AQUA-FACT

A survey of selected littoral and sublittoral sites in Clew Bay, Co. Mayo.

For: Dúchas
Ely Place
Dublin

Compiled by: Aqua-Fact International Services Limited
12, Kilkerrin Park,
Liosbaun,
Galway.

December 1999.

TABLE OF CONTENTS

Introduction

Dúchas contracted Aqua-Fact International Services to carry out biological surveys of particular sites in Clew Bay Co. Mayo. These included 12 sublittoral and 4 littoral locations which had been selected in consultation with Dr. E. Sides of Dúchas. The surveys were required to of a BioMar-type survey with the same methods as used in BioMar being adopted here. These survey methods are described in detail by Hiscock (1996) and recording forms similar to those used in the BioMar survey were supplied by Dúchas. This work was required as part of a programme by Dúchas to provide additional biological and physical information on proposed marine Special Areas of Conservation.

The brief supplied by Dúchas provided a description of the details of the littoral and sublittoral field work and these are outlined below.

Littoral

Each littoral site is divided into three habitats : strandline, midshore and lowshore and the sediment is to be cored. Rocky shores are divided into their biological zones e.g. lichens, *Pelvetia canaliculata*, *Fucus vesiculosus* and *Fucus serratus* zones etc. and each zone identified should be examined for its constituent flora and fauna. Where possible, identification should be done on site while material for later identification should be preserved in labelled containers.

Sublittoral

For each of the selected sites, the area should be examined briefly and divided into its constituent subhabitats e.g. a pebble/gravel slope which grades into a muddy plain would represent two habitats and a species list for each should be compiled.

For each habitat the following should be achieved :

- recording of macroflora and fauna to species level (*in situ*/ collected material)

- coring for infaunal species where appropriate (1 mm mesh to be used when washing sediment)

- underwater photographic record

- where appropriate coring for sediment samples should be carried out.

The final report is to include a listing of the sites sampled with latitude and longitude, name of recorders, date, sampling method e.g. general observations, coring, photography, granulometry. The site locations are to be shown on an Admiralty Chart with their appropriate code number. Where possible the site is to be assigned to a biotope using the BioMar Biotope Classification with a comment on the goodness of fit. The final report should also have a spreadsheet of the different biotopes with site code, a matrix of species by habitat of each site, a summary of the findings of the survey, species or habitats which are of interest should be highlighted and a listing of taxonomic experts used for identification of material should be included.

Nomenclature follows Howsen and Picton (1997) and identification is based on a broad range of literature which are presented in the reference section.

Site description

The area in the eastern portion on Inner Clew Bay is quite unique in Irish marine waters with landscape being dominated by the numerous drumlins (ca 100) which extend westwards some 10 km into the body of the bay. There are many promontories that similarly extend a number of kilomteres westwards at the eastern extremity of the bay. These glacial deposits can be quite extensive e.g. Collanmore and Islandmore and some have either full-time dwellings or summer residents. All islands that are large enough to support some level of pastureland, are used by local farmers for grazing. This complex of islands gives rise to a patchwork of shallow straits and lagoons connected by deeper channels and this varied topography, which creates a very variable current regime, allows for a heterogeneous assemblage of substrate types varying from stones, maerl, coarse sands, shelly sands, sandy muds and muds. The stony areas represent areas where larger portions of glacial debris from collapsed sections of the drumlins have accumulated.

Historically, Clew Bay was an area of relatively high local shipping activity the sea being the main route whereby goods were moved around the adjacent coastal communities. The presence of the lighthouse on Inishgort is testament to such times. However, there is virtually no commercial shipping activity in the bay now. Virtually all the non-leisure vessels are associated with commercial fishing and aquaculture.

Clew Bay is renowned in marine biological terms because of the exhaustive survey of Clare Island masterminded by Robert Lloyd Praeger in the later part of the first decade and the early part of the second decade of the 20th century. The marine ecology volume of this report was written by Rowland Southern (Southern, 1915) and represents the first truly ecological approach to describing a location in Irish waters in terms of its ecology. This section of the survey includes data from within the inner part of Clew Bay. No other published information on the marine ecology of the littoral and sublittoral habitats of Clew Bay has been found to date.

Clew Bay is also the type locality for a number of polychaete species described during the Clare Island survey by Southern (1914).

Many terns (Arctic/Common, Sandwich), peregrine falcons and seals were seen during the sampling periods.

The water within the islands at the eastern end of Clew Bay is only stratified close to the main sources of freshwater. These are shown in Figure 2 and are located at Westport and Newport. Salinities are therefore generally high throughout the area at ca 34 S. Given the relatively shallow depths and the tidal conditions, residence time of the water within the eastern end of the bay is likely to be short e.g. 2 days.

Results

Littoral

Four littoral locations were sampled in Clew Bay at the end of August, 1999. Sampling was carried out at Spring tide conditions and weather was generally fine during the sampling period. The site locations are shown in Figure 1. The following site descriptions are based on field observations and are supplemented by the BioMar record sheets and the metadata presented in Table 1. Comparisons with Hiscock (1996) and Connor *et al.* (1996) are made. Species data are presented in Appendix I.

Shore 1. Murrisk.

This shore is due north of a headland on the road from Westport to Louisburg and lies in the shadow of Croagh Patrick. Access to the shore is easy and the road is used by oyster farmers who have extensive areas of the upper sandy shore under culture. The top ca. 15m of the shore is composed of rocks and stones which are covered by fucoid algae. This stony shore gives way to an expansive area of muddy and fine sands which extends

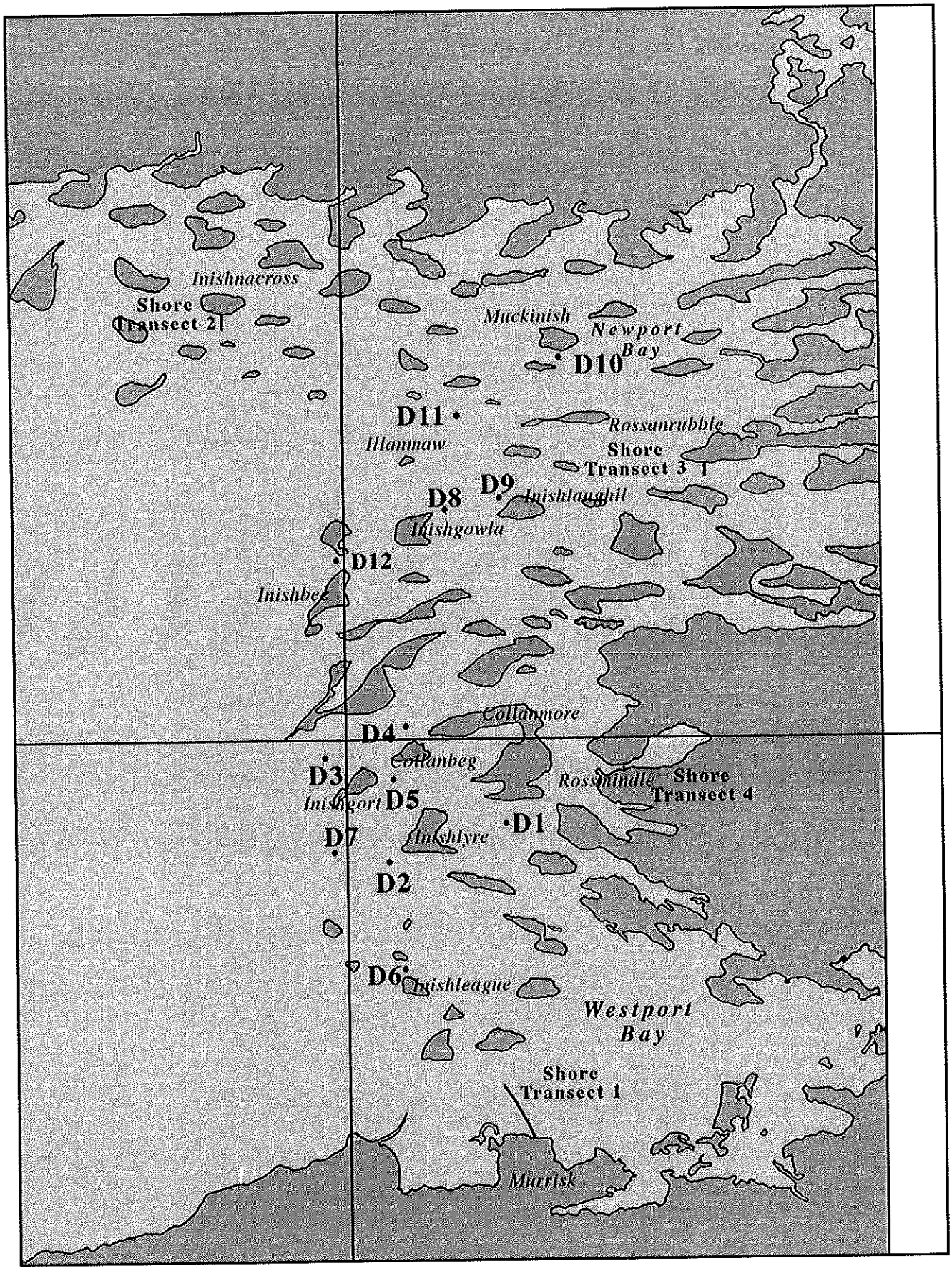

Figure 1. Outline of Clew Bay showing location of Dive (D1-12) and Transect Sampling Sites

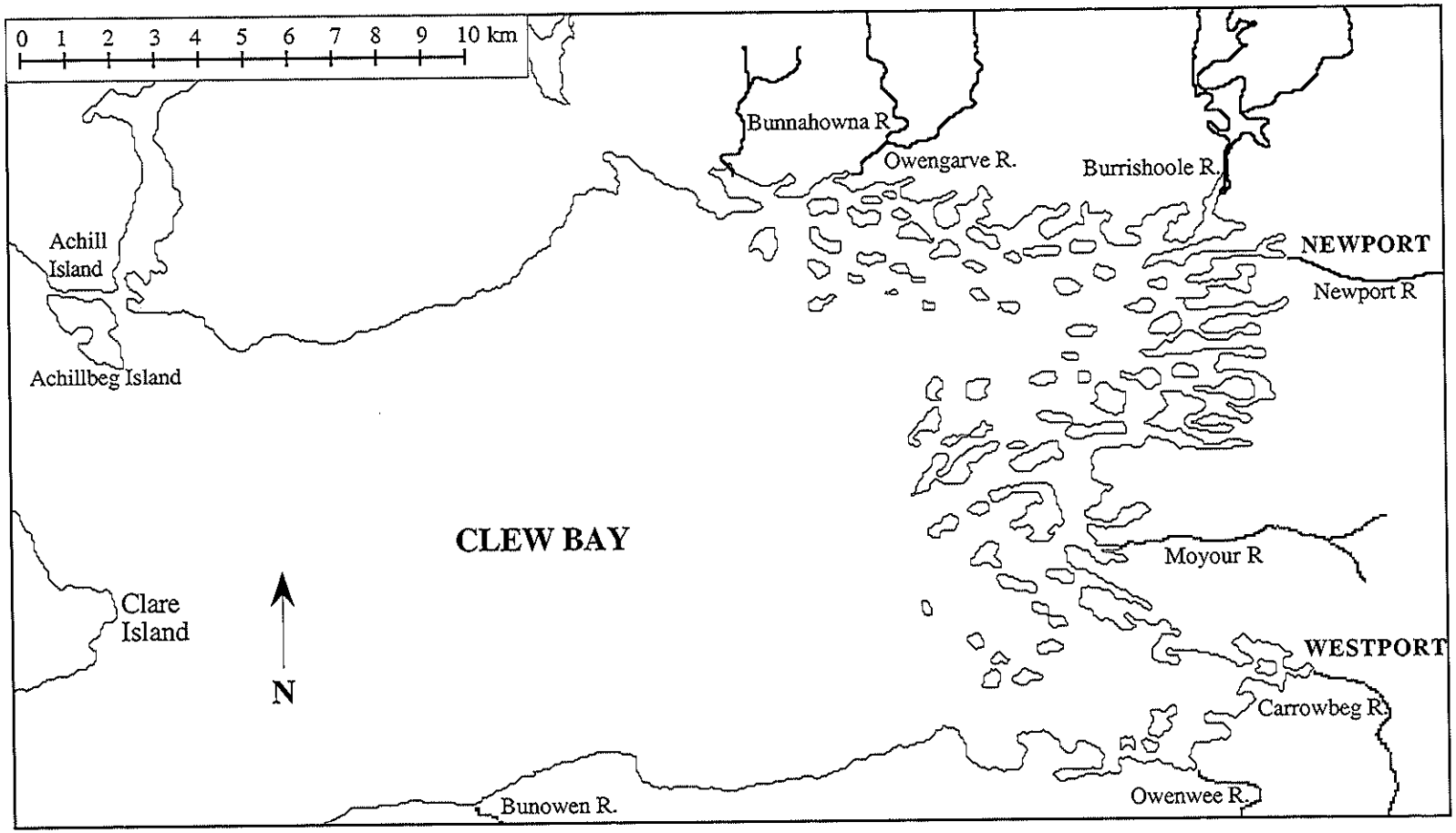

Figure 2. Location of rivers in Clew Bay.

ca 1 km to low water. The upper part of the sandy area does not completely drain at low water and remains covered in water (ca 5 cm deep).

Parts of the upper shore equate with the yellow and grey lichen (SUR.YG) and *Verrucaria* - type shores and the *Pelvetia/Fucus/Ascophyllum* (SLR.Pel, SLR.Fspi, SLR.Asc, SLR.Fser) in Connor *et al.* (1996) while the lower shore is similar to clean sandy shores with *Arenicola* (EGS.AP).

Shore 2. South of Inishnacross.

This shore is located to the south of the main Newport - Achill road. Access is relatively difficult as a walk of ca 1 km across muddy sands, sands and tidal creeks is required to reach the island of Inishnacross. As for Murrisk, there is extensive oyster culturing in the general area and the farmers have a small shore base for processing oysters when they are taken ashore for sale. The substrate at the area where the samples were taken varies from a stony upper section, which as for Murrisk, gives way to sands.

The upper shore is similar to the *Pelvetia/Fucus/Ascophyllum* (SLR.Pel, SLR.Fspi, SLR.Asc, SLR.Fser) of Connor *et al.* (1996) while the lower shore is more like their tide-scoured lower shore (EGS.Lan).

Shore 3. South of Rossnarubble.

Rossnarubble is one of the long promontories mentioned in the general site description. It extends westwards into the eastern part of Clew Bay. A tarred road is present over much of the headland and this eventually gives way to a farm track. The shore is relatively short and is composed of stones that presumably represent the remains of the glacial till of which the drumlins are composed.

This shore is similar to the *Pelvetia/Fucus/Ascophyllym* (SLR.Pel, SLR.Fspi, SLR.Asc, SLR.Fser) of Connor *et al.* (1996).

Shore 4. Rossmindle

This shore lies between Rossmindle and Roscahill on the southern shoreline. It is in a narrows which drains an area marked as Castleaffy Strand in the Ordanance Survey map number 31 (1:50,000). This map shows a small track crossing the narrows - this does not exist. Access to the shore is easy and the narrows is used as an anchorage for a number of small fishing and pleasure boats. The shore is composed of stones and is dominated by brown algae.

This shore is like the *Pelvetia/Fucus/Ascophyllym* (SLR.Pel, SLR.Fspi, SLR.Asc, SLR.Fser) of Connor *et al.* (1996).

Littroral sites

Shore 1. 28.VIII.99
Location : Murrisk, Clew Bay
Conditions : Calm, sunny.
Team members : B.O'Connor, E.Sides and C. Ryan.
Time : 11.30
Lat : 53° 47'.17 Long. : 09° 37'.49
Bottom types : Boulders and stones in upper shore giving way to muddy sands at mid shore and fine sands at low shore.
Samples : Photographs, cores, field notes.

Shore 2. 29.VIII.99
Location : Tiranaur, North Clew Bay
Conditions : Calm, sunny.
Team members : B.O'Connor and C. Ryan.
Time : 12.30
Lat : 53° 52'.96 Long. : 09° 41'.24
Bottom types : Stones in upper shore, sand at mid shore and low shore.
Samples : Photographs, cores, field notes.

Shore 2. 29.VIII.99
Location : Tiranaur, North Clew Bay
Conditions : Calm, sunny.
Team members : B.O'Connor and C. Ryan.
Time : 12.30
Lat : 53° 52'.96 Long. : 09° 41'.24
Bottom types : Stones in upper shore, sand at mid shore and low shore.
Samples : Photographs, cores, field notes.

Shore 3. 29.VIII.99
Location : Rossnarubble, central Clew Bay
Conditions : Calm, sunny.
Team members : B.O'Connor and C. Ryan.
Time : 13.00
Lat : 53° 51'.91 Long. : 09° 35'.07
Bottom types : Stony shore.
Samples : Photographs, cores, field notes.

Shore 4. 29.VIII.99
Location : Rossmindle, central Clew Bay
Conditions : Calm, sunny.
Team members : B.O'Connor and C. Ryan.
Time : 14.00
Lat : 53° 49'.50 Long. : 09° 36'.48
Bottom types : Stony shore.
Samples : Photographs, cores, field notes.

Table 1. Metadata of littoral sites sampled in August 1999, Clew Bay.

Table 2 below, presents the results of the granulometric analyses carried out on the sediment samples collected at the littoral sampling sites.

	<63µ	63-250µ	250-1000µ	>1000µ
Murrisk mid	2.2	74.8	22.7	0.4
Murrisk low	1.7	69.8	28.1	0.4
Inishnacross mid	21.4	72.1	5.7	0.8
Inishnacross low	3.4	62.8	32.1	1.5

Table 2. Sediment data from two shores in Clew Bay, Co. Mayo sampled in August 1999. All figures as percentages of the total sample.

The mid shore sample collected at Inishnacross had the greatest amount of mud i.e. 21.4% in comparison to the other three sites. The two sediment samples from Murrisk and the lower shore sample from Inishnacross were all very similar to one another with the fine sand portion of the sample comprising the greatest percentage.

Sublittoral

Sublittoral survey work was carried out on August 18 and 19 and weather for the most part was reasonably good. This period was chosen as it was during Neap tides and tidal currents would be at their weakest making it most suitable for diving. There were

some rain showers and lightening on the 18th and the wind on the following day was ca Force 4 but given the shelter afforded by the numerous islands in the area, sea conditions were calm. Six sites were sampled on each day with the southern portion of the bay being surveyed on the 18th and the northern part on the 19th. The location of each of the 12 sites sampled is shown on Figure 1 and Table 1 lists the sites with their latitudes and longitudes along with other metadata required in the study brief. The site location map is a copy of the Admiralty Chart map no. 1984 that contours depths to low water springs. The extensive network of fringing cobble banks along the outer islands is therefore not readily evident from this map. During the two-day sampling the cobble banks were continuous between for example Inishgort and Islandmore and there was an extensive cobble reef from south of Dorinish Beg north towards Inishgort. These banks provide substantial shelter to the inner areas of this part of Clew Bay.

The following subtidal site descriptions are based on direct observations by divers and these are supplemented by the metadata presented in Table 3 and BioMar record sheets which accompany this report. The station locations are presented in Figure 1. The faunal data from the cores and additional information collated from the underwater photographs are provided in Appendix II while the quantitative granulometric data are provided in Table 4. Comparisons with Hiscock (1996) and Connor *et al.* (1996) are made.

Station 1. Due south of Collenmore.

Water depth at Station was 10m. The bottom was generally level with rolling mounds of live maerl interspersed with accumulations of floating weed debris. The bottom consisted of medium sands with dead maerl debris, oyster shell, some rocky outcrops and some stones. The macrofauna appeared diverse. A number of lobsters (3) were seen

moving over open ground without the protection of rocky outcrops. The bottom conditions were indicative of good flushing conditions and relatively strong currents.

This habitat is like the maerl beds in infralittoral clean gravels (IGS.Phy) or the maerl beds in infralittoral muddy gravels (IMX.Lcor) of Connor *et al.* (1997). O'Connor *et al.* (1997) describe a number of different types of maerl associations present with the greater Galway Bay area. It would appear that Connor *et al* (1997) needs some modification.

Station 2. South of Inishlyre

The bottom at this location was generally level with a depth of 6m. Although there was some live maerl in this area, the bottom generally consisted of an even mixture of medium sands, dead maerl and shells. The most striking features of this bottom was the density of live and dead Ensis spp. Currents are probably relatively strong.

This equates to one of Connor *et al.* (1997) infralittoral sand or gravel habitats (IGS).

Station 3. Northwest of Inishlyre.

Station 3 was also shallow at ca 6m in depth. The bottom was muddy sand and some rocky outcrops were evident with sponge and epifaunal attachments dominant. Hermit crabs were common on the seabed and there were numerous dead mollusc shells. As black mud was frequently noted at the surface of this location, it is surmised that redox depths are relatively shallow in this area. Currents are probably relatively weak in this area.

This does not equate with any habitat given by Connor *et al.* (1997).

Station 4. North west of Collenbeg.

This was the shallowest dive of the survey at only 4m. The bottom substrate was muddy sand with some maerl overlain by *Ulva* and brown weed. A number of crab species were seen at this site. Current speeds are likely to be low at this site.

This does not equate with any habitat given by Connor *et al.* (1997).

Station 5. Northeast of Inishgort.

Station 5 was at the outside of an entrance to a semi-enclosed area. A muddy-sand bottom sloped unevenly up and down as depths varied between 8 and 10m. Habitat type did not change during the dive. There was little algal cover. Currents are probably relatively weak as evidence by depositional areas.

This does not equate with any habitat given by Connor *et al.* (1997).

Station 6. In straits between Inishleague and Inishimmel.

Station 6 is situated between two close islands and experiences strong currents. The depth ranges from the shallows at the islands to 6-7m in the central channel area. The bottom is predominantly rocky with boulders and intermittent coarse sandy/gravely patches. The habitat is typical of a high energy, rocky site experiencing strong currents with an abundance of weed cover and suspension feeding epifauna. At the end of the dive, towards the shore of the island to the north of this site, a small *Zostra* bed which was out of the main channel of water flow was noted. It was not sampled.

This is similar to one of Connor *et al* . (1997) infralittoral rock communities e.g. MIR or SIR.

Station 7. Southwest of Inishgort Light.

Station 7 lay to the windward of the island clusters in Clew Bay. The depth at this location was relatively deep and ranged in depth from 15 to 20m. The bottom at this location consisted of long furrows of broken shell, dead maerl and sandy gravel interspersed with sands and accumulated free floating weeds. At frequent intervals there were large accumulations of large oyster and razor shells and in some furrows mud's had accumulated. The dive began at a 20 meter depth, moved 300m in a north west direction and ended in 15m of water. There was little change in the habitat over this distance.

This equates to one of Connor *et al.* (1997) infralittoral sand or gravel habitats (IGS)

Station 8. North of Inishgowla.

This site had muddy coarse sand with rugged rocks of various shapes and sizes scattered throughout the area. These rocks were covered with *Nemertesia* sp., sponges, ascidians and other epifauna and also provided shelter for species such as *Palemon serratus* and *Liocarcinus puber*. Habitat type did not change during the dive. Depth varied from circa 12m at the beginning of the dive to circa 16m at the end. Species composition was diverse and numerous with a combination of epibenthic and mobile macrofauna present.

This habitat is similar to one of Connor *et al.* (1997) circalittoral rocky habitats e.g. MCR or SCR.

Station 9 Northwest of Inishlaughil.

Station 9 consisted of a muddy bottom and varied in depth from about 9m to a depth of 15m over a short distance. The water in this area had a high level of suspended material, a factor that reduced visibility considerably near the bottom. The soft mud bottom had frequent accumulations of free floating weed and from the evidence of burrowing polychaete mounds and dark surface muds, it would appear that redox values in this area are quite shallow. *Calliostoma* and the large number of *Turritella* shells are strewn over the bottom and in many cases are occupied by hermit crabs. The bottom through this dive was consistent and showed little variation in either bottom sediments or faunal composition.

This station is similar to Connor *et al.* (1997) *Amphiura filiformis* habitat (CGS. AfiliEcor). However, the main characterising species i.e. *Amphiura filiformis* and *Echinocardium cordatum* were not recorded.

Station 10. Southeast of Muckininsh.

Three habitats were recorded during the dive that sloped progressively from 4m near the shore to approximately 13m in the centre of a wide channel.

Habitat 1: relatively flat bottom composed of coarse sand-shell with mud.

Habitat 2: steep sloping bottom of small smooth pebbles with some mud.

Habitat 3: flat bottom of soft mud. Redox close to the surface with small patches of *Beggiatoa* sp.

The first habitat is similar to one of Connor *et al.* (1997) infralittoral rock communities e.g. EIR while the second is not immediately referable to any particular habitat listed by

these authors. The third is probably the same as their *Beggiatoa* on anoxic muds (CMU.Beg).

Station 11. North of Illaunmaw.

Station 11 is the furthest northwesterly station in this study. Water depth was consistently 12m throughout the dive overlying a soft muddy bottom. As with Station 9 the water at this site had a high suspended sediment load. Over the length of the dive the bottom was predominantly soft mud with interspersed shell debris. The bottom topography changed little with the exception of the slight elevation of the Norwegian lobster (*Nephrops*) burrowing mounds.

This is like Connor *et al.* (1997) Sea pens, *Nephrops* etc habitat (CMU.SpNep) but without the sea pens.

Station 12. In straits between Inishoo and Inishbee.

A clean sand bottom in approximately 15 meters of water. Depth varied between 10 and 13m. There was little weed cover although some drift alga (*Laminaria*) was observed. The bottom was indicative of a high-energy site that experiences strong tidal currents between the two islands.

This habitat is probably the same as one of Connor *et al.* (1997) infralittoral sand or gravel habitats (IGS).

Sublittoral sites Dive 1. 18.VIII.99 Location : Due S Collanmore, Clew Bay Conditions : NW 3, small waves, sunny. Approx. depth : 10 m

Divers : J. Costelloe and F. White
Time in : 12.50
Time out : 13.40
Lat : 53° 49'.46 Long. : 09° 37'.99
Bottom type : Flat maerl bed.
Samples : Video, stills, cores, field notes.

Dive 2. 18.VIII.99
Location : S of Inishlyre, Clew Bay
Conditions : NW 3, calm, sunny.
Approx. depth : 6 m
Divers : J. Costelloe, M. Costelloe and F. White
Time in : 14.05
Time out : 14.45
Lat : 53° 49'.00 Long. : 09° 39'.55
Bottom type : Dead maerl and sand with many dead shells.
Samples : Video, stills, cores, field notes.

Dive 3. 18.VIII.99
Location : NW Inishgort, Clew Bay
Conditions : NW 3, calm, sunny.
Approx. depth : 6 m
Divers : J. Costelloe and M. Costelloe
Time in : 15.15
Time out : 15.50
Lat : 53° 49'.89 Long. : 09° 40'.30
Bottom type : Muddy sand.
Samples : Video, stills, cores, field notes.

Dive 4. 18.VIII.99
Location : NW Collenbeg, Clew Bay
Conditions : NW 2, calm, sunny.
Approx. depth : 4m
Divers : M. Costelloe and G.O'Donohoe
Time in : 16.15
Time out : 16.40
Lat : 53° 50'.13 Long. : 09° 39'.52
Bottom type : Muddy bottom with maerl and Ulva.
Samples : Video, stills, cores, field notes.

Dive 5. 18.VIII.99
Location : SE Inishgort, Clew Bay
Conditions : Calm, sunny.
Approx. depth : 8 - 10 m
Divers : M. Costelloe and G.O'Donohoe
Time in : 16.50
Time out : 17.30
Lat : 53° 49'.73 Long. : 09° 39'.52
Bottom type : Muddy sand.
Samples : Video, stills, cores, field notes.

Dive 6. 18.VIII.99
Location : N Inishleague, Clew Bay
Conditions : Heavy showers, lightening storm.
Approx. depth : 7 m
Divers : J. Costelloe and G. O'Donohoe

Time in : 17.45
Time out : 18.15
Lat : 53° 48'.46 Long. : 09° 39'.55
Bottom type : Rocky.
Samples : Video, stills, field notes.

Dive 7. 19.VIII.99
Location : SW Inishgort Light, Clew Bay
Conditions : NE 4.
Approx. depth : 15 - 20 m
Divers : J. Costelloe and G. O'Donohoe
Time in : 10.10
Time out : 10.30
Lat : 53° 49'.51 Long. : 09° 39'.77
Bottom type : Shelly sand.
Samples : Video, stills, cores, field notes.

Dive 8. 19.VIII.99
Location : N of Inish Gowla, Clew Bay
Conditions : NE 4.
Approx. depth : 12 - 16 m
Divers : M. Costelloe, L. Sides and G. O'Donohoe
Time in : 11.15
Time out : 10.45
Lat : 53° 51'.66 Long. : 09° 39'.51
Bottom type : Rock with muddy coarse sand.
Samples : Video, stills, cores, field notes.

Dive 9. 19.VIII.99
Location : NW of Inishlaughil, Clew Bay
Conditions : NE 4.
Approx. depth : 9 -15 m
Divers : M. Costelloe, F. White and J.Costelloe
Time in : 12.45
Time out : 13.20
Lat : 53° 51'.70 Long. : 09° 38'.47
Bottom type : Soft mud
Samples : Video, stills, cores, field notes.

Dive 10. 19.VIII.99
Location : SE of Muckinish, Clew Bay
Conditions : NE 4.
Approx. depth : 4 - 13 m
Divers : M. Costelloe. L. Sides and G. O'Donohoe
Time in : 14.00
Time out : 14.45
Lat : 53° 52'.59 Long. : 09° 37'.48
Bottom type : Weed covered rocks in shallows, muddy deeper.
Samples : Video, stills, cores, field notes.

Dive 11. 19.VIII.99
Location : N of Illaunmaw, Clew Bay
Conditions : NE 3.
Approx. depth : 12 m
Divers : J. Costelloe.
Time in : 15.05

Time out : 15.45
Lat : 53° 52'.11 Long. : 09° 39'.22
Bottom type : Muddy sand
Samples : Video, stills, cores, field notes.

Dive 12. 19.VIII.99
Location : S of Inishnoo, Clew Bay
Conditions : NE 3.
Approx. depth : 15.4 m
Divers : M. Costelloe, L.Sides and G. O'Donohoe.
Time in : 16.05
Time out : 16.45
Lat : 53° 51'.27 Long. : 09° 40'.08
Bottom type : Clean sand
Samples : Video, stills, cores, field notes.

Table 3. Metadata of the 12 sublittoral sites sampled in August 1999, Clew Bay.

	< 63 µ	63-250µ	250-1000µ	>1000µ
D2	22.6	46.3	26.9	4.2
D3	33.1	40.2	17.2	9.8
D4	79.2	19.1	1.7	0
D5	18.4	60.4	9	12.1
D7	2.12	19.3	65.3	12.3
D8	24.6	1.2	25.6	48.7
D9	90.8	4	5.3	0
D10	11.6	2.7	65.2	20.6
D11	6.4	63.4	28	2.4
D12	3.6	61	33.9	1.4

Table 4. Granulometric analyses from 10 subtidal samples collected in Clew Bay, August 1999. No sediment samples were collected at Stations 1 and 6.

From the above table it can be seen that stations D9 and D4 had the greatest amounts of mud of all the locations sampled. The sediment sample collected at D9 came from the deepest part of the location where the *Beggiatoa* was observed. The samples which had the least amounts of mud were D7, D12 and D 11, the first two samples coming from the western part of the study area and were located closest to open water conditions. Station D8 had the greatest percentage of coarse sand (48.7%) while Stations D4 and D9 had no coarse sand fraction at all.

Conclusions

Given the highly complex nature of islands, headlands, narrows, deeps and shallow bays, it is quite understandable that as a marine area, Clew Bay is highly diverse in terms of habitats. However, 4 littoral and 12 sublittoral sites is too small a number of locations to characterise the entire area which encompasses some 70 square kilometers. The littoral sites examined showed some intra site similarities (see below) while the 12 sublittoral locations were quite dissimilar to one another. If a proper and full appreciation of the range of habitats and species is to be achieved, another method of surveying may be required i.e. a towed diver with a diver-to-vessel communications system, to increase the speed at which the sea bed can be adequately mapped and imaged. It would then be possible to be more selective in choosing sites for qualitative coring.

In terms of selecting sites which appear to be of interest, a number of criteria have been chosen in order to be able to objectively identify such sites. These include diversity of habitats within a site, whether these habitats are listed in the EU Habitats Directive, the number of species and the presence of species listed in both the same EU Directive and in the Birds Directive. The number of listed habitats and the extensive list of marine invertebrate species recorded during the course of this initial, cursory examination of a small set of sites clearly shows that the inner part of Clew Bay is high in conservation status. Many species that are recorded in this survey are not listed in the BioMar data sets and these are marked as "Not listed" in Appendix II. The results of this present survey also indicate that species diversity at many of the sites, both intertidal and subtidal is high in comparison to other intertidal and shallow subtidal bays in Irish coastal waters. Using the Birds Directive alone, a case could be made that due to the presence of terns, seals and peregrine falcons, the entire area could be regarded as requiring special conservation status.

With regard to the littoral sites, shores 1 and 2 were more similar to one another while shores 3 and 4 were different to one another with shore 4 probably being of least interest. Shores 1 and 2 are of importance due to the fact that they support are variety of bird species both resident and migratory species (summer and winter). Additionally, the presence of a distinct upper shore zone that was characterised by archiannelids is noteworthy. Shores 3 and 4 are not significant in terms of importance for migratory birds. However, due to the greater amount of microhabitats in boulder shores, they are of interest in terms of a far greater diversity than would be found on sandy shores. As noted above, there is a substantial amount of oyster culturing activity in the general vicinity of both shores 1 and 2. It is not possible from the information collected as part of this work to determine if there has been any effect on the flora and fauna.

The sedimentological and biological data from the sublittoral sites demonstrate that inner Clew Bay has a well-developed and diverse macrofauna. No two sites were the same in terms of the macrofauna even though as described above, sedimentological similarities were noted. The biological differences may be attributed to microscale variations in current pattern and water quality giving rise to differences in primary production. Only one site, Station 10 returned no faunal material from the cores. This was due to the poor sediment and water sediment interface conditions i.e. very shallow redox levels and the presence of *Beggiatoa* mats. All the remaining 11 sites proved to be of interest even though some of them , Stations 2, 7 and 12 were somewhat poor in species numbers and individuals. This is probably due to the fact that the bottom type was sandy with shell debris, a biotope that can be low in diversity terms. Stations 3, 4 and 11 were muddy habitats and were rich in species and numbers of individuals. Station 1, which was a maerl bed, returned an extensive list of crustaceans. Finally Stations 6 and 9 were epifaunal communities and this is reflected in the species groups recorded at each site.

Some species that were recorded during the course of this survey are noteworthy in that they have only been recorded at a small number of sites previously. This may simply

due to the low level of collecting on a National scale rather than reflecting a true rareness of the taxon. Such species include *Leucernariopsis cruxmelitensis, Pionosyllis* sp., *Pista maculata* and *Calyptraea sinensis.*

The classification of benthic communities into precise and recurring groupings on a broad geographic scale historically has proved difficult. The descriptions of groupings of benthic macroinvertebrates in Petersen (1911, 1913, 1915), Southern (1914), Jones (1950), Ford (1923), Thorson (1957), Buchanan (1963) and Cabioch (1968) all demonstrate that there is a great variety in species composition of assemblages that at first appraisal appear similar. The composition of marine benthic macroinvertebrate communities is controlled to a large extent on physical factors such as current speed and substrate type. These physical forces give rise to a continuum in substrate types with their associated microhabitats. Abrupt discontinuities in sedimentary types are unusual in the marine environment and species compositions therefore tend to change gradually. Other factors which regulate species compositions are local hydrographic features which may contain larvae in a particular area, larval behavioural patterns which help the larvae to recruit back into the parent population and latitudinal and water depth differences.

It is therefore not difficult to understand why the intercomparison of the sediment-type sublittoral sites sampled in Clew Bay with those described by Hiscock (1996) and Connor *et al.* (1997) showed little commonality. This is due to the fact that there is a very large variability in the types of habitats and therefore the species groupings that occur in a particular biotope. For instance, Connor *et al.* describe an *Amphiura/Echinocardium* assemblage as being of just 1 type. It is well understood however that this particular "community" has many different manifestations even within the same geographic area (see O'Connor *et al.*, 1992). A similar comment has already been made on the different types of maerl species groupings.

From a marine biological view and based on the relatively small data set generated by this survey of 4 shores and 12 sublittoral sites, Clew Bay is of high scientific interest. The habitats within the islands are highly diverse and the species composition is similarly varied. Add to this the fact that the greater bay area, including the off shore islands, was not sampled and the fact that the area in general is the type locality for a number of polychaete species and Clew Bay assumes an even higher level of importance.

References cited in text

Buchanan, J. 1963. The bottom faunal communities and their sediment relationships off the coast of Northumberland. Oikos, 14 : 154 – 173.

Cabioch, L. 1968. Contribution a la connaissance des peuplements benthiques de la manche occidentale. Cahiers de marine biologie, 9 : 493 – 711.

Connor, D., Brazier, D., Hill, T., Holt, R., Northen, K. and Sanderson, W. 1996. Marine Biotopes - A working classification for the British Isles. Joint Nature Conservation Committee. Version 96.7. Peterborough. 340 pps.

Ford, E. 1923. Animal communities of the level sea bottom in the water adjacent to Plymouth. Journal of the Marine Biological Association, U.K., 13 : 164.

Hiscock, K . (1996). Coasts and seas of the United Kingdom. Marine Conservation review. MNCR, Peterborough. 167 pps.

Howsen, C. and Picton, B. (1997). The species directory. Marine Conservation Society. Ross-on-Wye. pp 508.

Jones, N.S. 1950. Marine bottom communities. Biological Review of the Cambridge Philosophical Society, 25 : 283 – 313.

O'Connor, B., McGrath, D., Keegan, B. and Konnecker, G. 1992. Macrobenthic faunal assemblages in Galway Bay. Proceedings of the Royal Irish Academy, 93 B : 127 - 136.

Petersen, C. J. 1911/13. Valuation of the sea Parts I and II. Report of the Danish Biological Station. Vols. 20 and 21.

Petersen, C. J. 1915. On the animal communities on the sea bottom in the Skagarrak, Christiana Fjord and Danish waters. Report of the Danish Biological Station. 23 : 3 – 28.

Southern, R. 1914. Clare Island Survey. Part 47, Polychaeta. Proceedings of the Royal Irish Academy.

Southern, R. 1915. Clare Island Survey. Part 67, Marine Ecology. Proceedings of the Royal Irish Academy.

Thorson, G. 1957. Bottom communities. In : Treatise on Marine Ecology and Palaeoecology. J. Hedegpeth (ed.). Geological Society of America, 67 : 461 – 534.

Taxonomic references

Al-Ogilly, S.M. and Knight-Jones, E.W. 1981. *Circeis paguri*, the spirorbid polychaete associated with the hermit-crab *Eupagurus bernhardus*. *Journal of the Marine Biological Association of the UK*, **61**, 821—826.

Amaral, A.C.Z. 1980. Breve caracterizacao dos generos da familia Capitellidae Grube (Annelida, Polychaeta) e descricao de *Nonatus ongilineus* gen. et sp. nov. *Boletim do Instituto Oceangrafico Sao Paulo*, **29**, 99—106.

Bamber, R.N. 1983. Pycnogonida. The Marine Fauna of the Cullercoats District Number 12. Report of the Dove Marine Laboratory, Third Series Number 25, 24pp.

Bassindale, R. 1964. British Barnacles with Keys and Notes for the Identification of the Species. Synopses of the British Fauna Number 14. London, Linnean Society, 68pp.

Chambers, S. 1985. Polychaetes from Scottish Waters. Part 2, Families Aphroditidae, Sigalionidae and Polyodontidae. Edinburgh, Royal Scottish Museum Studies, 38pp.

Christie, G. 1984. A new species of *Tharyx* (Polychaeta: Cirratulidae) from five estuaries in north-east England. *Sarsia*, 69, 69—73.

Cornelius, P.F.S. 1975. The hydroid species of *Obelia* (Coelenterata, Hydrozoa: Campanulariidae), with notes on the medusa stage. *Bulletin of the British Museum (Natural History). Zoology,* **28**, 249—293.

Cornelius, P.F.S. 1975. A revision of the species of Lafoeidae and Haleciidae (Coelenterata: Hydroida) recorded from Britain and nearby seas. *Bulletin of the British Museum (Natural History).* Zoology, **28**, 373—426.

Cornelius, P.F.S. 1979. A revision of the species of Sertulariidae (Coelenterata: Hydroida) recorded from Britain and nearby seas. *Bulletin of the British Museum (Natural History). Zoology*, **34**, 243—321.

Cornelius, P.F.S. 1982. Hydroids and medusae of the family Campanulariidae recorded from the eastern north Atlantic, with a world synopsis of genera. *Bulletin of the British Museum (Natural History). Zoology*, **42**, 37—148.

Dauvin, J.C. and Bellan-Santini, D. 1988. Illustrated key of *Ampelisca* species from the north-eastern Atlantic. *Journal of the Marine Biological Association of the UK*, **68**, 659—676.

Day, J.H. 1967. Polychaeta of Southern Africa. Part 1 . Errantia. London, The British Museum (Natural History), 487pp.

Day, J.H. 1967. Polychaeta of Southern Africa. Part 2. Sedentaria. London, The British Museum (Natural History), 419pp.

Fauchald, K. 1963. Nephtyidae (Polychaeta) from Norwegian waters. *Sarsia*, **13**,1—32.

Fauchald, K. 1977. The Polychaete worms. Definitions and Keys to the Orders, Families and Genera. *Natural History Museum of Los Angeles County. Science Series*, **28**, 1—188.

Fauvel, P. 1923. Faune de France. 5, Polychètes Errantes (Kraus reprint Nendeln/Lichtenstein, 1975), 488pp.

Fauvel, P. 1927. Faune de France. 16, Polychètes Sedentaires (Kraus reprint Nendeln/Lichtenstein, 1977), 494pp.

Fretter, V. and Graham, A. 1976. The Prosobranch Molluscs of Britain and Denmark. Part 1. Pleurotomariacea, Fissurellacea and Patellacea. *Journal of Molluscan Studies*, Supplement 1, 1—37.

Fretter, V. and Graham, A. 1977. The Prosobranch Molluscs of Britain and Denmark. Part 2. Trochacea. *Journal of Molluscan Studies*, Supplement 3, 37—100.

Fretter, V. and Graham, A. 1978. The Prosobranch Molluscs ot Britain and Denmark. Part 3. Neritacea, Viviparacea, Valvatacea, Terrestrial and Freshwater Littorinacea and Rissoacea. *Journal of Molluscan Studies*, Supplement 5, 101—152.

Fretter, V. and Graham, A. 1978. The Prosobranch Molluscs of Britain and Denmark. Part 4. Marine Rissoacea. *Journal of Molluscan Studies*, Supplement 6,153—241.

Fretter, V. and Graham, A. 1980. The Prosobranch Molluscs of Britain and Denmark. Part 5. Marine Littorinacea. *Journal of Molluscan Studies*, Supplement 7, 242—284.

Fretter, V. and Graham, A. 1981. The Prosobranch Molluscs of Britain and Denmark. Part 6. Cerithacea, Strombacea, Hipponicacea, Calyptraeacea, Lamellariacea, Cypraeacea, Naticacea, Tonnacea, Heteropoda. *Journal of Molluscan Studies,* Supplement 9, 285—362.

Fretter, V. and Graham, A. 1982. The Prosobranch Molluscs of Britain and Denmark. Part 7 Heterogastropoda (Cerithiopsacea, Triforacea, Epitoniacea, Eulimacea. *Journal of Molluscan Studies*, Supplement 11, 363—434 .

Fretter, V. and Graham, A. (Undated). The Prosobranch Molluscs of Britain and Denmark. Part 8. Neogastropoda. *Journal of Molluscan Studies*, Supplement 15, 435—556.

Fretter, V., Graham, A. and Andrews, E.B. 1986. The Prosobranch Molluscs of Britain and Denmark. Part 9. Pyramidellacea. *Journal of Molluscan Studies*, Supplement 16, 557—649.

Garwood, P.R. 1981. Polychaeta - Errantia. The Marine Fauna of the Cullercoats District, Number 9. Report of the Dove Marine Laboratory, Third Series, Number 22,192pp.

Garwood, P.R. 1982. Polychaeta - Sedentaria incl. Archiannelida. The Marine Fauna ot the Cullercoats District, Number 10. Report of the Dove Marine Laboratory, Third Series, Number 23, 273pp.

Garwood, P.R. 1986. A key to the family Nephtyidae including juveniles. EBSA Workshop. Errant Polychaetes. Heriot Watt University, 1986. (Unpublished Material).

Garwood, P.R. 1986. Key to the family Nereididae including juveniles. EBSA Workshop. Errant Polychaetes. Heriot Watt University, 1986. (Unpublished Material).

Garwood, P.R. and Bamber, R.N. 1988. A new genus and species of capitellid Polychaeta from north-east England. *Ophelia*, **29**,119—126.

George, J.D. and Hartmann-Schröder, G. 1985. Polychaetes: British Amphinomida, Spintherida and Eunicida. Synopses of the British Fauna (new series), Number 32. Linnean Society, EBSA. Leiden, E.J. Brill/Dr W.Backhuys, 221pp.

Gibbs, P.E. 1974. *Golfingia margaritacea* (Sipuncula) in British waters. *Journal of the Marine Biological Association of the UK*, **54**, 870—877.

Gibbs, P.E. 1977. On the status of *Golfingia intermedia* (Sipuncula). *Journal of the Marine Biological Association of the UK*, **57**, 109—112.

Gibbs, P.E. 1977. British Sipunculans. Synopses of the British Fauna (new series), Number 12. Linnean Society. London and New York, Academic Press, 35pp.

Gidholm, L. 1966. A revision of *Autolytinae* (Syllidae, Polychaeta) with special reference to Scandinavian species, and with notes on external and internal morphology, reproduction and ecology. *Arkiv for Zoologi, Series 2*, **19**, 157—213.

Gotto, D.M. and Gotto, R.V. 1972. Labidoplax media Oestergren: A sea cucumber new to Brilish and Irish waters, with observational notes. *Irish Naturalists' Journal*, **17**, 250—252.

Graham, A. 1971. British Prosobranchs. Synopses of the British Fauna (new series) Number 2. Linnean Society, EBSA. London and New York, Academic Press, 112pp.

Hammond, R. 1967. Sheet 113: Polychaeta; Syllidae. *Fiches d'identification du zooplancton. Conseil International pour l'Exploration de la Mer.*

Hardy, F.G. 1985. Flora: Seaweeds. The Marine Fauna of the Cullercoats District, Number 17. Report of the Dove Marine Laboratory, Third Series, Number 30, 71pp.

Harrison, R.J. 1944. Caprellidae. Synopses of the British Fauna Number 2. Caprellidae. London, Linnean Society, 27pp.

Hartley,J.P. 1981. The family Paraonidae (Polychaeta) in British waters: a new species and new records with a key to species. *Journal of the Marine Biological Association of the UK*, **61**, 133—149 .

Hartley, J.P. 1984. Cosmopolitan polychaete species: the status of *Aricidea belgicae* (Fauvel 1936) and notes on the identity of *A. suecica* Eliason, 1920 (Polychaeta; Paraonidae) . *Hutchings, P.A. ed. Proceedings of the First International Polychaete Conference*, Sydney. Linnean Society of New South Wales, 7—20.

Hartley, J.P. 1985. The re-establishment of *Amphicteis midas* (Gosse1855) and redescription of the type material of *A. gunneri* (M. Sars, 1835) (Polychaeta: Ampharetidae). *Sarsia*, **70**, 309—315.

Hartmann-Schröder, G. 1971. Annelida, Borstenwurmer, Polychaeta. Die Tierwelt Deutschlands, 58 Teil. Jena, Gustav Fischer, 594p

Hayward, P.J. 1985. Ctenostome Bryozoans. Synopses of the British Fauna (new series), Number 33. Linnean Society, EBSA. Leiden, E.J. Brill/Dr W Backhuys, 169pp.

Hayward, P.J. and Ryland, J.S. 1979. British Ascophoran Bryozoans. Synopses of the British Fauna (new series), Number 14. Linnean Society, EBSA. London, Academic Press, 312pp.

Hiscock, S. (Undated). A field guide to the British brown seaweeds. (Phaeophyta). Field Studies Council, (Unpublished material).

Holdich, D. 1988. British shallow-water Isopoda with a key to families. EBSA Small Crustacea Workshop, Bangor, April 1988, (Unpublished material).

Holthe, T. 1975. A simple key to the Northern European Species of Terebellomorphe Polychaeta. Oslo, Universitets-forlaget, 32pp.

Holthe, T. 1986. Polychaeta Terebellomorpha. Marine invertebrates of Scandinavia, Number 7. Oslo, Norwegian University Press, 194pp.

ten Hove, H.A. 1984. Key to the genera of the family Serpulidae. EBSA Workshop: Sedentary Polychaeta, Swansea, 1984. (Unpublished material).

Howson, C.M. ed. 1987. Species Directory of British Marine Fauna and Flora. Ross-on-Wye, Marine Conservation Society, 471pp.

Hutchings, P.A. ed. 1984. Proceedings of the First International Polychaete Conference, Sydney. Linnean Society of New South Wales, 483pp.

Ingle, R.W. 1980. British Crabs. Oxford, University Press, 222pp.

Ingle, R.W. 1983. Shallow Water Crabs. Synopses of the British Fauna (new series) Number 25. Linnean Society, EBSA. Cambridge, University Press, 213pp.

Jones, M.L. 1977. A redescription of *Magelona papillicornis* F. Muller. *Reish, D.J. and Fauchald, K. eds. Essays on Polychaetous Annelids. In Memory of Dr Olga Hartman.* Los Angeles, Allan Hancock Foundation, 247—266.

Jones, N.S. 1976. British Cumaceans. Synopses of the British Fauna (new series), Number 7. Linnean Society. London and New York, Academic Press, 64pp.

King, P.E. 1974. British Sea Spiders. Synopses of the British Fauna (new series) Number 5. Linnean Society. London and New York, Academic Press, 68pp.

Kingston, P.F. and Duff, A. 1987. Hartmann-Schröder's key to the polychaete annelids from the North Sea and Baltic approaches. Translated by M. Ingold and M. Riddle, Institute of Offshore Engineering, Heriot-Watt University, 63pp.

Knight-Jones, P. and Knight-Jones, E.W. 1977. Taxonomy and ecology of British Spirorbidae (Polychaeta). *Journal of the Marine Biological Association of the UK*, **57**, 453—499.

Knight-Jones, P. 1985. Key to the family Sabellidae. EBSA Sedentary Polychaete Workshop. Heriot Watt, 1985. (Unpublished material).

Lemche, H. 1976. New British species ot *Doto* Oken, 1815 (Mollusca: Opisthobranchia). Journal of the Marine Biological Association of the UK, 56, 691—706.

Lincoln, R.J. 1979. British Marine Amphipoda: Gammaridea. London, British Museum (Natural History), 658pp.

Maciolek, N.J. 1984. New records and species of *Marenzellaria* Mesnil and *Scolecolepides* Ehlers (Polychaeta: Spionidae) from northeastern north America. *Hutchings, P.A. ed. Proceedings of the First International Polychaete Conference, Sydney.* Linnean Society of New South Wales, 48—62.

Maciolek, N.J. 1985 A review of the genus *Prionospio malmgreni*, with special emphasis on species from the Atlantic Ocean, and new records of species belonging to the genera *Apoprionospio* Foster and *Paraprionospio* Caullery. (Polychaeta Annelida, Spionidae). *Zoological Journal of the Linnean Society*, **84**, 325—383

Mackie, A.S.Y. 1984 On the identity and zoogeography of *Prionospio cirrifera* Wiren, 1883 and *Prionospio multibranchiata* Berkeley, 1927 (Polychaeta Spionidae). *Hutchings, P.A. ed. Proceedings of the First International Polychaete Conference, Sydney.* Linnean Society of New South Wales, 25—47.

Mackie, A.S.Y 1987. A review of species currently assigned to the genus *Leitoscoloplos* Day, 1977 (Polychaeta: Orbiniidae), with descriptions of species newly referred to *Scoloplos* Blainville, 1828. *Sarsia*, **72**,1—28.

Mackie, A.S.Y. and Duff, A.A. 1986 *Atherospio disticha* gen. et sp. nov. (Polychaeta: Spionidae) from Loch Tuirnaig, west coast of Scotland. *Ophelia*, 25, 139—146.

Mackings, P. 1977. A Guide to the British Coastal Mysidacea. *Field Studies*, **4**, 575—595.

Manuel, R.L. 1979. Some new records of Anthozoa from British Waters. *Journal of the Marine Biological Association of the UK*, **59**, 393—397.

Manuel, R.L. 1981. British Anthozoa. Synopses of the British Fauna (new series) Number 18. Linnean Society, EBSA. London and New York, Academic Press, 241pp.

Matthews, G. 1952. The identification of British chitons. Papers for Students, No. 9. The Conchological Society of Great Britain and Ireland, 4pp.

Matthews, G. 1953. A key for use in the identification of British chitons. *Proceedings of the Malacological Society, London*, **29**, 241—248.

Millar, R.H. 1970. British Ascidians. Synopses of the British Fauna (new series), Number 1. Linnean Society. London and New York, Academic Press, 92pp.

Moore, J.J. 1987. Crustacea: Decapoda. The Marine Fauna of the Cullercoats District Number 21. Report of the Dove Marine Laboratory, Third Series, Number 34, 81pp.

Moore, P.G. 1983. On the male of *Sophrosyne robertsoni* Stebbing and Robertson (Crustacea, Amphipoda). *Zoological Journal of the Linnean Society*, **77**, 103—109.

Moore, P.G. 1984. The amphipod *Monoculodes gibbosus* (Crustacea) in British waters. *Journal of the Marine Biological Association of the UK*, **64**, 271—278.

Mortensen, T.H. 1977. Handbook of the Echinoderms of the British Isles. Rotterdam, W. Backhuys, 571pp.

Myers, A.A. and Costello, M.J. 1984. The amphipod genus *Aora* in British and Irish Waters. *Journal of the Marine Biological Association of the UK*, **64**, 279—283.

Myers, A.A. and Costello, M.J. 1986. The amphipod sibling pair *Leucothoe lilljeborgi* and *L. incisa* in British and Irish waters. *Journal of the Marine Biological Association of the UK*, **66**, 75—82.

Myers, A. and McGrath, D. 1981 . Taxonomic studies on British and Irish Amphipoda. The genus *Photis* with the re-establishment of *P. pollex* (= *P. macrocoxa*). *Journal of the Marine Biological Association of the UK*, **61**, 759—768 .

Myers, A.A. and McGrath, D. 1982. Taxonomic studies on British and Irish Amphipoda. Re-establishment of *Leucothoe procera*. *Journal of the Marine Biological Association of the UK*, **62**, 693—698.

Myers, A.A. and McGrath, D. 1982. Taxonomic studies on British and Irish Amphipoda. The genus Gammaropsis. *Journal of the Marine Biological Association of the UK*, **62**, 93—100.

Myers, A.A. and McGrath, D. 1984. A revision of the north-east Atlantic species of *Erichthonius* (Crustacea: Amphipoda). *Journal of the Marine Biological Association of the UK*, **64**, 379—400.

Myers, A.A., McGrath, D. and Costello, M.J. 1987. The Irish species of *Iphimedia* Rathke. (Amphipoda: Acanthonotozomatidae). *Journal of the Marine Biological Association of the UK*, **67**, 307—321.

Myers, A.A., McGrath, D. and Cunningham, P. 1989. A presumed male of the parthenogenetic amphipod *Corophium bonnellii* (Milne-Edwards). *Journal of the Marine Biological Association of the UK*, **69**, 319—322.

Naylor, E. 1972. British Marine Isopods. Synopses of the British Fauna (new series), Number 13. Linnean Society. London and New York, Academic Press, 58pp.

O'Connor, B.D.S. 1985. Eunicida. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1985. Glyceridae and Goniadidae. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1985. Hesionidae. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1985. Phyllodocidae. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1985. Pilargidae. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1985. Key to the genera of the Syllidae with sketches. EBSA Errant Polychaete Workshop. Heriot Watt University, Edinburgh 1985. (Unpublished material).

O'Connor, B.D.S. 1987. Redescription of *Anaitides rosea* (McIntosh, 1877) (Polychaeta: Phyllodocidae), with notes on nomenclature, ecology and distribution and a key to the genera of Phyllodocinae from the NE Atlantic. *Irish Naturalists' Journal*, **22**, 310—314.

O'Connor, B.D.S. 1987. The Glyceridae (Polychaeta) ot the north Atlantic and Mediterranean with descriptions ot two new species. *Journal of Natural History*, **21**, 167—189.

O'Connor, B.S., Dinneen, P., Conneely, M. and Bowmer, T. 1984. Notes on the Irish Paraonidae (Polychaeta) with records ot two species new to Ireland. *Irish Naturalists' Journal*, **21**, 193—236.

Oug, E. 1978. New and lesser known Dorvilleidae (Annelida, Polychaeta) from Scandinavian and northeast American waters. *Sarsia*, **63**, 285—303.

Parker, M. 1987. *Anaitides longipes* Kinberg, 1866 (Polychaeta: Phyllodocidae): Notes on nomenclature, identification, habitat and distribution. *Irish Naturalists' Journal*, **22**, 193—194.

Pearson, T.H. 1969. *Scionella lorensis* sp. nov. a new terebellid (Polychaeta: Annelida) from the west coast of Scotland with notes on the genus *Scionella* Moore, and a key to the genera of the Terebellidae recorded from European waters. *Journal of Natural History*, **3**, 509—516.

Pettibone, M.H. 1963. Marine Polychaete Worms of the New England Region. 1 Families Aphroditidae Through Trochochaetidae. Washington, Smithsonian Institution, 356pp.

Pilato, G. and Cantone, G. 1976. Nuove specie di *Poecilochaetus* e considerazioni sulla famiglia dei Poecilochaetidae (Annelida, Polychaeta). *Animalia*, **3**, 29—63.

Pleijel, F. 1985. *Prionospio ockelmanni* sp. n. (Polychaeta: Spionidae) from the Oresund and the northern part of the Swedish - west coast. *Ophelia*, **24**, 177—181.

Pleijel, F. 1985. Three new phyllodocid species (Polychaeta) from the Trondheimsfjord in Norway, including some notes concernin9 the validity of the genus *Steggoa*. Zoologica Scripta, 16, 25—31.

Pleijel, F. 1987. Two new European species of *Eulalia* (Polychaeta: Phyllodocidae). *Journal of the Marine Biological Association of the UK*, **67**, 399—405.

Rainer, S.F. 1984. *Nephtys pente* sp. nov. (Polychaeta: Nephtyidae) and a key to the *Nephtys* from northern Europe. *Journal of the Marine Biological Association of the UK*, **64**, 899—907.

Ramberg, J.P. and Schram, T.A. 1983. A systematic review of Oslofjord species of *Polydora* Bosc and *Pseudopolydora* Czerniavsky with some new biological and ecological data. *Sarsia*, **68**, 233—247.

Riser, N.W. 1987. Observations on the genus *Ophelia* (Polychaeta: Opheliidae) with the description of a new species. *Ophelia*, **28**, 11—29.

Ryland, J.S. and Hayward, P.J. 1977. British Anascan Bryozoans. Synopses of the British Fauna (new series), Number 10. Linnean Society. London and New York, Academic Press, 188pp.

Salvini-Plawen, L.V. 1975. Mollusca; Caudofoveata. Marine Invertebrates of Scandinavia Number 4. Oslo, Scandinavian University Books, 55pp.

Salvini-Plawen, L.V. 1987. Mesopsammic Cnidaria from Plymouth with systematic notes. *Journal of the Marine Biological Association of the UK*, **67**, 623—637.

Sheader, M. 1983. Amphipoda. The Marine Fauna of the Cullercoats District, Number 13. Report of the Dove Marine Laboratory, Third series, Number 20, 1 87pp.

Sheader, M. and Evans, F. 1974. The taxonomic relationship of *Parathemisto gaudichaudi* (Guerin) and *P. gracilipes* (Norman), with a key to the genus *Parathemisto*. *Journal of the Marine Biological Association of the UK*, **54**, 915—924.

Smaldon, G. 1979. British Coastal Shrimps and Prawns. Synopses of the British Fauna (new series) Number 25. Linnean Society, EBSA. Cambridge, University Press, 126pp.

Smaldon, G., Heppell, D. and Watt, K.R. 1976. Type specimens of invertebrates (excluding insects) held at the Royal Scottish Museum, Edinburgh. Royal Scottish Museum Information Series Natural History, 4, 118pp.

Smaldon, G. and Watt, K.R. 1974. A catalogue ot the Sipuncula, Echiura, Priapulida in the collections of the Royal Scottish Museum, Edinburgh. Royal Scottish Museum Information Series Natural History, **3**, 31pp.

Smith, S.M. 1974. Key to the British marine Gastropoda. Royal Scottish Museum Information Series Natural History, **2**, 48pp.

Southward, A.J. 1976. On the taxonomic status and distribution of *Chthamalus stellatus* (Cirripedia) in the northeast Atlantic region: with a key to the common intertidal barnacles of Britain. *Journal of the Marine Biological Association of the UK*, **56**, 1007—1028.

Southward, A.J. and Crisp, D.J. 1963. Catalogue of Marine Fouling Organisms. Vol. 1 Barnacles. Seattle, Organisation for Economic Cooperation and Development, 46pp.

Spooner, G.M. 1960. The occurrence of *Ingolfiella* in the Eddystone shell gravel, with description of a new species. *Journal of the Marine Biological Association of the UK*, **39**, 319—329.

Stephen, A.C. 1960. British Echiurids (Echiuroidea), Sipunculids (Sipunculoidea) and Priapulids (Priapuloidea). Synopses of the British Fauna, Number 12. Linnean Society. Dorking, Bartholomew Press, 27pp.

Stephen, A.C. and Edmonds, S.J. 1972. The phyla Sipuncula andEchiura. London, British Museum (Natural History), 528pp. *Field Studies,* **5**, 425—468.

Tebble, N. 1976 2nd ed. British Bivalve Seashells. Edinburgh, HMSO, 21 2pp.

Tebble, N. and Chambers, S. 1982. Polychaetes from Scottish waters. Part 1 Family Polynoidae. Edinburgh, Royal Scottish Museum Studies, 73pp.

Thompson, T.E. and Brown, G.H. 1976. British Ophisthobranch Molluscs. Synopses of the British Fauna (new series), Number 8. Linnean Society. London and New York, Academic Press, 204pp.

Ushakov, P.V. 1974. Fauna of the USSR. Polychaetes. Vol. 1. Phyllodociformia. Washington, Smithsonian Institution and National Science Foundation, 259pp.

Wheeler, A. 1978. Key to the Fishes ot Northern Europe. London, Warne and Co., 380pp.

Wilson, D.P. 1958. The polychaete *Magelona alleni* n. sp. and a reassessment of *Magelona cincta* Ehlers. *Journal of the Marine Biological Association of the UK*, **37**, 617—626.

Appendix I

INTERTIDAL SPECIES RECORDS

		JN 298 SH1 upper	JN 298 SH1 mid.	JN 298 SH1 lower	JN 298 SH2 upper	JN SH2 mid	JN 298 SH2 lower	JN 298 SH3 upper	JN 298 SH3 mid.	JN 298 SH3 lower	JN 298 SH4 upper	JN 298 SH4 mid	JN 298 SH4 lower
	Sponges												
C0484	Halichondria panicea									O			
C0523	Hymeniacidon perleve									O			
C0596	Esperiopsis fucorum									O			O
	Coelentrates												
D0422	Dynamena pumila (Not listed)												1
C1151	Actinia equina						O		O				
	Nemertean												
G0050	Lineus sp. (Not listed)								P			O	
	Spiunculids												
N0007	Golfingia sp	O											
	Polychaetes												
P0097	Harmothoe sp					O							
P0059	Harmothoe fragilis (Not listed)		2										
P0181	Sigalion matildae		1				1						
P0871	Nepthys hombergii		1										
P0984	Marphysa belli		2										
P0665	Orbinia cuvieri (Not listed)						1						
P1408	Cirratulus cirratus	O											
P1031	Archiannelid (Not listed)	P											
P1576	Arenicola marina	1/m2											R
P0944	Praxillura longissima (Not listed)						1						
P0957	Leiochone clypeata (Not listed)		11				1						
P2000	Terebellidae indet.					O							
P2019	Eupolymnia nebulosa									F			O
P2030	Lanice sp.						P						
P2031	Lanice conchilega			C	2								
P2304	Pomatoceros triqueter		O			O	O			O		O	O
P2355	Spirorbidae	O	C			O	O		O	C		O	O
P1396	Spirorbis borealis (Not listed)												1
P1369	Circeis spirillum (Not listed)												1
	Crustaceans (Class Cirripedia)												
R0021	Cirripedia	O				F		O	O		O		
R0120	Elminius modestus	1											
R0106	Balanus sp.												O
R0109	Balanus balanus				1								
R0110	Balanus crenatus	1											
	Crustaceans (Class Malacostraca)												
S0166	Amphipoda					F		O	O		O		O
S0228	Talitrids (Not listed)	P											
S0759	Gammaridae indet.	P			C	F	O	O	O		O		
S1789	Ligia oceanica	P			P			O			O		
S2465	Pagurus bernhardus		R			R	O						O
S2672	Necora puber					O							
S2690	Carcinus maenas						O		O	O	P	P	O

	Mollusca Class Gastropoda												
W0074	Lepidochitona cinerea								O				
W0193	Gibbula cineraria		O										O
W0195	Gibbula umbilicalis	F				C			O	O		O	O
W0200	Calliostoma zizyphinum												R
W0134	Patella vulgata	R			5	5	5		O	O	1	O	O
W0250	Littorina littorea		O			C							R
W0254	Littorina mariae	O	O			O				O	O	O	O
W0260	Littorina saxatilis								O				R
W0309	Littorina neritoides (Not listed)	O				F			O	O	O		
W0829	Ocenebra erinacea		R										
W0817	Nucella lapillus	O							O	F			O
W1650	Mytilus edulis	O				C				O			R
W1672	Modiolus sp									O			
W1674	Modiolus barbatus	2	1										
W1800	Chlamys varia									P			
W1815	Anomia ephippium					O				O			
W2351	Thracia phaseolina					1							
W1975	Parvicardium exiguum											1	
W1991	Cerastoderma edule		1								2	1	
W2025	Ensis ensis		P	P									
W2046	Angulus tenuis		3			5							
W2189	Chamelea striatula		1			2	1						
W1852	Thyasira flexuosa		2										
	Bryozoa												
Y0678	Electra pilosa												1
Y0725	Callopora lineata												1
Y0440	Schizoporella unicornis												1
	Echinodermata												
ZB019 (0)	Asterias rubens												R
	Hemichordata (Class Ascidia)												
ZD011 (7)	Ciona intestinalis					R				R			
ZD019 (4)	Dendrodoa grossularia	O	O										
ZD020 (9)	Botryllus schlosseri					O				O			O
	Chordata (Class Osteichthyes)												
ZM038 (4)	Corallinaceae sp.	O							O				O
ZM061 (1)	Chondrus crispus		O										
ZR062 (5)	Chorda filum						O.						R
ZR066 (4)	Ascophyllum nodosum	A	O			O	O.		O	C		F	R
ZR067	Fucus serratus	R	C			20%	F			C			O
ZR067	Fucus spiralis	O							F		A		
ZR067	Fucus vesiculosus	O	F			30%	O		C	F		C	
ZR068 (1)	Pelvetia canaliculata	A						A			O		
ZS021 (5)	Enteromorpha sp.		C							O		P	5%
ZS024 (0)	Ulva sp		O										
ZY003 (6)	Verrucaria maura	P						15%	40%		5%		
ZY004 (2)	Xanthoria parietina	P						1%			2%		
ZY000 (9)	Caloplaca marina							10%					
ZY004 (3)	Grey lichens	P						1%					

Appendix II

SUBTIDAL SPECIES RECORDS

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
	Sponges											
C0053	Scypha ciliata							F				
C0218	Suberites sp.										P	
C0220	Suberites ficus							O				
C0221	Suberites carnosus											O
C0408	Stelligera stuposa							O				
C0475	Cliona sp.							P				
C0484	Halichondria panicea									P		
C0523	Hymeniacidon perleve									P		
C0596	Esperiopsis fucorum							C				
C0775	Hemimycale columella							O				
C0683	Iophon/Iophonopsis							F				
C0642	Myxilla sp				O							
C0429	Raspailia ramosa							O				
C0858	Haliclona fistulosa							F				
C0865	Haliclona viscosa							R				
C0890	Dysidea fragilis							O				
	Coelentrates											
D0018	Leucernariopsis cruxmelitensis (Not liste		1									
D0335	Hydractinia echinata							F	C	O		O
D0526	Halecium halecinum							A			P	P
D0667	Sertularella gayi (Not listed)							1				
D0669	Sertularella polyzonias							1				
D0578	Halopteris catharina							1				
D0585	Kirchenpaueria pinnata							1				
D0597	Nemertesia antennina						1	2	O			O
D0599	Nemertesia ramosa						1	P R				1
D0605	Plumularia setacea						1					
D0554	Aglaophenia pluma							1				
D0730	Obelia dichotoma							1				1
D0731	Obelia geniculata									F		
D0732	Obelia longissima							R				
D1024	Alcyonium digitatum							O				
D1075	Cerianthus lloydii			O			O	O	P		C	O
D1158	Anemonia viridis						P	O		R		O
D1225	Metridium senile			R			O	F		O	C	O
D1231	Sagartia elegans					P		R	O			
D1232	Sagartia troglodytes						O				O	

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
D1237	Cereus pedunculatus							O				
D1247	Sagartiogeton laceratus											R
D1371	Grey anemone, small with white tips							F				
	Priapulids											
J0007	Priapulus caudatus (Not listed)				1							
	Spiunculids											
N0007	Golfingia sp							1				
N0019	Golfingia procera		1					1	10			
N0028	Phascolion strombus			1		1						4
P0001	**Polychaetes**											
P0032	Adyte pellucida (Not listed)							1				
P0097	Harmothoe sp	3	4	1	2	2	1	1				
P0052	Harmothoe antilopes (Not listed)				1			1				
P0059	Harmothoe fragilis (Not listed)							4				
P0107	Harmothoe impar							2				
P0133	Lepidonotus squamatus							7				7
P0092	Pholoe inornata		1				1	6				2
P0160	Sigalionidae sp.								1			
P0187	Sthenelais boa						1					
P0126	Eteone barbata (Not listed)	1										
P0146	Anaitides rosea (Not listed)						1					
P0151	Eulalia aurea (Not listed)							4				1
P0283	Eumida bahusiensis		3	1	1		1					
P0167	Eumida sanguinea (Not listed)							1				
P0176	Paranaitis kosteriensis (Not listed)							1				
P0205	Eteone longa								1			
P0203	Eteone flava		1					1				
P0321	Syllidia peramata (Not listed)						1					
P0255	Glycera sp							1				
P0260	Glycera lapidum	1					1	2				
P0271	Goniada maculata							1				
P0291	Sphaerodorum gracilis (Not listed)											1
P0293	Hesionidae sp						1					
P0311	Nereimyra punctata(Not listed)		1									2
P0635	Syllidae sp						1					
P0365	Typosyllis armillaris(Not listed)						1					

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
P0380	Eusyllis blomstrandii						1	2				16
P0700	Odontosyllis gibba						1					1
P0395	Pionosyllis sp.(Not listed)											1
P0424	Sphaerosyllis sp. (Not listed)					1						
P0761	Autolytus sp							1				
P0444	Autolytus prolifer (Not listed)											1
P0803	Nereis sp.								1			
P0842	Perinereis cultrifera				1							
P0849	Platynereis dumerilii	22	5		1	7	5	8				4
P0867	Nephtys sp		1					2				
P0870	Nephtys cirrosa						1					
P0871	Nepthys hombergii			8		1			4			
P0979	Lysidice ninetta							1				
P1008	Lumbrineris gracilis					1		6	6			
P0606	Dorvillea sp (Not listed)							3				
P1138	Orbinia sp.						1					
P1142	Orbinia latreilli				1							
P1152	Scoloplos armiger		1		4	5	11	1	3			
P0718	Poecilochaetus serpens(Not listed)						1					
P1225	Spionidae sp		1									
P1274	Polydora sp						1					
P0750	Polydora caeca (Not listed)											1
P0757	Polydora hoplura (Not listed)											11
P0772	Polydora antennata			1			2					
P0765	Prionospio fallax	P										
P0747	Minuspio cirrifera	1	1				1	3	1			
P0746	Prionospio cf multibranchiata						1					
P1375	Chaetopterus variopedatus						O	O	O			O
P0832	Chaetozone sp				1		1	1				
P0832	Chaetozone "shallow" type (Not listed)								8			
P1414	Cirriformia tentaculata							3				
P0878	Diplocirrus glaucus								1			2
P0884	Pherusa flabellata (Not listed)											2
P0885	Pherusa plumosa							2				
P0919	Mediomastus fragilis (Not listed)				3							
P1563	Notomastus latericeus		2		6	1		2				2
P1591	Maldanidae sp			33			1					
P0960	Euclymene sp			32		5	2	1	25			
P1727	Polyophthalmus pictus	15	18		1	1	25	1				1

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
P1743	Scalibregma inflatum		2		1			1				
P1094	Myriochele sp (Not listed)						1					
P2000	Terebellidae indet.							F		O		
P1886	Melinna palmata			4	24	1		2	9			
P1133	Ampharete sp							1				
P1142	Amphicteis gunneri (Not listed)							1	1			
P1175	Terebellides stroemi			1	12							
P2019	Eupolymnia nebulosa			O				1				
P2031	Lanice conchilega			1			C					
P1210	Nicolea venustula (Not listed)	2	1		2			4				
P1187	Pista maculata (Not listed)							1				
P1235	Polycirrus sp						1	1				
P2124	Polycirrus medusa											1
P2144	Thelepus cincinnatus							4				1
P2162	Branchiomma bombyx											1
P1290	Jasmineira elegans (Not listed)											1
P2221	Megalomma vesiculosum	1										
P2261	Sabella pavonina			F			O					R
P1334	Hydroides norvegica (Not listed)							1				1
P2302	Pomatoceros sp					1		O		F		
P2303	Pomatoceros lamarkii	17			4	28	5	1				41
P2304	Pomatoceros triqueter							1				O
P2309	Serpula vermicularis					1						
P2401	Spirorbis sp.									F		
P2417	Olighochaete sp		1		1							
	Pycnogonids											
Q0001	Pycnogonid sp						1					
Q0015	Achelia echinata						3	3				
	Crustaceans (Class Cirripedia)											
R0106	Balanus sp.									P		O
R0109	Balanus balanus					1						
R0110	Balanus crenatus					1		1		P		
	Crustaceans (Class Ostracoda)											
R2412	Ostracoda sp	2					2					
	Crustaceans (Class Malacostraca)											

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
S0005	Nebalia sp(Not listed)	1			2							
S0139	Praunus flexuosus								1			
S0101	Apherusa sp	1										
S0164	Gitana sarsi(Not listed)	1										
S0176	Leucothoe sp						1					
S0180	Leucothoe spinicarpa(Not listed)				4							1
S0207	Stenothoe sp	3										
S0248	Urothoe elegans						13					
S0430	Urothoe marina						4					
S0255	Harpinia crenulata(Not listed)				18							
S0265	Metaphoxus fultoni(Not listed)	2			1		1					
S0303	Lysianassa ceratina(Not listed)	2			7		1					4
S0305	Lysianassa plumosa(Not listed)	5										
S0330	Socarnes erythrophthalmus(Not list	7										
S0415	Dexamine spinosa	69			6							1
S0710	Ampelisca brevicornis			1								1
S0440	Ampelisca tenuicornis			2	3		1	1	2			
S0722	Ampelisca typica						3					
S0498	Melita obtusata(Not listed)								3			
S0898	Gammaropsis maculata (Not listed)	1					10					
S0552	Photis longicaudata(Not listed)								1			
S0561	Ericthonius sp	18										1
S0562	Ericthonius difformis(Not listed)	1										
S0563	Erichthonius fasciatus(Not listed)				1							
S0944	Ericthonius punctatus	2			3		17					
S0955	Jassa falcata						3					
S0577	Aora sp (Not listed)	2			1							
S0585	Lembos websteri(Not listed)				2							
S0588	Leptocheirus hirsutimanus(Not listed)						5					
S0591	Leptocheirus tricristatus(Not listed	2										
S0593	Microdeutopus anomalus	2			3							
S0598	Microdeutopus versiculatus(Not list	16		1	4		5					
S1017	Corophium sp	1			1		3					
S0610	Corophium bonellii (Not listed)	2										1
S1023	Corophium crassicorne						3					
S0641	Caprella acanthifera(Not listed)	43					11					
S0651	Pariambus typicus(Not listed)						1					
S0657	Phthisica marina				7		7		1			1
S0659	Pseudoprotella phasma (Not listed)	2					9	4				1

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
S0793	Gnathia sp (Not listed)	1					1					
S1191	Vautompsonia cristata (Not listed)	1										
S1228	Nannastacus unguiculatus (Not liste	1										
S2210	Palaemon serratus							O		O		
S2365	Nephrops norvegicus										C	
S2447	Anapagurus hyndmanni					12		1				
S2465	Pagurus bernhardus			C		C		F	C	C	O	C
S2468	Pagurus cuanensis			13								
S2489	Galathea squamifera							F				
S2502	Pisidia longicornis			1	O			1				
S2553	Maja squinado					O	O					R
S2559	Hyas araneus							O				
S2576	Inachus dorsettensis							P				
S2578	Inachus phalangium							1				
S1531	Macropodia linaresi (Not listed)							1				
S2585	Macropodia rostrata	2		O	O			O	O		O	O
S2646	Cancer pagurus										P	
S2669	Liocarcinus depurator			F	O		C	F	O	O	C	O
S2672	Liocarcinus puber			F			C	F	O		C	O
S1102	Tanaid sp	3			1		4					
	Mollusca Class Gastropoda											
W0046	Polyplacophora sp.		1				3	3				1
W0189	Gibbula magus									O		
W0193	Gibbula cineraria									O		
W0139	Helcion pellucidum						2					
W0442	Turritella communis			12		21			23			O
W0306	Littorina tenebrosa (Not listed)							1				
W0285	Rissoa parva				1							4
W0371	Onoba semicostata (Not listed)							7				4
W0436	Calyptraea chinensis (Not listed)	2	6	1		3	1	4	1			1
W0844	Buccinum undatum							O	P	O		R
W1134	Limapontia		?									
W0953	Nudibranch sp	1					3					
W1319	Acanthodoris pilosa											2
W1336	Adalaria proxima (Not listed)							1				
W1431	Janolus cristatus							O				
W1513	Eubranchus farrani							A				
W1515	Eubranchus tricolor							2				1

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
W1616	Nucula sp							4	1			
W1565	Nucula turgida (Not listed)							39				
W1619	Nucula nucleus							1				
W1571	Nucula sulcata							2				
W0648	Mytilacea sp		1					4				
W1648	Mytilidae	1										
W1672	Modiolus sp		1									
W1664	Musculus discors							7				3
W1769	Ostrea edulis			O								
W1809	Pecten maximus								O		R	R
W1805	Aequipecten opercularis	3	6			2	3	35				30
W1795	Chlamys sp	1				O						F
W1800	Chlamys varia						C	5				
W1806	Anomia sp										O	
W1807	Anomia ephippium			O		6		5				12
W1842	Lucinoma borealis											1
W2351	Thracia phaseolina							10				5
W1905	Mysella bidentata	3	1				5	25	3			
W1975	Parvicardium exiguum						6	65	1			2
W1951	Parvicardium ovale								1			
W1991	Cerastoderma edule							59	1			
W2003	Spisula elliptica											1
W2002	Spisula sp						1	3				
W2022	Ensis sp.						C					O
W2102	Abra alba	3		6	3	1	1	21	2			
W2104	Abra nitida				1							1
W2189	Chamelea striatula		1			2		2	1			4
W1852	Thyasira flexuosa			24				16	8			
W2104	Timoclea ovata (Not listed)						6	411				2
W2181	Tapes rhomboides	6	2				7	49	1			3
W2162	Dosinia lupinus						1	2				2
W2225	Mya sp						2					1
W2157	Corbula gibba						1	15	5			1
W2251	Hiatella arctica	2						2				1
Y0000	**Bryozoa**											
ZA000	Phoronis sp							O				
Y0137	Alcyonidium diaphinum											O
Y0242	Amathia lendigera							1				

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
Y0678	Electra pilosa							1				
Y0279	Scrupocellaria scruposa							2				
Y0314	Escharoides coccinea					1						
Y0606	Cellepora pumicosa					1						
Y0134	Alcyonidium sp						P				O	
	Echinodermata											
ZB014	Crossaster papposus							O	P		R	
ZB016	Henricia oculata							O	P			R
ZB019	Asterias rubens						F			O		O
ZB020	Marthasterias glacialis						F					
ZB023	Ophiothrix fragilis							4				
ZB161	Amphiopholis squamata				1		8	21				1
ZB035	Psammechinus miliaris							R				
ZB036	Echinus esculentus							O				
ZB038	Echinocyamus pusillus		1									
	Hemichordata (Class Ascidia)											
ZD000	Clavelina lepadiformis							O	O	O		
ZD013	Corella parallelogramma							O				R
ZD014	Ascidiella aspersa							1				
ZD014	Ascidiella scabra							C		O		
ZD015	Ascidia mentula							R				
ZD019	Dendrodoa grossularia											1
ZD125	Botryllus sp.							O				
	Chordata (Class Chondrichthyes)											
ZF084	Raja sp. (Not listed)								P			
	Chordata (Class Osteichthyes)											
ZG037	Syngnathus sp.									1		
ZG068	Pholis gunnellus							R				
ZG070	Callionymus lyra			P		O	P	O	P	P		
ZG074	Pomatoschistus minutus									O		
ZG087	Pleuronectidae indet			P								
ZG090	Pleuronectes platessa						P					
ZM002	Rhodophyceae indet (							O				

		JN 298 D1	JN 298 D2	JN 298 D3	JN 298 D4	JN 298 D5	JN 298 D7	JN 298 D8	JN 298 D9	JN 298 D10	JN 298 D11	JN 298 D12
ZM038	Corallinaceae sp.							O				
ZM061	Chondrus crispus							O				
ZM095	Delesseria sanguinea							O				
ZR062	Chorda filum									F		
ZR063	Laminaria saccharina									O		
ZS024	Ulva sp				O							
ZL 000	Beggiatoa sp.									R		