	1	0
<i>Ciliata septentrionalis</i>	0	0	1	0	0	0
<i>Ceramium</i>	P	0	0	0	0	0
<i>Polysiphonia</i>	P	0	0	0	0	0
<i>Desmarestia aculeata</i>	P	P	0	0	0	0
PORIFERA	P	0	0	0	0	P
ATHECATA	0	0	0	0	P	0
<i>Tubulariidae</i>	0	0	P	0	P	0
<i>Sarsia</i>	0	P	0	0	0	P
<i>Eudendrium</i>	P	P	0	0	0	P
<i>Bougainvilliidae</i>	P	P	P	P	P	P
<i>Hydractinia echinata</i>	0	0	0	0	P	P
<i>Campanulariidae</i>	0	P	0	0	0	0
<i>Clytia hemisphaerica</i>	P	P	P	P	P	P
<i>Alcyonium digitatum</i>	0	0	0	0	P	0
<i>Calycella syringa</i>	P	0	0	0	0	0
<i>Abietinaria abietina</i>	0	P	P	0	P	0
<i>Diphasia</i>	P	0	0	P	P	P
<i>Hydrallmania falcata</i>	P	P	P	P	P	P
<i>Sertularella</i>	P	0	0	P	0	P
<i>Sertularia</i>	P	P	P	P	P	P
<i>Tamarisca tamarisca</i>	P	0	0	0	P	0
<i>Tridentata distans</i>	0	P	0	0	0	0
<i>Plumulariidae</i>	P	0	0	0	0	0
<i>Nemertesia</i>	P	P	0	0	0	P
<i>Plumularia setacea</i>	0	0	P	0	0	0
<i>Loxosomella</i>	0	0	P	0	0	0
<i>Pedicellina</i>	P	P	0	0	0	0
NUDIBRANCHIA (eggs)	0	P	0	0	0	0
<i>Crisia</i>	0	0	P	P	P	0
<i>Eurystrotos compacta</i>	0	0	P	0	0	0
<i>Alcyonidium diaphanum</i>	P	P	P	0	0	0
<i>Alcyonidium gelatinosum</i>	0	P	0	0	0	0
<i>Alcyonidium mytili</i>	0	0	0	P	P	0
<i>Alcyonidium parasiticum</i>	0	P	0	0	0	P
<i>Nolella</i>	0	0	0	0	0	P
<i>Vesicularia spinosa</i>	P	0	0	0	P	P
<i>Amathia lendigera</i>	0	P	0	0	0	0
<i>Bowerbankia</i>	0	P	0	0	0	P
<i>Aetea</i>	P	0	0	0	0	P
<i>Eucratea loricata</i>	P	0	P	P	0	P
<i>Electra pilosa</i>	P	P	P	P	P	P
<i>Flustra foliacea</i>	P	P	P	P	P	P
<i>Bicellariella ciliata</i>	P	0	P	P	0	P

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Scrupocellaria scruposa</i>	0	0	0	0	P	P
<i>Escharella immersa</i>	0	0	P	0	P	0
<i>Escharella ventricosa</i>	0	0	0	0	P	0
<i>Schizomavella auriculata</i>	0	0	0	0	P	0
<i>Cellepora pumicosa</i>	0	0	P	0	0	0
<i>Turbicellepora avicularis</i>	P	P	P	P	P	P
<i>Omalosecosa ramulosa</i>	0	0	P	P	0	P
Ascidiidae	P	0	0	0	0	0
<i>Botrylloides leachi</i>	P	0	0	P	0	0
<i>Crossaster papposus</i>	5	0	2	0	2	0
Number of Organisms	208	80	3276	512	203	88
Colonial Taxa	26	21	19	15	21	23
Countable Taxa	38	18	63	43	55	29
Total Taxa	64	39	82	58	76	52

Appendix 6.4 Total fish lengths (mm) of all fish species May 2007.

	Trawl 1	Trawl 2	Trawl 3	Trawl 4	Trawl 5	Trawl 6
<i>Psetta maxima</i> (Turbot)	0	1 [310]	0	0	0	0
<i>Scorpaena porcus</i> (Black Scorpion Fish)	0	0	2 [140, 140]	0	0	0
<i>Agonus catophractus</i> (Pogge)	0	0	1 [120]	0	0	1 [90]
<i>Pleuronectes platessa</i> (Plaice)	0	0	0	0	2 [270, 50]	0
<i>Pholis gunnellus</i> (Butterfish)	0	0	3 [100, 100, 110]	0	0	0
<i>Gobius niger</i> (Black Goby)	0	0	3 [100, 100, 110]	0	0	0
<i>Callionymus lyra</i> (Dragonet)	2 [40, 40]	1 [40]	2 [180, 150]	0	0	0

Appendix 6.5 Anchor dredge raw data May 2007

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
ANNELIDA	<i>Ampharete lindstroemi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Anaitides groenlandica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
ANNELIDA	<i>Anobothrus gracilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Aonides paucibranchiata</i>	1	4	0	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Aphelochaeta (Type A)</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
ANNELIDA	<i>Aricidea catherinae</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Autolytus</i>	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	3	0	0
ANNELIDA	<i>Axionice maculata</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Caulleriella alata</i>	0	2	0	0	0	0	1	0	0	0	1	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Chaetozone zetlandica</i>	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Chone</i>	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Circeis spirillum</i>	0	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
ANNELIDA	<i>Clymenura</i>	9	9	0	0	6	0	5	0	0	2	15	0	0	33	0	0	0	10	0	0
ANNELIDA	<i>Demonax</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Ehlersia ferrugina</i>	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Eteone longa (agg)</i>	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Euclymene 'Species A'</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
ANNELIDA	<i>Eulalia ornata</i>	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Eumida bahusiensis</i>	0	0	0	11	2	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0
ANNELIDA	<i>Eumida sanguinea</i>	0	1	0	0	3	4	11	0	0	1	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Eusyllis assimilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
ANNELIDA	<i>Eusyllis blomstrandii</i>	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Exogone verugera</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Galathowenia oculata</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Glycera lapidum (agg)</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
ANNELIDA	<i>Glycera oxycephala</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	P
ANNELIDA	<i>Glycera tridactyla</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
ANNELIDA	<i>Glycinde nordmanni</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Harmothoe imbricata</i>	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
ANNELIDA	<i>Harmothoe impar</i>	0	0	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Hydroides norvegica</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
ANNELIDA	<i>Jasmineira elegans</i>	0	0	0	1	1	9	1	0	0	0	0	0	0	0	0	0	0	2	0	0
ANNELIDA	<i>Lagis koreni</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Lanice conchilega</i>	1	0	0	0	3	0	1	0	0	3	1	0	0	2	0	0	0	7	0	0
ANNELIDA	<i>Laonice bahusiensis</i>	0	1	0	0	0	0	0	0	2	3	3	0	0	13	0	0	0	0	0	0
ANNELIDA	<i>Lepidonotus squamatus</i>	0	0	0	0	4	8	2	0	0	0	0	0	0	0	0	0	0	2	0	0
ANNELIDA	<i>Lumbrineris gracilis</i>	0	1	0	0	0	0	0	0	1	1	5	0	0	16	0	0	0	0	0	0
ANNELIDA	<i>Lumbrineris latreilli</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0
ANNELIDA	<i>Lysilla loveni</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Malmgreniella arenicolae</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Marphysa bellii</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Mediomastus fragilis</i>	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Nematonereis unicornis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Nephtys (juv)</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
ANNELIDA	<i>Nephtys caeca</i>	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ANNELIDA	<i>Nephtys cirrosa</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
ANNELIDA	<i>Nephtys hombergii</i>	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
ANNELIDA	<i>Nephtys longesetosa</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
ANNELIDA	<i>Nereis longissima</i>	2	0	0	0	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0
ANNELIDA	<i>Nereis zonata</i>	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Notocirrus scoticus</i>	P	2	0	0	0	0	0	0	0	2	0	0	4	0	0	0	0	0	0	0
ANNELIDA	<i>Notomastus</i>	0	0	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	19	0
ANNELIDA	<i>Ophelia borealis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2
ANNELIDA	<i>Ophelina acuminata</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
ANNELIDA	<i>Owenia fusiformis</i>	0	2	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
ANNELIDA	<i>Paradoneis lyra</i>	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Paranaitis kosteriensis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ANNELIDA	<i>Peresiella clymenoides</i>	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
ANNELIDA	<i>Pholoe baltica</i>	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
ANNELIDA	<i>Pholoe inornata</i>	0	0	0	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Podarkeopsis capensis</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Poecilochaetus serpens</i>	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Polycirrus</i>	0	0	0	0	3	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Polydora caeca (agg)</i>	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Polydora caulleryi</i>	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
ANNELIDA	<i>Polydora ciliata (Type A)</i>	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Polynoe scolopendrina</i>	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Pomatoceros lamarcki</i>	0	0	0	5976	8136	1	362	0	1	23	4	0	0	4	0	0	0	251	0	0
ANNELIDA	<i>Pomatoceros triqueter</i>	0	0	0	8	352	1	3	0	0	0	0	0	0	0	0	0	0	2	0	0
ANNELIDA	<i>Praxillella affinis</i>	2	0	0	0	0	0	0	0	0	0	4	0	0	3	0	0	0	0	0	0
ANNELIDA	<i>Protodorvillea kefersteini</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
ANNELIDA	<i>Psamathe fusca</i>	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Sabellaria alveolata</i>	0	0	0	0	0	419	5	0	0	1	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Sabellaria spinulosa</i>	0	0	0	0	4	40	17	0	0	4	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Sabellides octocirrata</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Scalibregma celticum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Scoloplos armiger</i>	2	3	0	0	0	0	0	0	0	1	6	0	0	4	0	0	0	0	0	0
ANNELIDA	<i>Serpulidae</i>	0	0	0	102	65	0	42	0	0	0	0	0	0	0	0	0	0	28	0	0
ANNELIDA	<i>Sphaerosyllis taylori</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Spio armata (agg)</i>	1	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3	1	0
ANNELIDA	<i>Spio martinensis</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
ANNELIDA	<i>Spiochaetopterus</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Spiophanes bombyx</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Spiophanes kroyeri</i>	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Sthenelais boa</i>	0	0	0	0	2	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0
ANNELIDA	<i>Syllides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Syllis</i>	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Syllis 'Species G'</i>	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ANNELIDA	<i>Syllis armillaris</i>	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	1	0	0
ANNELIDA	<i>Syllis variegata</i>	0	0	0	1	1	4	11	0	0	0	0	0	0	0	0	0	0	1	0	0
ANNELIDA	<i>Tharyx killariensis</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ANNELIDA	<i>Thelepus cincinnatus</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0
ANNELIDA	<i>Thelepus setosus</i>	0	0	0	4	15	0	0	0	0	1	0	0	0	0	0	0	0	9	0	0
ANNELIDA	<i>Travisia forbesii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
BRYOZOA	<i>Aetea truncata</i>	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Alcyonidium diaphanum</i>	P	0	0	0	0	P	0	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Alcyonidium mytili</i>	0	0	0	0	0	P	P	0	0	P	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Alcyonidium parasiticum</i>	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Amathia lendigera</i>	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
BRYOZOA	<i>Amphiblestrum auritum</i>	0	0	0	P	0	P	P	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Bicelliarella ciliata</i>	0	P	0	0	P	P	0	0	0	P	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Bugula avicularia</i>	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Cellepora pumicosa</i>	0	0	0	0	0	P	P	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Chorizopora brongiarti</i>	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Collarina balzaci</i>	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Conopeum reticulum</i>	P	P	P	P	0	P	P	0	P	0	0	P	0	P	0	0	0	0	P	0
BRYOZOA	<i>Cribrilinidae</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0
BRYOZOA	<i>Crisia</i>	0	P	0	0	P	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Disporella hispida</i>	0	P	0	0	P	0	0	0	0	P	P	0	0	P	P	0	0	0	0	0
BRYOZOA	<i>Electra monostachys</i>	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Electra pilosa</i>	P	0	0	P	P	P	P	0	P	P	0	0	0	0	0	0	0	P	0	0
BRYOZOA	<i>Entalophoroecia deflexa</i>	0	0	0	0	0	P	0	0	0	0	0	0	0	0	P	0	0	0	0	0
BRYOZOA	<i>Escharella immersa</i>	0	P	0	P	P	0	P	0	P	P	P	P	0	P	P	0	P	P	P	P
BRYOZOA	<i>Escharella labiosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0
BRYOZOA	<i>Escharella variolosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	P	P	0	0	0	0	0
BRYOZOA	<i>Escharella ventricosa</i>	0	P	0	0	P	P	0	0	0	P	P	0	0	P	0	0	0	P	0	0
BRYOZOA	<i>Escharina johnstoni</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0
BRYOZOA	<i>Eucratea loricata</i>	0	0	0	P	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0
BRYOZOA	<i>Eurystrotos compacta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0
BRYOZOA	<i>Fenestulina malusii</i>	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Flustra foliacea</i>	P	0	0	0	0	P	P	0	P	P	0	0	0	P	0	0	0	P	0	0
BRYOZOA	<i>Hippoporina pertusa</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Hippothoa divaricata</i>	0	0	0	0	P	0	0	0	0	0	0	0	0	P	0	0	0	P	0	0
BRYOZOA	<i>Microporella ciliata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0
BRYOZOA	<i>Plagioecia sarniensis</i>	0	P	0	0	P	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Porella concinna</i>	0	0	0	0	0	0	0	0	0	P	0	0	0	P	0	0	0	0	0	0
BRYOZOA	<i>Schizomavella auriculata</i>	0	0	0	0	P	P	0	0	0	P	P	0	0	P	P	0	0	P	0	0
BRYOZOA	<i>Schizomavella linearis</i>	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Scruparia ambigua</i>	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Scruparia chelata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0
BRYOZOA	<i>Scrupocellaria scruposa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0
BRYOZOA	<i>Tubulipora</i>	0	0	0	0	P	0	0	0	P	P	0	0	0	0	0	0	0	0	0	0
BRYOZOA	<i>Turbicellepora avicularis</i>	P	0	0	0	P	0	P	0	P	P	P	0	0	P	0	0	0	P	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
BRYOZOA	<i>Vesicularia spinosa</i>	P	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHELICERATA	<i>Nymphon brevirostre</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CILLIAPHORA	<i>Lagotia viridis</i>	0	P	0	0	P	0	P	0	P	0	0	0	0	0	P	0	0	0	0	0
CNIDARIA	<i>Abietinaria abietina</i>	0	0	0	P	P	0	0	0	0	P	0	0	0	0	0	0	0	P	0	0
CNIDARIA	ACTINIARIA	0	0	0	0	2	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
CNIDARIA	<i>Alcyonium digitatum</i>	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0
CNIDARIA	ATHECATA	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Bougainvilliidae</i>	P	0	0	P	0	P	0	0	0	P	0	0	0	P	0	0	0	0	0	0
CNIDARIA	<i>Calycella syringa</i>	P	0	0	0	0	0	0	0	0	P	P	0	0	P	0	0	0	0	0	0
CNIDARIA	<i>Campanularia volubilis</i>	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Campanulariidae</i>	P	0	0	P	0	0	0	0	P	0	0	0	0	P	0	0	0	P	0	0
CNIDARIA	<i>Clytia hemisphaerica</i>	0	0	0	P	P	0	0	0	0	P	P	0	0	P	0	0	0	P	0	0
CNIDARIA	<i>Coryne</i>	0	P	0	0	P	0	0	0	0	P	0	0	0	P	0	0	0	0	0	0
CNIDARIA	<i>Diphasia attenuata</i>	P	P	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Edwardsia claparedii</i>	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Eudendrium</i>	0	0	0	0	0	P	0	0	0	P	0	0	0	P	0	0	0	P	0	0
CNIDARIA	<i>Halecium</i>	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Hydrallmania falcata</i>	0	P	0	P	P	P	0	0	P	P	P	0	0	P	0	0	0	P	0	0
CNIDARIA	<i>Kirchenpaueria pinnata</i>	0	0	0	P	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Plumularia setacea</i>	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0
CNIDARIA	<i>Sertularella</i>	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Sertularia</i>	P	0	0	P	0	0	0	0	P	P	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Tamarisca tamarisca</i>	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0
CNIDARIA	<i>Tubularia sp.</i>	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	P	0	0
CRUSTACEA	<i>Ampelisca diadema</i>	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Ampelisca spinipes</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
CRUSTACEA	<i>Anthura gracilis</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
CRUSTACEA	<i>Balanus balanus</i>	0	0	0	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Balanus crenatus</i>	0	0	0	1	25	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Bathyporeia elegans</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
CRUSTACEA	<i>Bodotria scorpioides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
CRUSTACEA	<i>Crassikorophium bonnellii</i>	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Crassikorophium crassicorne</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Erichthonius (female)</i>	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
CRUSTACEA	<i>Erichthonius punctatus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Gammaropsis maculata</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Gnathia oxyuraea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Harpinia pectinata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
CRUSTACEA	<i>Hippolytidae (juv)</i>	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Hyas araneus (juv)</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Janira maculosa</i>	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Leptocheirus pectinatus</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Liljeborgia pallida</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Maera othonis</i>	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Maerella tenuimana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
CRUSTACEA	<i>Monocorophium sextonae</i>	0	0	0	2	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Nannonyx goesii</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Paguridae (juv)</i>	1	1	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Pagurus bernhardus</i>	0	0	0	1	3	3	0	0	0	2	1	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Parapleustes bicuspis</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Pariambus typicus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Pisidia longicornis</i>	0	0	0	0	3	126	1	0	0	1	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Stenothoe marina</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Stenothoe tergestinum</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Tritaeta gibbosa</i>	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	<i>Unciola crenatipalma</i>	0	0	0	0	0	15	7	0	1	0	0	0	0	0	0	0	0	1	0	0
CRUSTACEA	<i>Urothoe elegans</i>	0	2	0	1	10	2	2	0	0	0	0	0	0	1	0	0	0	23	0	0
CRUSTACEA	<i>Verruca stroemia</i>	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	1	0	0
ECHINODERMATA	<i>Acrocrida brachiata</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECHINODERMATA	<i>Amphipholis squamata</i>	0	0	0	0	0	4	0	0	5	0	0	0	0	0	0	0	0	1	0	0
ECHINODERMATA	<i>Amphiura filiformis</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECHINODERMATA	<i>Amphiuridae</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ECHINODERMATA	<i>ECHINOIDA (juv)</i>	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
ECHINODERMATA	<i>Ophiothrix fragilis</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
ECHINODERMATA	<i>Ophiura ophiura</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECHINODERMATA	<i>Pedicellina</i>	0	P	0	P	0	0	0	0	0	P	0	0	0	P	0	0	0	P	0	0
ECHINODERMATA	<i>Psammechinus miliaris</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	0	0
ECHINODERMATA	<i>Psammechinus miliaris (juv)</i>	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
MOLLUSCA	<i>Abra alba</i>	8	0	0	0	0	3	0	0	0	2	1	0	0	1	0	0	0	1	0	0
MOLLUSCA	<i>Abra prismatica</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
MOLLUSCA	<i>Acanthochitona crinitus</i>	0	0	0	0	1	0	1	0	0	2	0	0	0	1	0	0	0	0	0	0
MOLLUSCA	<i>Anomiidae (juv)</i>	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	2	0	0
MOLLUSCA	<i>Buccinum undatum</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Chrysalida interstincta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
MOLLUSCA	<i>Diodora graeca</i>	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Doto</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
MOLLUSCA	<i>Gari tellinella</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Hiatella arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
MOLLUSCA	<i>Lamellaria perspicua</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Leptochiton asellus</i>	0	1	0	5	9	0	5	0	2	56	13	0	0	11	0	0	0	15	0	0
MOLLUSCA	<i>Limacia clavigera</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Modiolarca tumida</i>	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Modiolus (juv)</i>	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Modiolus modiolus</i>	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Modiolus modiolus (juv)</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Musculus discors</i>	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Mya truncate (juv)</i>	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
MOLLUSCA	<i>Mysella bidentata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
MOLLUSCA	<i>Mytilus edulis</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Nucula nucleus</i>	0	0	0	9	246	7	25	0	1	0	0	0	0	0	0	0	0	185	0	0
MOLLUSCA	<i>NUDIBRANCHIA (eggs)</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0
MOLLUSCA	<i>Oenopota rufa</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Pallium tigrinum</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Pododesmus patelliformis</i>	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
MOLLUSCA	<i>Sphenia binghami</i>	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA	<i>Spisula solida</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
MOLLUSCA	<i>Timoclea ovata</i>	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
NEMATODA	<i>Nematoda spp.</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEMERTEA	<i>Nemertea spp.</i>	0	4	0	0	1	1	2	0	1	2	0	0	0	6	1	0	0	4	0	0
PHORONIDA	<i>Phoronis</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
PORIFERA	<i>Clyona</i>	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0
PORIFERA	<i>Leucosolenia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0

		D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
PORIFERA	<i>Porifera Indet.</i>	0	0	0	0	P	0	P	0	0	P	0	0	0	0	0	0	0	0	0	0
PORIFERA	<i>Scypha ciliata</i>	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RHODOPHYTA	<i>Corallinaceae</i>	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0
SIPUNCULA	<i>Golfingia elongata</i>	0	2	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
SIPUNCULA	<i>Golfingia vulgaris</i>	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	P	0	0
SIPUNCULA	<i>Nephasoma minutum</i>	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIPUNCULA	<i>Phascolion strombus</i>	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
TUNICATA	<i>ASCIDIACEA (juv)</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>ASCIDIACEA (larva)</i>	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Asciidiella</i>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Asciidiella scabra</i>	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Asciidiidae</i>	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Dendrodoa grossularia</i>	0	5	0	14	30	0	42	0	0	47	1	0	0	6	0	0	0	5	0	0
TUNICATA	<i>Didemnidae</i>	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Molgula sp.</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Polycarpa fibrosa</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUNICATA	<i>Polycarpa pomaria</i>	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Total number of Taxa (May 2007)</i>		40	45	2	44	83	73	51	1	31	55	38	2	5	74	13	1	1	67	13	4
<i>Total number of Individuals (May 2007)</i>		50	71	1	6158	9061	796	573	0	25	169	74	0	5	169	5	1	0	594	45	3
<i>Total number of Taxa (June 2006)</i>		39	56	11	94	131	17	102	0	94	83	64	2	8	128	5	1	2	116	4	4
<i>Total number of Individuals (June 2006)</i>		68	179	8	12896	4531	347	1433	0	1159	374	200	2	9	742	13	1	3	2793	17	4
<i>Total number of Taxa (June 2005)</i>		95	38	6	121	155	128	129	8	96	117	108	7	19	125	13	9	5	167	13	15
<i>Total number of Individuals (June 2005)</i>		816	67	1	7872	7806	9669	1887	2	590	897	2216	1	12	1584	39	5	1	16324	8	14
<i>Total number of Taxa (Oct 2004)</i>		74	40	9	102	113	106	76	1	70	116	99	4	4	115	3	5	3	125	7	5
<i>Total number of Individuals (Oct 2004)</i>		450	101	21	5154	2126	3919	3247	1	1818	1176	4071	6	7	998	3	10	3	8972	9	5

Appendix 6.6 Particle Size Analysis Results May 2007.

Site Code	4mm	2mm	1mm	0.5mm	0.25mm	0.125mm	0.063mm	<0.063mm	Mean phi	skewness	kurtosis	Classification after Buchanan	Folk Triangles after BGS
D01	0.4	1.5	2.3	6.8	50.5	33.4	1.1	3.9	2.09	0.281	1.145	Moderately Sorted Fine Sand	Slightly Gravelly Sand
D02	2.9	4.6	5.4	7.6	41.7	32.7	1.4	3.6	1.79	-0.198	1.726	Poorly Sorted Medium Sand	Gravelly Sand
D03	1.6	1.0	0.2	0.3	57.8	36.8	0.1	2.2	2.11	0.480	0.601	Moderately Well Sorted Fine Sand	Slightly Gravelly Sand
D04	69.6	14.8	5.4	2.9	5.9	1.0	0.2	0.2	-1.84	0.750	1.692	Moderately Sorted Very Fine Gravel	Gravel
D05	58.2	13.6	5.3	3.7	5.3	11.8	0.6	1.4	-0.88	0.861	1.045	Poorly Sorted Very Coarse Sand	Sandy Gravel
D06	1.6	1.0	2.8	25.8	55.7	7.8	1.5	3.8	1.45	-0.235	1.464	Moderately Sorted Medium Sand	Slightly Gravelly Sand
D07	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	Gravel (Visual Assessment Only)	Gravel
D08	0.0	0.9	1.6	7.6	82.4	5.1	0.0	2.4	1.74	-0.021	2.770	Well Sorted Medium Sand	Slightly Gravelly Sand
D09	11.5	8.5	7.0	11.7	44.1	12.4	1.1	3.6	0.97	-0.501	1.051	Poorly Sorted Coarse Sand	Gravelly Sand
D10	98.8	0.7	0.0	0.0	0.0	0.2	0.0	0.3	-2.24	0.000	0.738	Very Well Sorted Fine Gravel	Grave
D11	41.7	8.1	2.8	3.7	31.5	0.0	0.0	12.2	-0.27	0.339	0.902	Very Poorly Sorted Very Coarse Sand	Muddy Sandy Gravel
D12	0.0	0.0	0.0	0.3	80.3	17.6	0.1	1.6	1.99	0.576	1.793	Well Sorted Medium Sand	Sand
D13	0.0	0.2	0.6	6.0	81.6	8.5	0.5	2.6	1.76	0.050	2.693	Well Sorted Medium Sand	Slightly Gravelly Sand
D14	12.0	8.3	5.3	10.9	22.5	32.3	3.3	5.4	1.14	-0.356	0.969	Very Poorly Sorted Medium Sand	Gravelly Sand
D15	16.2	4.9	4.3	6.4	60.1	5.8	0.1	2.2	0.52	-0.709	1.098	Poorly Sorted Coarse Sand	Gravelly Sand
D16	1.0	0.6	0.8	2.2	78.8	13.6	0.1	2.8	1.95	0.562	1.819	Well Sorted Medium Sand	Slightly Gravelly Sand
D17	3.2	2.6	7.4	29.9	50.2	4.0	0.0	2.6	1.34	-0.457	1.405	Moderately Sorted Medium Sand	Gravelly Sand
D18	84.0	7.9	2.1	1.0	2.5	2.1	0.2	0.2	-2.20	0.434	5.605	Moderately Well Sorted Fine Gravel	Gravel
D19	3.8	0.3	0.4	1.0	75.6	15.2	0.4	3.3	1.98	0.293	2.745	Moderately Well Sorted Medium Sand	Slightly Gravelly Sand
D20	12.2	9.7	9.0	6.3	55.4	5.2	0.0	2.2	0.75	-0.683	0.949	Poorly Sorted Coarse Sand	Gravelly Sand