moray offshore renewables ltd

Environmental Statement

Technical Appendix 4.2 A - Benthic Ecology Characterisation Survey (Wind Farm Sites)

Telford, Stevenson, MacColl Wind Farms and associated Transmission Infrastructure Environmental Statement

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1. Introduction

1.1. Study Background

1.1.1. Following successful award of exclusive development rights from Crown Estate, Moray Offshore Renewables Ltd. (MORL) (a consortium developer comprising EDP Renovaveis and Repsol Nuevas Energias UK (formerly SeaEnergy Renewables)) commissioned a series of detailed technical studies to support a consent application and associated Environmental Statement (ES) for the three proposed wind farm sites, Telford, Stevenson and MacColl (eastern phase of the Moray Firth Round 3 offshore wind farm zone).

1.1.2. Information derived from these studies will be used to inform the Environmental Impact Assessment (EIA), with respect to predicted effects of the construction, operation and decommissioning of the wind farm and to assist in the development of mitigation measures where agreed and appropriate. This will aid in the development of the Environmental Statement (ES) in support of the consent application.

1.1.3. To address these aspects, EMU Limited (EMU) was commissioned to undertake a benthic ecology sampling survey of the proposed turbine array site. Accordingly this document presents the survey methods used, the data collected and gives a characterisation of the subtidal benthic environment within and around the proposed development in terms of the seabed habitats available and their influence on associated biological communities. Similar benthic studies relevant to the export cable route and landfall site have been undertaken and reported separately but will also be used to underpin EIA.

1.1.4. As a preliminary stage in informing the benthic habitat/species survey, described here, an important component of the data acquisition process is clarification of the benthic ecology (comprising habitat, species and communities) of the three wind farm sites (eastern phase of the zone) and local surrounding areas using pre-existing research and commercial reports. In relation to this work, a benthic data review was undertaken (Emu Ltd. 2010) which identified previous studies, data sources and gaps.

1.1.5. Subsequent to the review, site specific sampling within and around the three wind farm sites (eastern phase of the zone) (Fig. 1.1) was undertaken to ensure adequate coverage of seabed habitat conditions and communities relevant to the proposed offshore wind farm development. The findings of comparable sampling studies and intertidal survey along the export cable route and landfall site have been reported separately and will form part of the Offshore Transmission Infrastructure EIA. The results of the export cable studies will also be taken into account within the cumulative impact assessment of the Offshore Generation Station (i.e. wind farm) EIA.

1.2. Aims of the study

1.2.1. Study aims included;

- Characterisation of benthic ecological conditions specific to the site and the predicted impacts of the three proposed Moray offshore wind farm sites (eastern phase) to inform the EIA.

1.3. Study Overview

1.3.1. The Moray wind farm zone is located approximately 22km from the coast on the Smith Bank in the outer Moray Firth. It covers an area of just over 522 km^2 (Figure 1.1). Water depths are relatively shallow, and sediments are described as largely homogenous sandy material. Waters in the region may be vertically mixed (non-stratified) resulting in little differential between surface and bottom thermal regime, thus seabed fauna may be exposed to comparatively wide ranging surface water temperatures. Associated fauna are within a distinct central and northern North Sea benthic assemblage.

1.3.2. The northwest boundary of the proposed development abuts the proposed Beatrice Scottish Territorial Waters (STW) proposed offshore wind farm (Figure 1.1). Response from Marine Scotland (MS) was given under the Electricity Works (Environmental Impact Assessment) (Scotland) (EIA) Regulations 2000. In this MS gave general guidance on format and documentation to be referred to for the Environmental Statement (ES). In addition, collaborative working with other developers in the region was encouraged to ensure cumulative issues within the immediate and wider region are considered.

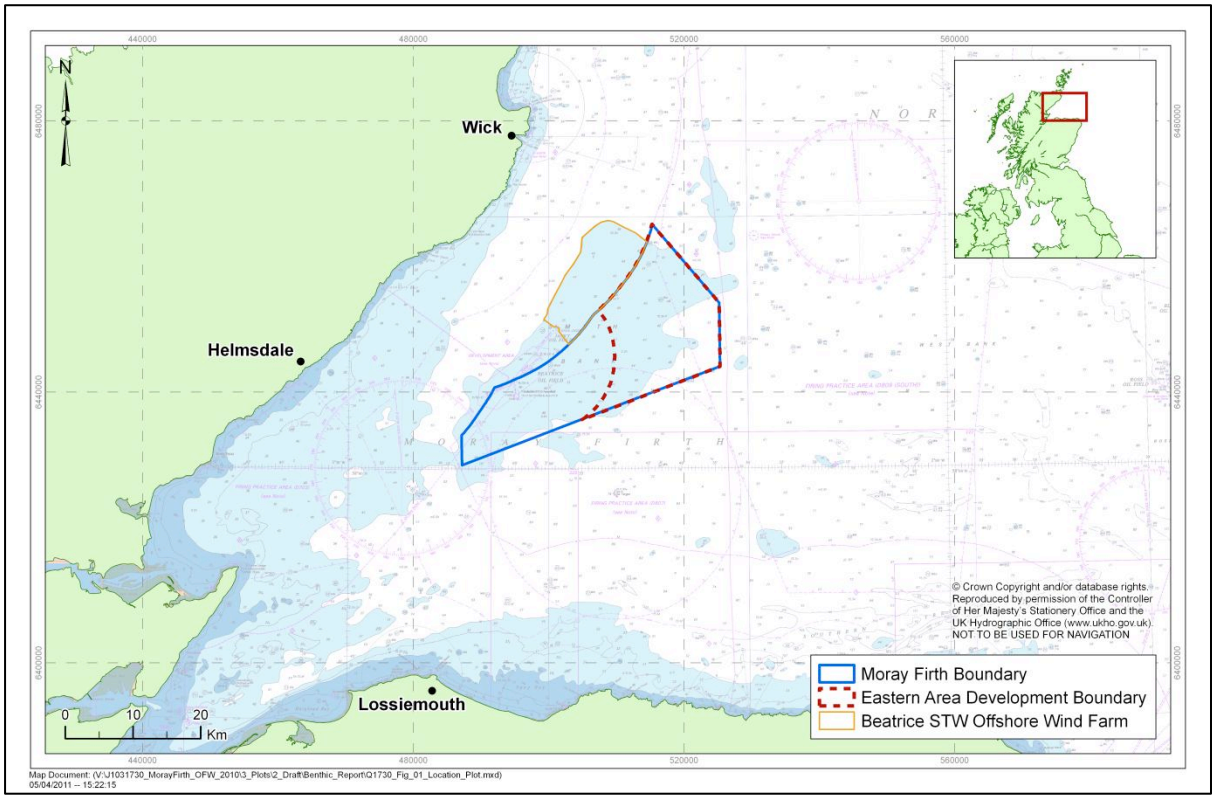

Figure 1.1: Location of the Moray Firth offshore wind farm zone.

1.3.3. Further to the above, specific comment on benthic ecological aspects was made. This was largely concerned with the use of rock armour/stabilisation material as a defence for wind turbines and considered that this will need to be taken into account in terms of a change to the natural habitat. An early analysis opinion was recommended to facilitate any decisions on further survey work and/or change in survey design. If possible, it has also been requested that the final wind farm layout be overlain on to recorded benthic biotopes demonstrating that "*benthic interests*" have been considered.

1.4. Regional Physical Environment

1.4.1. Physical information on the Moray Firth is largely summarised from Adams & Martin (1986). Water depth is recorded at less than 80 m with the shallowest occurring at Smith Bank coincident with the Round 3 wind farm zone; circulation patterns are clockwise with weaker summer flows due to reduced wind forcing. Tidal currents across the Round 3 zone reach a maximum of 2 knots during mid flood and mid ebb occasions with the principal currents aligned along a north-east / south west axis.

1.4.2. The shallow profile is reflected in the generally well mixed water profile with winter and summer surface and bottom temperatures fluctuating between roughly 7^0C and 12^0C; note that summer surface temperatures may be 1 – 1.5^0C higher. Surface and bottom salinity levels are relatively consistent throughout the year fluctuating in the outer Firth between 34.8 and 35.0 parts per thousand.

1.4.3. The Moray Firth is described as an "*open system*" being an integral part of the wider North Sea thus having common environmental factors. Moray Firth benthic sediments, considered as moderately to well sorted, fine to medium grained, with some shell, are described as "*relatively homogeneous*" with a general minimum phi grain size of 3.23 and a maximum of 5.56 (Pinn and Robertson, 2001). Suggestions are that sediments are not of fluvial origin, but rather are derived from offshore marine transport, with some reworking of fluvioglacial material by marine erosion (Reid and McManus, 1987).

1.4.4. The predicted distributions of principal seabed habitats have been modelled from existing data and mapped by the Mapping European Seabed Habitat (MESH) project and are shown in Figure 1.2. These distributions are taken as the current view but classifications and boundaries will be subject to change and future refinements through the addition of more survey observations outside of the current EIA process.

1.4.5. Detail of the predicted MESH habitat map covering the development area is presented showing a number of principal sediment habitat types within and around the Moray Firth zone (Fig. 1.2).

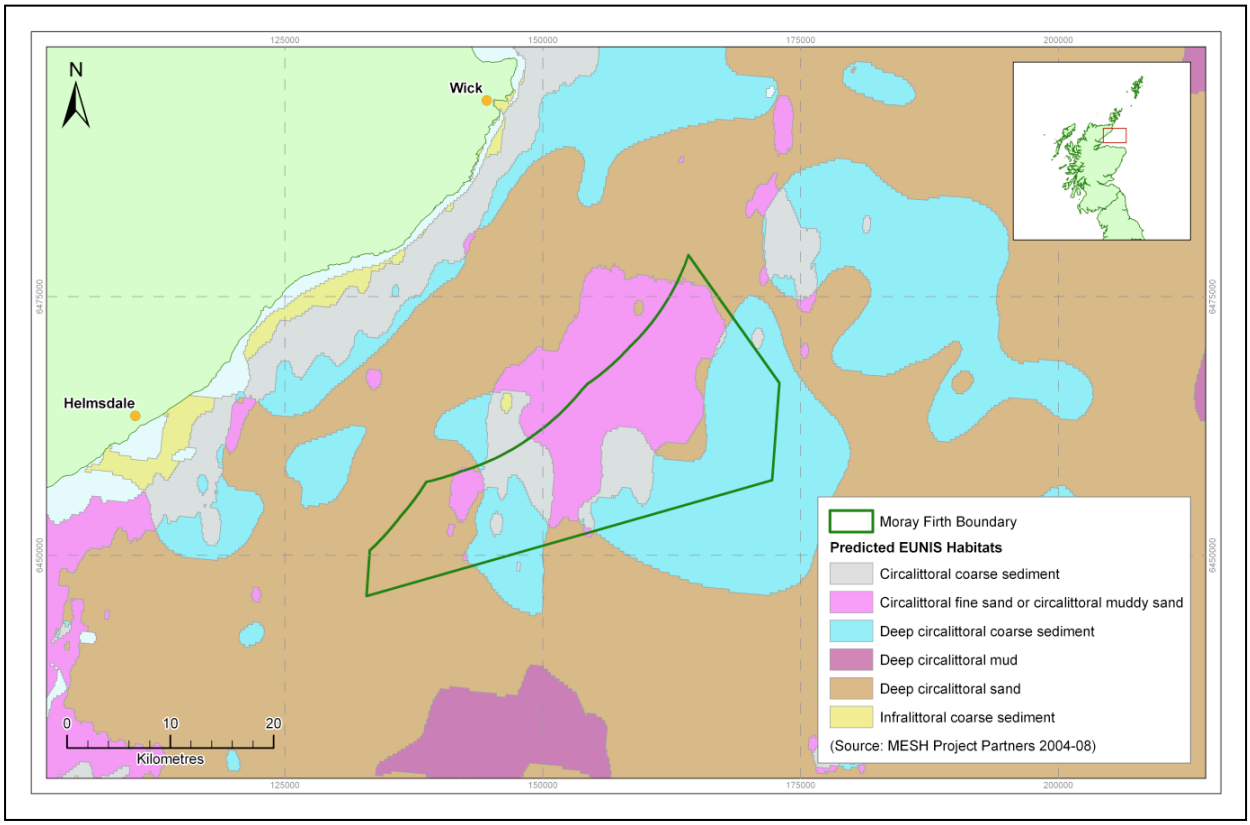

Figure 1.2: Predicted MESH habitats in the Moray Firth study area (Source: www.searchmesh.net)

1.4.6. Glémarec (1973) describes the sediments of Smith Bank as comprising coarse and medium sands which support a typical fauna including the pea urchin *Echinocyamus pusillus*, the bivalve *Tellina pygmaea,* and the polychaetes *Travisia forbesii* and *Ophelia borealis*. At the base of the bank Glémarec (1973) also describes a small channel in waters >60 m depth supporting the mud community of sea pen *Virgularia mirabilis* together with the polychaetes *Anobothrus gracilis* and the bivalve *Nucula tenuis*. A later review (DTi, 2004) broadly supported the previous work on Smith Bank and described the shallow (40 m) seabed and substrate of relatively coarse sand / shelly gravel and occasional rock outcrops.

1.4.7. In the region a strong correlation between sediment distribution and depth was demonstrated (Hartley & Bishop, 1986). Coarser sediments were associated with shallower areas to the east of the Beatrice Oil field survey grid whilst finer grained sediments occurred in deeper water to the west. Levels of silt/clay in shallow water areas (up to 40 m) were found to be consistently low across survey area (<2.5%) although these increased to 5% in depths of between 40 and 50 m. Sediment in deeper water areas >50 m contained silt/clay levels of between 5 – 15%. Organic matter content of the sediments was related to the silt/clay content and ranged between 0.07% and 2.54%.

1.4.8. Gravel levels were locally variable, possibly attributed to patchy shell/gravel deposits and Hartley & Bishop (1986) commented that given the uniform distribution of live molluscs across the site, that the dead shell accumulations may represent periglacial

relicts.

1.4.9. Historic acoustic surveys at the Demonstrator site (Talisman, 2006) revealed fine grained sediments to the north-west and south-east of the site whilst coarser sediment predominated to the north-east. It was noted that the seabed sediment types exhibited little variation over the site with no anomalies or interest features identified. Seabed video showed a clean fine sand substrate with broken shell material consistent with Hartley & Bishop's (1986) earlier description.

1.4.10. More recently, acoustic survey data have been collected for the current wind farm zone as part of the series of technical characterisation studies to support the ES. This showed distinct sediment acoustic regions the distributions of which are presented in (Figure 1.3).

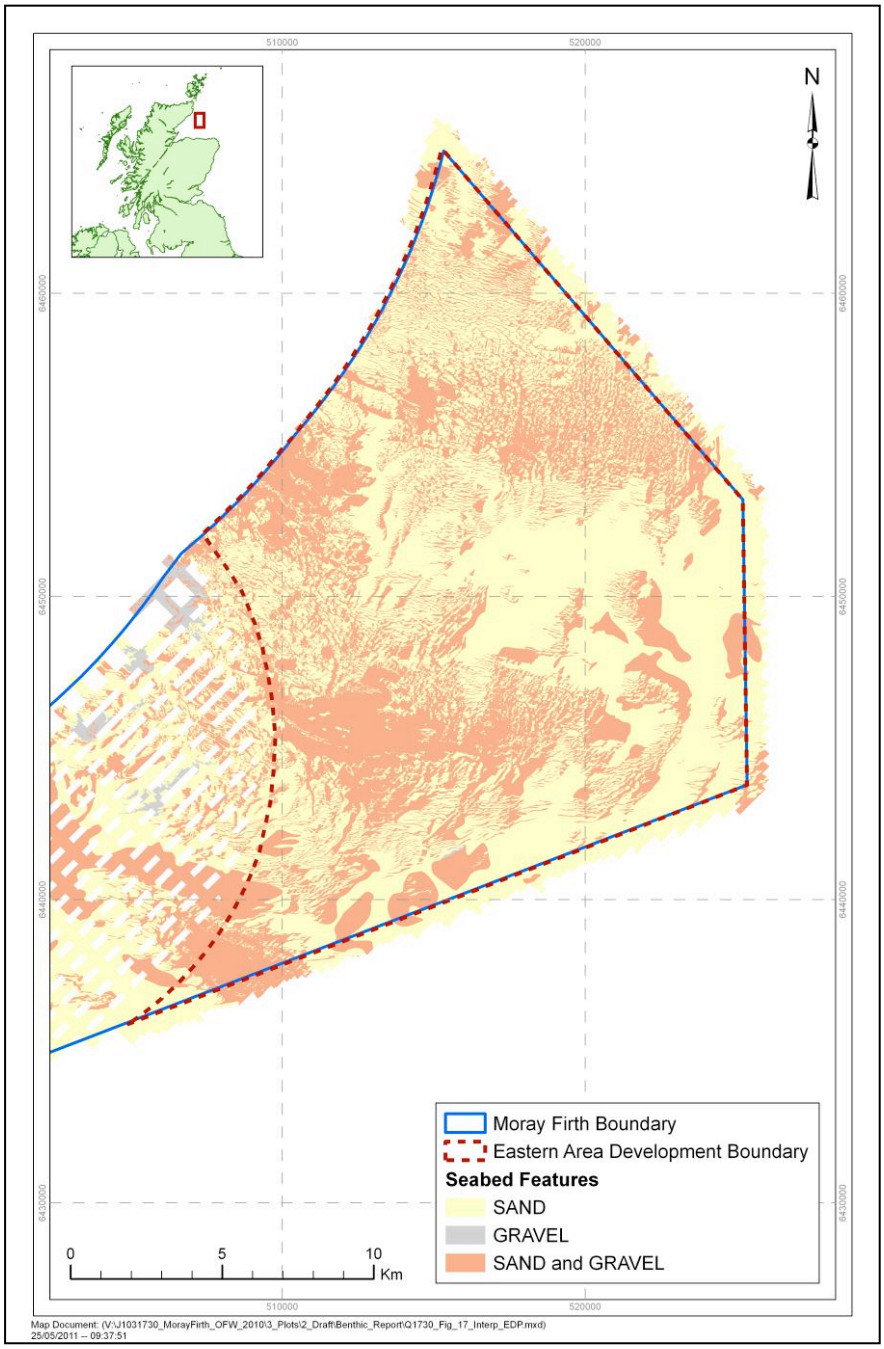

Figure 1.3: Seabed sediment interpretation from acoustic survey

1.5. Regional Biological Context

1.5.1. In the Moray Firth region Künitzer *et al*. (1992) identified discrete, predominately deep water coarse sediment infaunal assemblages including polychaetes (*Ophelia borealis*, *Exogone hebes, Spiophanes bombyx, Polycirrus* spp., *Minuspio* spp. *and Aricidea* spp.), bivalves (*Thyasira* spp.) and brittlestars (*Amphiura filiformis*). These assemblages have also been noted in the northern and central North Sea.

1.5.2. Whilst the above considers broad scale infaunal communities, it was also noted that a characteristic mobile deep water epibenthic North Sea community overlays the

infaunal assemblage (Dyer *et al.*, 1983; Jennings *et al.*, 1999; Rees *et al.*, 1999 and Callaway *et al.*, 2002). Typical species include the common starfish *Asterias rubens*, burrowing starfish *Astropecten irregularis* and sea urchins *Echinus* spp., crustaceans (e.g. *Crangon allmanni*, *Pagurus bernhardus, Anapagurus laevis* and *Hyas coarctatus*), the gastropod *Neptunea antiqua* and sessile colonial species (e.g. *Alcyonium digitatum*, *Suberites domuncula*, *Hormathia digitata*, *Epizoanthus incrustatus, Clytia hemisphaerica)*.

1.5.3. With regard to mobile demersal fish species, the area was also characterised by an assemblage recorded from scientific and commercial trawls (Callaway *et al.*, 2002; Reiss *et al*., 2010). For this the Moray Firth is typified by a wider regional assemblage comprising of whiting (*Merlangius merlangus*), dab (*Limanda limanda*), haddock (*Melanogrammus aeglefinus*), lemon sole (*Microstomus kitt*), plaice (*Pleuronectes platessa*), grey gurnard (*Eutrigla gurnardus*), herring (*Clupea harengus*) and American plaice or long rough dab (*Hippoglossoides platessoides*).

1.5.4. The data support the notion of a rich and diverse local macrofauna. Hartley & Bishop (1986) remarked that faunal densities at sample stations at the Beatrice Field were two times higher than those at offshore areas in the North Sea and attributed overall high species numbers to the variety of different sediment types sampled. They further suggested that given the rich and diverse fauna present, major seabed disturbance is infrequent.

1.5.5. The United Kingdom Offshore Operators Association (UKOOA) datasets show that 543 species were recorded at the Beatrice oil field between 1980 and 1992. Mean species numbers per station were between 50 and 86 (Figure 1.4) and peaked at the Captain Field, west of the current study area. These values broadly compare with those recently recorded at the Beatrice wind turbine demonstrator project site (98 – 106 species per sample station) (Talisman, 2006).

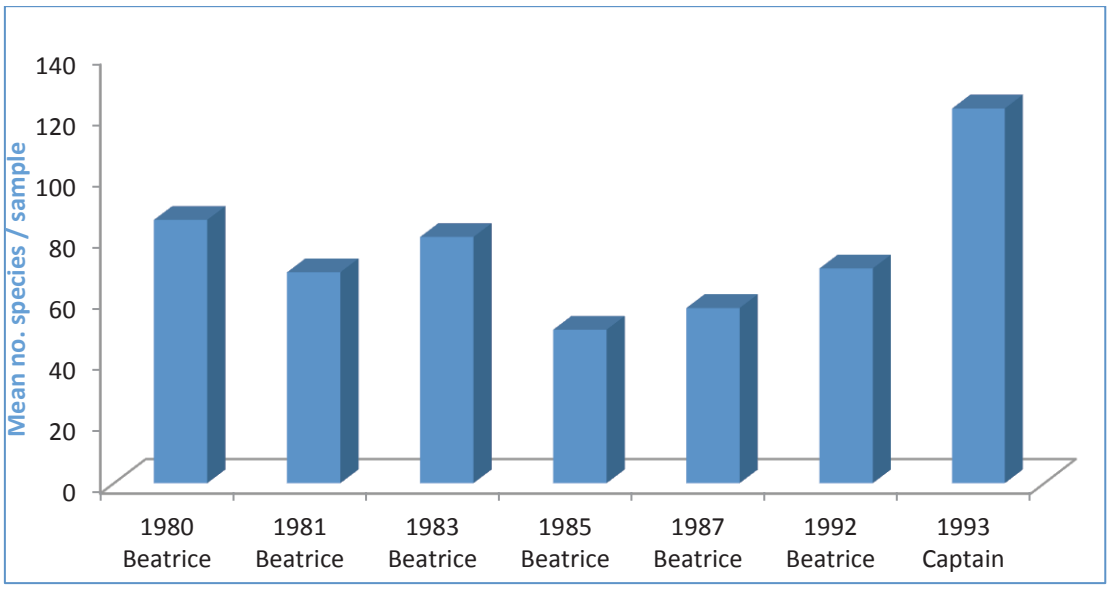

Figure 1.4: Mean species numbers per sample recorded between 1980 and 1993 at the Beatrice and Captain oilfields (source: UKOOA database v3.1)

1.5.6. Summarising the Beatrice baseline datasets, Hartley and Bishop (1986) calculated that Annelida (segmented worms) were the dominant phylum (numbers and species) at Smith Bank. These typically comprised 40% of total species variety in samples whilst molluscs comprised 30%, crustaceans 20%, miscellaneous taxa 10% and echinoderms 5%.

1.5.7. Multivariate grouping of the available UKOOA data (mean abundance data) (Figure 1.5) shows the presence of a discrete faunal community at the Beatrice site, distinct from the Captain site. Typical species of the Beatrice community include the polychaetes *Spiophanes bombyx, Pholoe baltica,* cirratulids*, Scoloplos armiger, Nephtys* spp.*, Spio filicornis, Lumbrineris* spp.*, Diplocirrus glaucus* and *Goniada maculata,* bivalves *Cochlodesma praetenue, Tellina* (*Fabulina*) *fabula, Abra prismatica, Crenella decussata, Gari fervensis* and amphipods *Bathyporeia* spp. and *Urothoe elegans.*

1.5.8. The proximity of the annual groupings to each other (see Figure 1.5) suggests that macrofaunal communities at Smith Bank are temporally stable with little variation in composition between years. The limited variation that is apparent was related to variations in the abundance of characteristic taxa including *Chaetozone* spp.*, S. bombyx, Thyasira* spp.*, Thracia* spp.*, Ophiura* spp.*, A. prismatica*, and the reduced abundance of *Capitella capitata, T. fabula, C. praetenue, Ophryotrocha* spp.*, Lumbrineris gracilis* and *Virgularia mirabilis*.

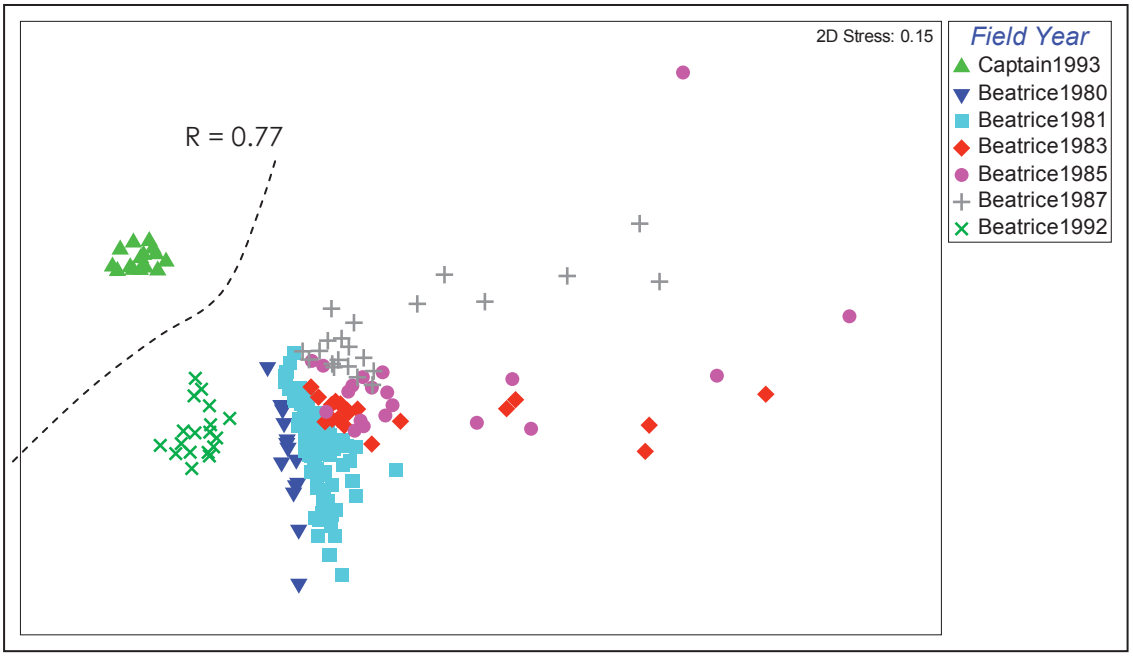

Figure 1.5: Multiple dimensional scaling (MDS) ordination of macrofaunal sample data (mean abundance) (sq rt transformed) collected over several years at the Beatrice and Captain oil fields, outer Moray Firth.

1.5.9. The Beatrice wind farm demonstrator project recorded a rich and diverse sediment fauna numerically dominated by polychaetes with crustaceans and molluscs (Talisman, 2006). Conspicuous infaunal species included the polychaetes

Chaetozone setosa, L. gracilis and *Exogone hebes* together with the amphipods *U. elegans, Ampelisca tenuicornis* and *Bathyporeia* spp., the bivalve *T. fabula* and the pea urchin *Echinocyamus pusillus*. Epibenthic communities were characterised by sponges, the erect bryozoan *Flustra foliacea*, the anemone *Bolocera tuediae* and the crab *H. coarctatus*.

1.5.10. Other epibenthic organisms have been described by Picken (1986) during investigations into the fouling organisms on artificial structures in the Moray Firth including those within the Beatrice Field. Structures were initially colonised by barnacles *Balanus balanus, B. balanoides* and *B. crenatus* and tubeworms *Hydroides norvegica* and *Pomatoceros triqueter* within the first year of placement. Over the following two - three years, these became overgrown with blue mussels *Mytilus edulis* together with growths of seaweeds in the uppermost 5 m of water. These growths were succeeded after four years by hydroids *Obelia* spp., *Tubularia* spp. and *Nemertesia ramosa* which dominated surfaces below the seaweeds together with the soft coral *Alcyonium digitatum* and the ascidian *Ascidiella aspersa and Ciona intestinalis*. These species can be seen as migrants into the area that were not typical of the benthic assemblages recorded pre-development.

2. Methods

2.1. Survey Design

2.1.1. Survey specifications, sample analyses and data analyses were agreed with Marine Scotland prior to mobilisation to ensure statutory requirements were addressed. Methods were also aligned with those undertaken during concurrent benthic survey at the Beatrice Scottish Territorial Waters (STW) offshore wind farm which abuts the current development site to the north west (see Figure 1.1). Compatibility in data acquisition and analyses techniques between the two surveys was encouraged by Marine Scotland to benefit assessment of the wider ecological context and permit robust assessment of potential cumulative effects on the benthic ecology in this area of the Moray Firth.

2.1.2. EMU undertook the subtidal sampling of the benthos including grab and trawl sampling and seabed video. Sampling methods followed standard guidelines (Boyd, 2002 (now updated see Ware & Kenny, 2011) and Cefas, 2004). The macro-invertebrate and sediment contaminants analyses were undertaken at accredited sub-contracted laboratories under EMU management. Quality checks on macrofaunal taxonomical analyses were performed by EMU. The sediment particle distribution analysis was undertaken at EMU's UKAS accredited sediment laboratory. All methods employed by EMU conformed with in-house operating procedures and/or ISO9001 control procedures where appropriate and are described below.

2.1.3. Table 2.1 summarises sampling effort. The array comprised 88 sample stations for collection of grab samples and seabed video data. A single grab sample was collected at each station; data on substrate and community heterogeneity were derived from the seabed video. At 10 of these stations an additional small 0.1 m^2 Day grab sample was collected for analysis for sediment contaminants. Further to this, 21 2 m beam trawl samples were also collected to assess larger, more mobile assemblages such as crab, prawns and fish.

Table 2.1: Summary of sample stations.

Sampling techniques	No. stations	Purpose
Seabed digital video and stills photography	88	Collection of seabed images to inform habitat and epifaunal community assessment.
0.1 m^2 Hamon grab	88 (single replicates)	Collection of quantitative sediment samples for faunal and sediment analysis, for habitat and community assessment.
2 m beam trawl	21	Collection of qualitative samples for assessment of assemblages of mobile epibenthos.

0.1 m^2 Day sampling	11	Collection of seabed sediment samples for contaminants analysis.

2.1.4. Figure 2.1 presents the benthic sample survey array. Grab sampling stations were selected on a stratified random basis with consideration to previously acquired geophysical (acoustic) data and predicted impact types. This ensured adequate coverage of both the sediment habitats present and any associated direct and indirect impacts on benthos anticipated.

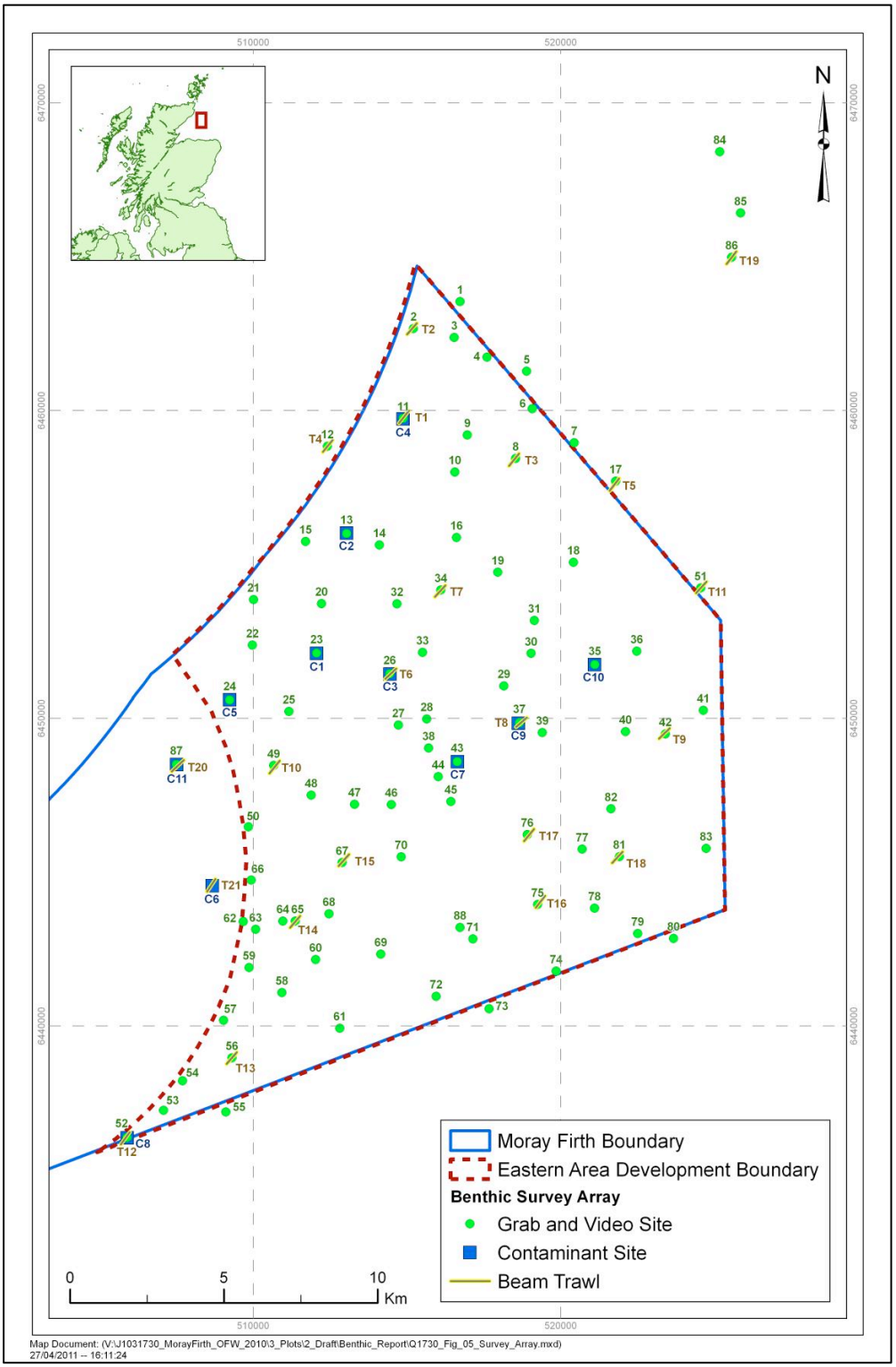

Figure 2.1. Benthic ecology sample array

2.1.5. Seventy four grab and drop down video sample stations and sixteen 2 m beam trawls were positioned within the boundaries of the three proposed wind farm sites (Eastern Development Area). These sample locations were intended to acquire habitat and species data from areas predicted to be subject to primary or direct impacts of

development. Primary impacts may include loss of habitat as a result of the placement of turbines and substation platforms on the seabed as well as direct physical seabed disturbances from laying of the inter-turbine cables and contact with the seabed from the feet of jack-up rigs.

2.1.6. A further eleven grab and drop down video sample stations were positioned around the periphery of the licence area to collect habitat and species data from areas potentially subject to secondary or indirect effects of the development. Secondary effects may occur as a result of tidally driven transport of fine sediments disturbed by construction activities and their re-settlement on the seabed beyond the boundaries of the turbine site. Effects may include smothering of sessile epifauna and/or damage to sensitive feeding or respiratory apparatus.

2.1.7. Three grab and drop down video sample stations were selected outside the predicted primary and secondary effects of the development. These samples were intended to act as reference locations during subsequent monitoring campaigns to record the natural change in benthic conditions against which any change within the primary and secondary areas could be assessed.

2.2. Sampling Survey

2.2.1. The benthic ecology survey was conducted over seven days (11/10/10 – 17/10/10). All survey work was undertaken on board EMU's survey vessel MV Shannon. Grab and seabed video sampling coordinates and field observations are provided in Appendix I. Sample positioning including grabs, trawls and seabed video was achieved using EMU's Hemisphere Crescent V100 DGPS which has a stated horizontal accuracy of <0.6 m (95% confidence). Navigation and position recording was achieved using Trimble's HYDROPro software version 2.30.844.

Subsea video

2.2.2. Prior to deployment of the grab, the seabed at each sample location was initially surveyed using a digital video and stills camera mounted within a drop-down frame. A minimum of five minutes seabed video footage was collected at each station together with a minimum of five photographic stills. Representative seabed photographs for each sample station are presented in Appendix II.

2.2.3. Observer records were collated throughout each five minute video deployment including substrate type and conspicuous epifauna together with any observations of burrows and tubes, (i.e. *Nephrops* burrows, see Pinn and Robertson, 2001).

2.2.4. No Annex I features, which may have precluded the subsequent intrusive grab sampling, were identified from the video. Data for a limited number of sample stations comprising harder coarse seabed were collated and compared against Annex I reef criteria (Irving, 2009) and submitted to Marine Scotland / JNCC for statutory opinion as to nature conservation status. It was subsequently confirmed by JNCC that "*the seabed habitat recently sampled at the proposed Moray Firth Round 3 Zone 1 offshore wind farm does not constitute Annex 1 stony reef*" (Paine, *pers. comm.*, 2011). Criteria applied for the determination of resemblance to Annex I stony reef followed guidelines provided in Irving (2009).

Grab sampling

2.2.5. Following recovery of the seabed video, a quantitative seabed sample was collected using a 0.1 m^2 mini-Hamon grab. Grab samples were successfully collected at all stations with the exception of station 20 where the very coarse and hard nature of the seabed was not amenable to grab techniques. A further five samples stations (stations 18, 21, 22, 50, 66) only returned low volumes and contained insufficient material to permit sub-sampling for particle size distribution (PSD) analysis. The total number of grab samples collected was therefore 87 samples for macrofaunal analysis and 82 samples for PSD analysis.

2.2.6. The position of each sample was fixed at the time when the winch wire went slack indicating that the grab was on the seabed. Upon retrieval of the grab sample on board the vessel, excess water was drained from the sample through a 1mm sieve and the sample checked to ensure adequate quality. Samples of five litres and above were considered acceptable. Samples with a volume less than this were generally rejected and the station re-sampled up to a maximum of three times. Where samples of <5 litres were continually achieved then best judgement was used to accept samples of lesser quality.

2.2.7. Once a sample had been accepted it was emptied into a hopper and photographed (Appendix III). The sediment was also described and any conspicuous fauna were recorded (Appendix I).

2.2.8. A sub-sample was taken from the grab sample and placed in a plastic bag for subsequent particle size analysis. The volume taken for particle size analysis depended upon the nature of the sediment (as described in BS1377; part two; 1990) but was generally between 500 g and 1500 g.

2.2.9. The remaining sediment was then gently washed over a 1 mm sieve with the material retained on the sieve transferred into a pre-labelled bucket with lid and preserved with 4% buffered formaldehyde/seawater solution. Buckets were clearly labelled outside plus an extra water proof label with details of date, project number, sample ID and a unique lab reference was added to the preserved sample. These were then stored for return to EMU benthic laboratories for taxonomic analysis.

Contaminants Grab Sampling

2.2.10. Additional seabed sediment samples were collected at 11 of the grab stations for determination of contaminants. Sampling effort focussed on stations closest to the oil and gas activities at Beatrice and on comparatively stable finer grained sediments, which can bind to contaminants. The sediment contaminants targeted included;

- Metals - Arsenic (As) , Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Nickel (Ni), Lead (Pb), Tin (Sn), Barium (Ba), Aluminium (Al)
- PAHs – (16 US EPA Priority Pollutants)
- Total PAH
- Total petroleum hydrocarbons
- Total organic carbon

2.2.11. Sampling of undisturbed sediments was achieved using a 0.1 m^2 Day Grab with stainless steel bucket. Prior to deployment at each station the metal sample bucket of the grab was cleaned with Pentane to ensure that there would be no cross contamination.

2.2.12. Upon retrieval of each sample on board the vessel the sediment was sub-sampled and carefully placed with pre-treated labelled sample jars depending upon the chemical analysis and stored frozen prior to the laboratory testing. In addition a sample of 200 ml was taken for PSD analysis to correspond with the results of the contaminants analysis.

Epibenthic trawling

2.2.13. Twenty-one sites in total were sampled with the 2 m scientific beam trawl fitted with a 5 mm aperture mesh liner (see Figure 2). Each trawl tow was approximately 500 m distance at a speed of 2-3 knots. Start and end of tow lines were fixed within the HydroPro navigation software and appropriate layback applied based on length of warp deployed and water depth. Tows were generally conducted into or across the current. The 2 m beam trawl logs are presented in Appendix IV. A photo log of the trawl samples is presented in Appendix V.

2.2.14. Upon retrieval on board the vessel, the catch was emptied to a large sorting tray and photographed. The catch was then described in terms of its sample volume and conspicuous species. Catches ranged from 6 to 36.5 litres in volume.

2.2.15. Species retained within the catch were identified and enumerated on site with representatives returned to the laboratory to confirm the field nomenclature. All commercial fish species including shellfish were then measured to lowest ½ cm and recorded. Non-commercial species were enumerated or logged as present as appropriate (i.e. sessile colonial epifauna such as bryozoans, hydroids and sponges). Foliose and erect bryozoans and soft corals were weighed on site. Any species which were identified on site were returned to the sea.

2.3. Laboratory methods

Particle Size Distribution (PSD)

2.3.1. PSD analysis was undertaken at EMU's sediment laboratory using in house methods based on BS1377: Parts 1 – 3: 1990 (dry sieving), and BS13320: 2009 (laser diffraction). The latter method was used when the fine fraction of sediment (<63 µm) comprised >5% of the total sample by weight.

2.3.2. Representative sub-samples of each sediment sample were oven dried to constant weight at 105 ±5°C before routinely wet sieving to remove silt and clay-sized particles of <63 µm (unless there was no sample cohesion after drying, where dry sieve analysis only is undertaken). The remaining coarser material was again oven dried to constant weight at 105 ±5°C followed by dry sieving through a series of mesh apertures

corresponding to units as described by the Wentworth scale. The weight of the sediment fraction retained on each mesh was subsequently measured and recorded and merged with the laser diffraction data where appropriate.

Total organic content

2.3.3. Total organic content analysis was undertaken at EMU's sediment laboratory using in-house methods based on BS1377: 1990 Part 3. Representative sub-samples of each sediment sample were oven dried at 50 ±5°C and weighed to constant mass. The sample was subsequently subjected to ignition in a muffle furnace at 440 ±25°C for four hours. The organic matter content was then calculated from the subsequent loss in mass.

Contaminants analyses

2.3.4. Samples for contaminants analyses were sub-contracted to an experienced UKAS accredited chemistry laboratory. Results were compared to standard Cefas and Canadian guideline values to aid assessment of the possible ecological significance of the levels of contaminants found.

2.3.5. Cefas guidelines are represented by a set of non-regulatory Action levels which form part of a wider body of evidence for assessment of disposal of dredged materials to sea. In general, concentrations of contaminants below Cefas Action Level 1 are of little concern with respect to possible effects on the marine environment. Concentrations above Action level 2 however suggest that the material is unsuitable for disposal at sea. Values between Levels 1 and 2 may prompt further investigatory work prior to disposal of the material to sea.

2.3.6. Canadian guidelines are presented in the form of Interim Sediment Quality Guidelines (ISQGs) and Probable Effect Levels (PEL). Generally, concentrations above ISQGs may cause some effects in some sensitive species. Concentrations above the PEL are likely to cause effects in a wider range of species.

Macrobenthic analyses

2.3.7. Analyses of fauna from grab and beam trawl samples were sub-contracted to a NMBAQC participating laboratory. Samples were re-sieved over a 1 mm mesh to remove all remaining fine sediment and fixative. Fauna were sorted from the sediment by elutriation and subsequent examination upon a white tray, with the resultant extracted sediment then sorted by hand under a binocular microscope.

2.3.8. Macro-invertebrates collected from the grab samples were identified to species level, where possible, and enumerated. Colonial, encrusting epifaunal species were allocated a P (present) value. A faunal reference collection was prepared with one individual of each species identified retained.

2.3.9. EMU undertook QC checks on a representative number of whole samples, as well as the entire reference collection in compliance with internal analytical QC criteria.

2.3.10. Faunal biomass analysis was based on a wet-blot method with estimates of ash-free dry weight made based on conversion factors indicated by Ricciardi & Bourget (1998). Mollusc biomass included the weight of the flesh plus shell.

2.4. Data analyses

2.4.1. The macro-invertebrate community structure and sediment distributions were investigated by employing a number of univariate and multivariate statistical measures drawn from the Plymouth Marine Laboratories PRIMER v6 (Plymouth Routines in Multivariate Ecological Research) suite of programs (Clarke & Gorley, 2006; Clarke & Warwick, 2001).

2.4.2. Faunal data were imported into PRIMER and initially subjected to a square root transformation. The transformed data were then subjected to hierarchical clustering to identify sample groupings based on the Bray-Curtis index of similarity. This process combines samples into groups starting with the highest mutual similarities and then gradually lowers the similarity level at which groups are formed. The process ends with a single cluster containing all sites and is best expressed as a dendrogram diagram showing the sequential clustering of sites against relative similarity.

2.4.3. The MDS (Multi-dimensional Scaling) procedure uses the same similarity matrix as that used by the cluster analysis to produce an ordination of sites which is multi-dimensional. This attempts to satisfy all of the between-samples relationships indicated by the similarity matrix. This multi-dimensional ordination is then reduced to a 2 dimensional representation that is a more accessible and useable representation. The representativeness of this 2 dimensional version, in comparison to the multi-dimensional array, is indicated by a stress level. The closer this stress level is to zero, the better the representation.

2.4.4. Sediment data were also imported into PRIMER and normalised and subjected to hierarchical clustering using Euclidean distance as the similarity measure. In addition, Principal Components Analysis (PCA) Ordination analysis was performed on the sediment data.

2.4.5. SIMPER analysis was then applied to the data to rank species in terms of their contribution to both the internal group similarity and "between" group dissimilarity and thereby assist the assessment of the distinctiveness of each community identified and the identification of the characterising taxa. This information is useful for matching with the Marine Habitat Classification System in support of biotope attribution.

2.4.6. Finally, BIOENV was used to assess the abiotic environmental variables which best match the observed clustering of faunal samples following Bray-Curtis and MDS.

2.5. Biotope Classification

2.5.1. Biotope code allocations were made using the current UK Marine Classification System V 4.05 (Connor *et al.,* 2004). Biotopes were allocated to faunal groupings produced from the SIMPER analyses.

2.5.2. Choice of biotope was made using the biotope decision making tool Bioscribe (Hooper *et al.,* 2011). The BioScribe tool matches the species list from a sample to the biological communities usually recorded with potential biotope matches. Confidence indicators and direct links to habitat descriptions from the Marine Habitat Classification for Britain and Ireland are provided to facilitate the process. The tool was used by an experienced ecologist practiced in matching UK biotopes to field survey data with codes applied through expert judgment based on the BioScribe outputs and knowledge of the current biotope classification system. All survey data was used to inform the biotope allocation process including the sediment analyses results and the video ground-truthing data.

3. Results

3.1. Seabed sediments

3.1.1. Full results of the particle size distribution analyses are presented in Appendix VI. Table 3.1 summarises the Folk sediment classifications found (Folk, 1954). Figure 3.1. shows the distribution of Folk sediment classifications overlaid onto the acoustic seabed interpretation.

3.1.2. Grab data revealed three Folk sediment classifications within the study area. These included slightly gravelly sand, gravelly sand and sandy gravel. The six samples not collected by the grab were classified as gravel based on the seabed video evidence (see below).

Table 3.1: Summary of the grab sample sediment data

Folk classification	Number of stations (n=88) Sediment composition	Representative photograph of grab sample
Sand and slightly gravelly sand (S and (g)S)	46 (52 %) Mean % gravel = 0.58 Mean % sand = 97.3 Mean % silt = 2.12	
Gravelly sand (gS)	25 (28 %) Mean % gravel = 7.89 Mean % sand = 89.95 Mean % silt = 2.16	
Sandy gravel (sG)	13 (14 %) Mean % gravel = 34.63 Mean % sand = 62.95 Mean % silt = 2.42	
Gravel (G)	6 (7 %) No psd sample data	

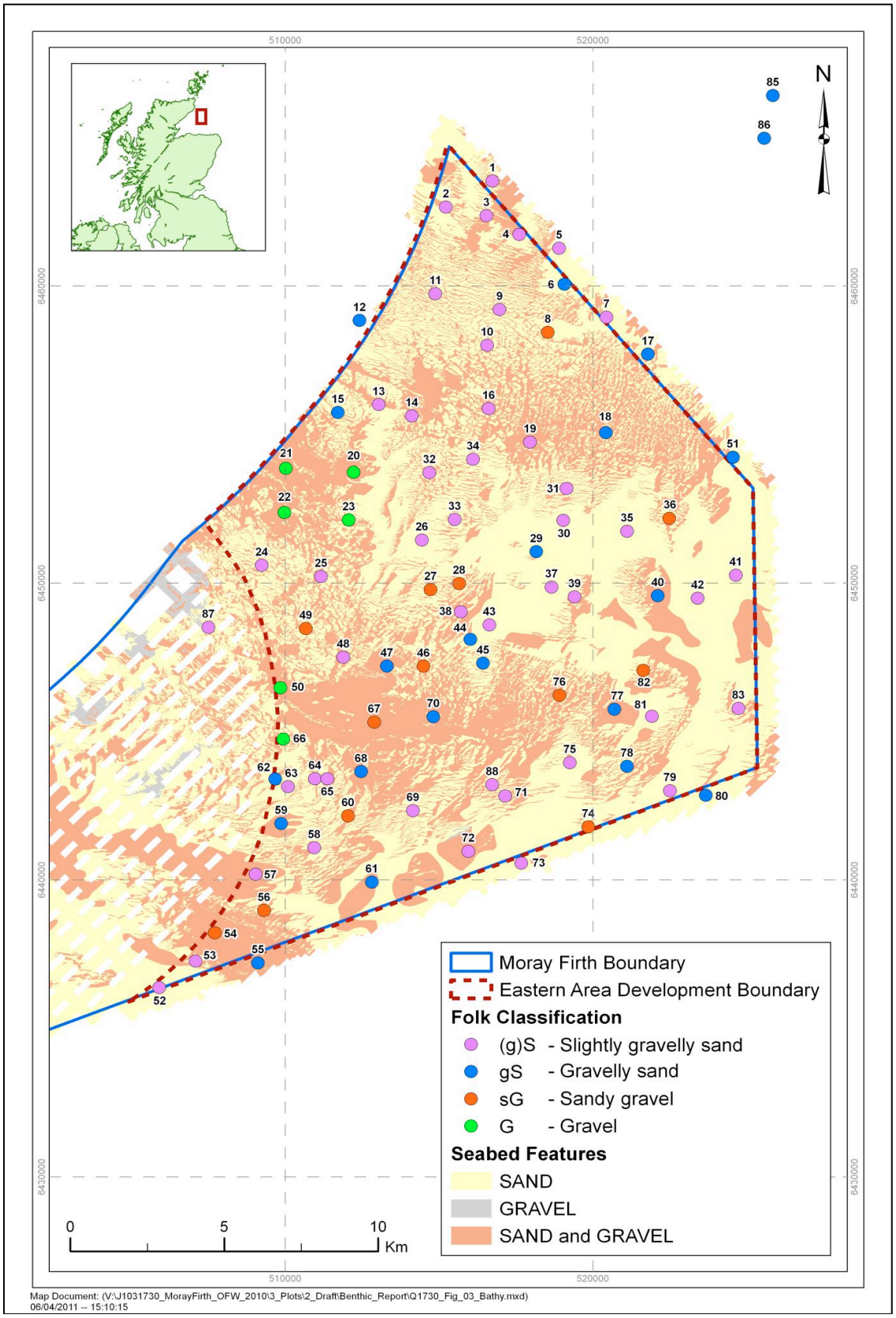

Figure 3.1. Distribution of Folk sediment classifications overlaid onto the acoustic sediment interpretation (note gravel sediments were classified on the basis of video data)

3.1.3. Dominant sediment fractions included fine and medium grade sands (particles of diameter between 125 µm and 500 µm). On average, these sediment fractions accounted for 66 % of the weight of the samples collected. Coarse and very coarse sand (particles of 500 – 1000 µm in diameter) accounted for just 15% of the weight of the samples on average. Levels of fine (silt / clay) particles (<63 µm diameter) were generally low across the survey array (<3%) but increased (around 4% and 5%) with increased water depth to the south.

3.1.4. Field notes recorded varying quantities of shell material within recovered grab samples. Assessment of the shell composition of selected samples showed that in general, 20 – 30 % of the volume of the sediment samples collected comprised shell material reaching 80% - 90% at some locations.

3.1.5. The presence of important quantities of shell material can increase structural complexity of sand substrates, provide settlement and attachment sites for encrusting species and support shell borers, such as some polychaete worms. This can result in a distinctive shell fauna and an enhanced species richness and diversity compared to sediment habitats where shell material is absent or present in lower quantities.

3.1.6. Further investigation of the sediment data, including classification analysis (Euclidean distance measure of similarity and MDS) (MDS ordinations shown in Figures 3.2 and 3.3) demonstrated a clear distinction between slightly gravelly sand sediments and coarser sandy gravels. Gravelly sand sediments appeared to be a transitory sediment group exhibiting intermediate levels of gravel, sand and silt/clay.

Overlying sample treatments onto the same data ordination (Figure 3.3) confirmed no separation between direct, indirect and reference areas. This suggested comparable sediment conditions within and beyond the boundaries of the development and representative reference sediments

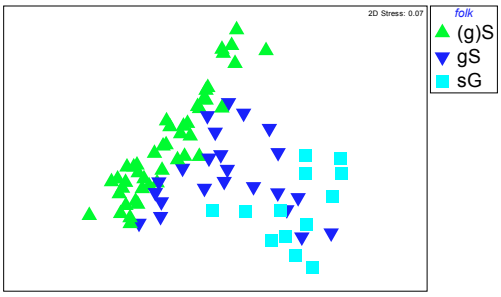

Figure 3.2: MDS ordination of sediment % fractional data based on Euclidean distance and overlaid by Folk sediment classification.

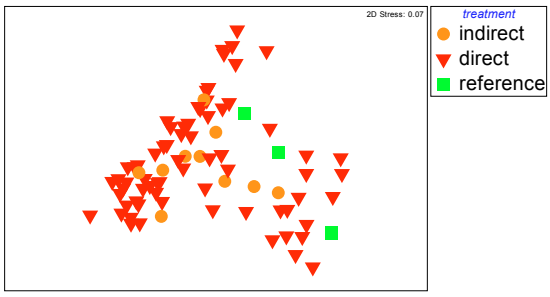

Figure 3.3: MDS ordination of sediment % fractional data based on Euclidean distance and overlaid by treatment area.

3.1.7. Principal Components Analysis (PCA) indicated a number of variables linked to the separation of sediment data (Figure 3.4). For instance, PC1 axis accounted for 33.4% of the variation between samples and was strongly correlated with %gravel (negatively correlated with sand) and sorting. The PC2 axis accounted for a further 23.8% of the variation and was correlated with %fines and depth.

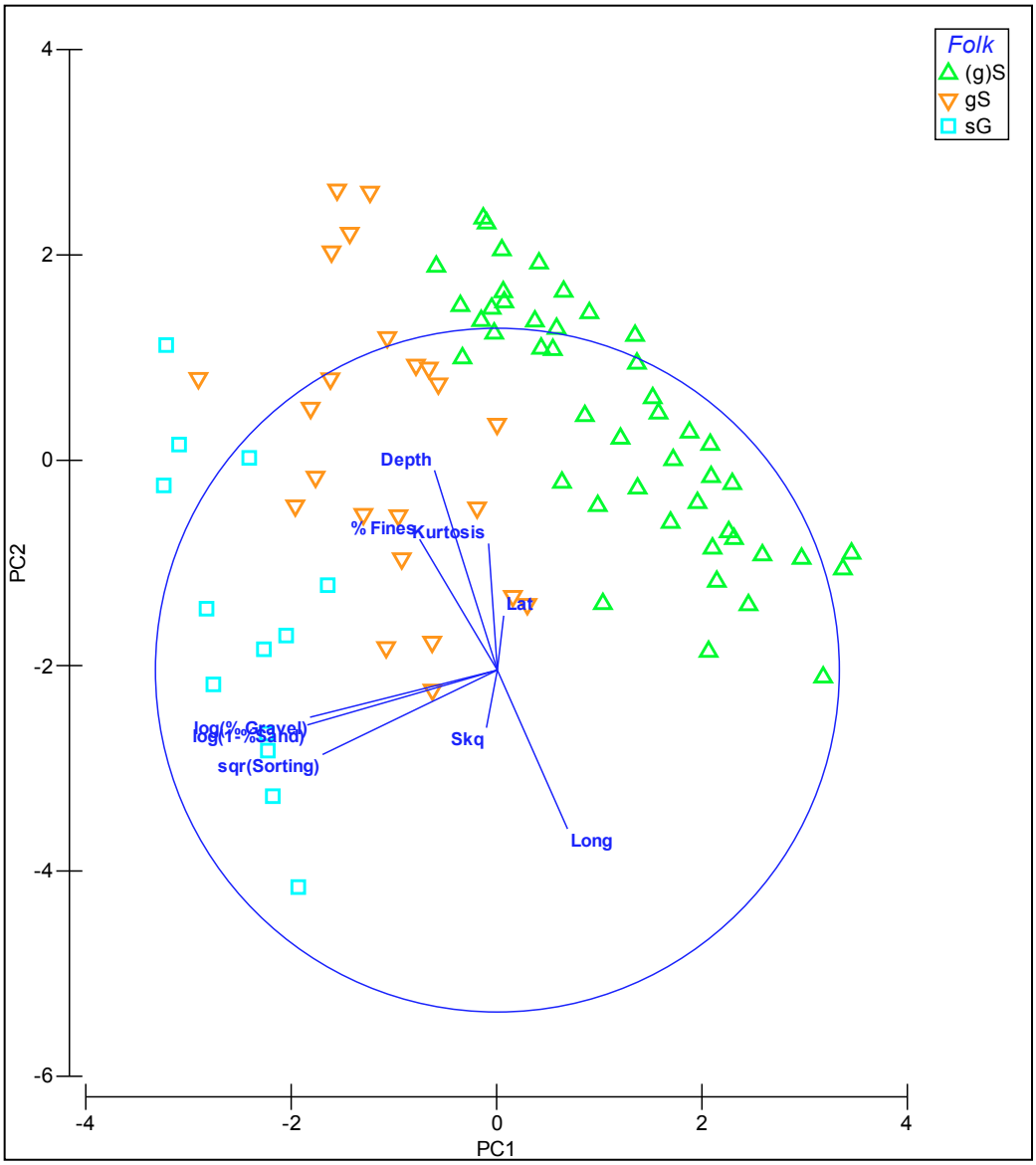

Figure 3.4: Principal components analysis (PCA) ordination of particle size distribution data collected from grab samples. (Selected variables were transformed based on examination of draughtsmen plots and data normalised).

3.1.8. Results of the analyses of sediment contaminants are presented in Appendix VII. Sediment contaminants concentrations were below respective guideline values (Cefas Action I & II and Canadian Interim Sediment Quality Guidelines). No adverse environmental effects are therefore considered likely in this regard.

3.1.9. Organic content of the sediment samples collected was below 0.4% and within the range of levels that have been historically recorded at Smith Bank (Hartley & Bishop, 1986).

3.2. Image data

3.2.1. The video and static images supported the findings of the grab sediment data.

Sediments were manually grouped into four categories broadly corresponding to the Folk classifications described above including sand and slightly gravelly sand, mixed sand, gravel and shell and gravel Full results of the image data are presented in Appendix VIII. Table 3.2 below presents a summary of the video sediment groups.

Sediment habitat type	Characterising epibenthic species	No. locations recorded	Representative seabed image
Sand and rippled sand with burrows and *Echinocardium cordatum* (urchin) tests.	*Asterias rubens* *Astropecten irregularis* *Chaetopterus variopedatus* *Lanice conchilega* *Pagurus bernhardus* *Melanogrammus aeglefinus* *Merlangius merlangus* *Pleuronectiformes* Triglidae	6	
Sand and slightly gravelly sand.	*Lanice conchilega* *Pagurus bernhardus* *Astropecten irregularis* *Echinus esculentus* *Melanogrammus aeglefinus* *Merlangius merlangus* Pleuronectiformes Triglidae	67	
Mixed sand, gravel and shell	*Pomatoceros* spp. Bryozoan crusts *Hydrallmania falcata* Pleuronectiformes *Lanice conchilega* *Calliostoma zizyphinum*	9	
Mixed sand and coarse gravel	*Echinus esculentus* *Asterias rubens* Hydroid turf Bryozoan crust *Pomatoceros* spp. *Munida rugosa*	6	

Table 3.2: Summary of seabed habitat categories identified from video and static image data

3.2.2. The video data (5 - 7 minute transects) revealed a largely homogeneous sand and slightly gravelly sand sediment habitat across much of the site. The surface of the sand was mostly smooth but in shallower locations, it was gently rippled suggesting a small degree of tidal, or wave induced disturbance.

3.2.3. Conspicuous fauna associated with these sandy habitats included tube-dwelling polychaetes such as *Lanice conchilega* and *Chaetopterus variopedatus*, as evidenced by their distinctive tube endings protruding above the seabed surface. Also present were common starfish *Asterias rubens* and burrowing starfish *Astropecten irregularis* and hermit crabs *Pagurus bernhardus*. Haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*) and gurnards (Family: Triglidae) were also commonly observed over these sandy and slightly gravelly sand habitat types.

3.2.4. Deeper water locations (i.e. >55 m) around the periphery of the development were associated with increased levels of fine material and supported the occasional seapen *Pennatula phosphorea* (see example Plate 1). This species is characteristic of the *"seapens and burrowing megafauna in circalittoral fine mud"* biotope (described by Connor *et al.,* 2004) and which is covered under the UK Biodiversity Action Plan (BAP) and Scottish draft Priority Marine Feature (PMF) habitat. However, the general low abundance of seapens across the area together with the apparent absence of associated burrows and mounds and the generally coarser, more mixed nature of the sediment suggested that this was not representative of the biotope and therefore not of significant conservation interest.

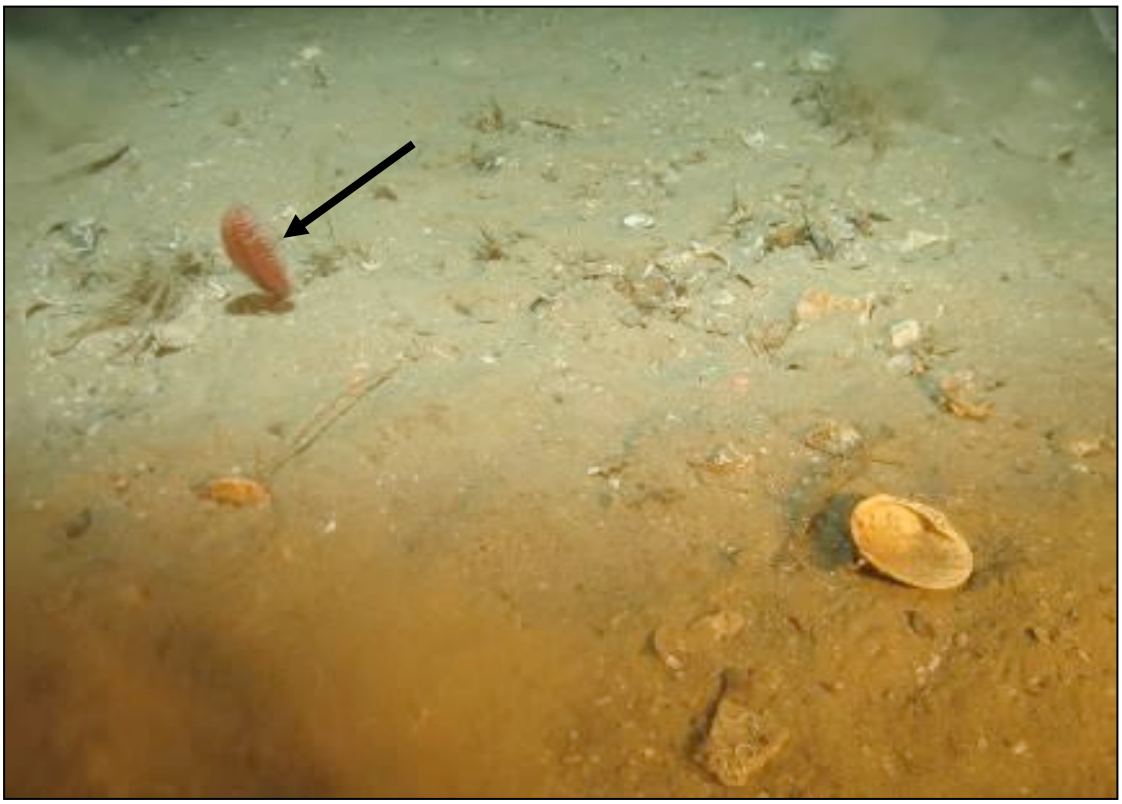

Plate 1. Seabed photo showing circalittoral fine shelly sand with the seapen Pennatula phosphorea (arrowed).

3.2.5. The video footage confirmed that shell material was important in terms of its contribution to the increased complexity of sandy seabed sediments at many locations. This larger material allowed settlement and colonisation by a range of sessile colonial fauna such as bryozoans, hydroids (e.g. *Hydallmania falcata* and *Nemertesia antennina*), boring sponges (e.g. *Cliona* spp.) and encrusting worms (e.g. *Pomatoceros* spp.). Sparse growths of the soft coral *Alcyonium digitatum* and the foliose bryozoan *Flustra foliacea* were also commonly recorded in mixed sandy/shell sediment areas from the video.

3.2.6. Very coarse sediments, i.e. those corresponding to the gravel classifications identified by the grab data above, were characterised by a typical encrusting sessile fauna (bryozoans, hydroids and encrusting worms) together with the edible sea urchin *Echinus esculentus* and the squat lobster *Munida rugosa* (see example image Plate 2). Previous assessment and liaison with Marine Scotland (EMU, 2011) confirmed that this habitat did not fulfil the criteria for an Annex I 'stony reef' so has no particular conservation status.

Plate 2. Example of coarse sediment habitat with the edible sea urchin *Echinus esculentus* in foreground.

3.3. Macrofaunal grab sample data

3.3.1. Appendix IX presents species abundance data for each grab sample. No rare or protected species with respect the EC Habitats Directive and/or the Wildlife & Countryside Act, 1981 were recorded during the taxonomical analysis of the grab samples. The Icelandic cyprine or Ocean quahog *Arctica islandica,* is listed on both the OSPAR List of Threatened and/or Declining Species and Habitats (Region II – Greater North Sea) and the list of Scottish Marine Priority Features. This bivalve species was found singly as juveniles at 9 stations within the three wind farm sites (eastern development area). No adult *A. islandica* specimens were recorded during the survey.

3.3.2. A total of 587 taxa were recorded from the grab samples. Following rationalisation (i.e. removal of algae, meiofauna and pelagic organisms) the total number of taxa was 531. Numbers of species/taxa per sample ranged between 20 and 130 / 0.1 m^2. Abundances ranged between 31 and 878 individuals / 0.1 m^2. The distributions of species numbers and abundance are presented in Figures 3.5 and 3.6 respectively.

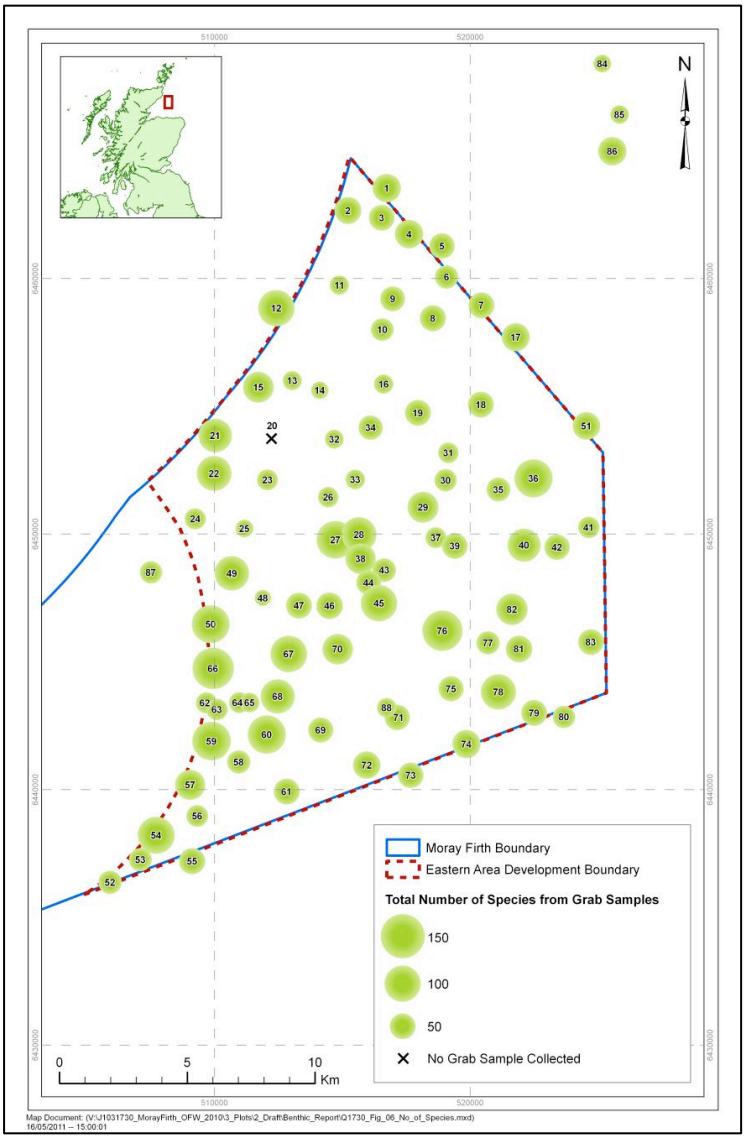

Figure 3.5 Distribution of total numbers of species/taxa per 0.1 m²

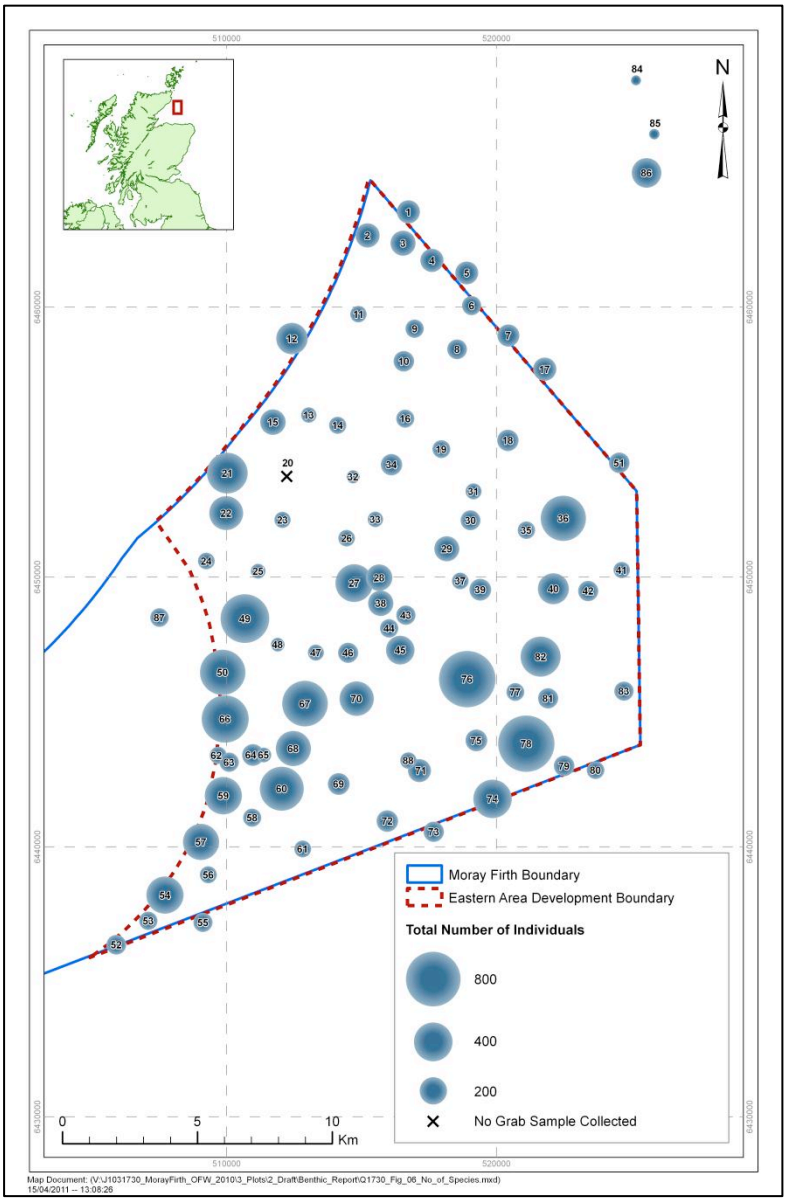

Figure 3.6. Distribution of number of individuals per 0.1 m² across the survey area

3.3.3. Table 3.3 shows the distribution of species amongst the principal macro-invertebrate taxonomic groups (taking into account in the absence of sessile colonial species which were not included in terms of abundance), the data demonstrates the dominance of Annelida (segmented worms) in terms of both species variety (37.1%) and abundance (61.3%). Crustacea (principally amphipods and crabs) were secondarily important in this regard accounting for 20.9% of the species variety and 7.8% of the abundance. Mollusca (principally bivalves) were also well represented and accounted for 18.5% and 14.7% of the total numbers of species and total abundance respectively. Echinoderms accounted for just 5 % and 6 % of the species variety and abundance respectively.

3.3.4. Among the colonial sessile taxa, bryozoans (sea mats) and cnidarians (sea firs and anemones) accounted for around 8% and 5% of the total species variety

respectively.

Table 3.3: Summary of numbers of species in each principal phyla

Taxonomic Group	Number of taxa	% of taxa	No. of individuals	% of individuals
Annelida	197	37.1	10,007	61.3
Crustacea	111	20.9	1,277	7.82
Mollusca	98	18.46	2,392	14.65
Bryozoa	47	8.85	-	-
Cnidaria	29	5.46	-	-
Echinodermata	27	5.08	1,127	6.9
Sipunculida	5	0.94	1,003	6.14
Tunicata	5	0.94	-	-
Others	5	0.94	94	0.58
Chelicerata	3	0.56	19	0.12
Phoronida	2	0.38	140	0.86
Turbellaria	1	0.19	5	0.03
Nemertea	1	0.19	260	1.59
	531	**100**	**16324**	**100**

3.3.5. The most conspicuous species found in the grab samples, in terms of abundance and frequency of occurrence, are presented Table 3.4. These included the polychaete *Chone* sp. as the most abundant species followed by other polychaetes, *Spiophanes bombyx, Pomatoceros triqueter,* Serpulidae, *Polydora caeca, Notomastus* spp., *Hydroides norvegicus* and *Lumbrineris gracilis*. The urchin *Echinocyamus pusillus* and the bivalve *Cochlodesma praetenue* were also comparatively abundant within the current dataset.

3.3.6. Although comparatively abundant, the frequency of occurrence of *P. triqueter, Serpulidae* and *H. norvegicus* and the majority of sessile colonial epifauna was low (present in 21 to 33 % of the samples collected). This is likely to be a consequence of the comparatively reduced availability of coarser sandy gravel and gravel sediments within the study area upon which these species attach. These types of species were, therefore locally abundant but restricted in their distribution to areas of coarser seabed habitats. In contrast, sediment dwellers (infauna), such as *S. bombyx, E. pusillus, C. praetenue, Notomastus* and *L. gracilis*, occurred more frequently as would be expected within a predominately sedimentary habitat.

Table 3.4: Top 10 abundant and frequently recorded species recorded in grab samples

Infauna			Sessile colonial epifauna	
Most abundant species	**Abundance (0.1 m²)**	**No. samples (n=87)**	**Most frequently occurring species**	**No. samples (n=87)**
Chone sp.	1188	33 (37%)	*Eucratea loricata*	58 (67%)
Spiophanes bombyx	866	61 (70%)	*Escharella immersa*	30 (34%)
Echinocyamus pusillus	646	77 (89%)	*Schizomavella auriculata*	29 (33%)
Pomatoceros triqueter	577	21 (24%)	*Scrupocellaria scruposa*	28 (32%)
Cochlodesma praetenue	556	60 (69%)	*Tubulipora*	25 (29%)
Serpulidae	508	28 (32%)	*Hydrallmania falcata*	22 (25%)
Polydora caeca	487	35 (40%)	*Campanulariidae*	22 (25%)
Notomastus	485	55 (63%)	*Entalophoroecia deflexa*	22 (25%)
Hydroides norvegica	423	29 (33%)	ASCIDIACEA (juv)	22 (25%)
Lumbrineris gracilis	411	57 (66%)	*Disporella hispida*	21 (24%)

3.3.7. The results of the biomass analysis are presented in Appendix X. The distribution of phylum level biomass is presented in Figure 3.7. Levels were generally low across the study area with 71 of the 87 stations sampled for fauna returning values of <1 g ash free dry weight (AFDW)/0.1m^2. Among the remaining 16 stations, biomass levels ranged from 1.14 g to 11.61 g AFDW/0.1m^2 (station 60).

3.3.8. Despite only accounting for 18.5% of the species variety and 14.7% of the total abundance, molluscs dominated the biomass contributing to over 64% of the total biomass sampled (note that mollusc biomass included flesh plus shell). Polychaetes and echinoderms were also important in this respect contributing to 16.8 % and 12.2 % of the overall biomass respectively. Crustaceans only contributed to 2.9% of the total biomass recorded indicating the generally small size of crustacean specimens caught in the grabs.

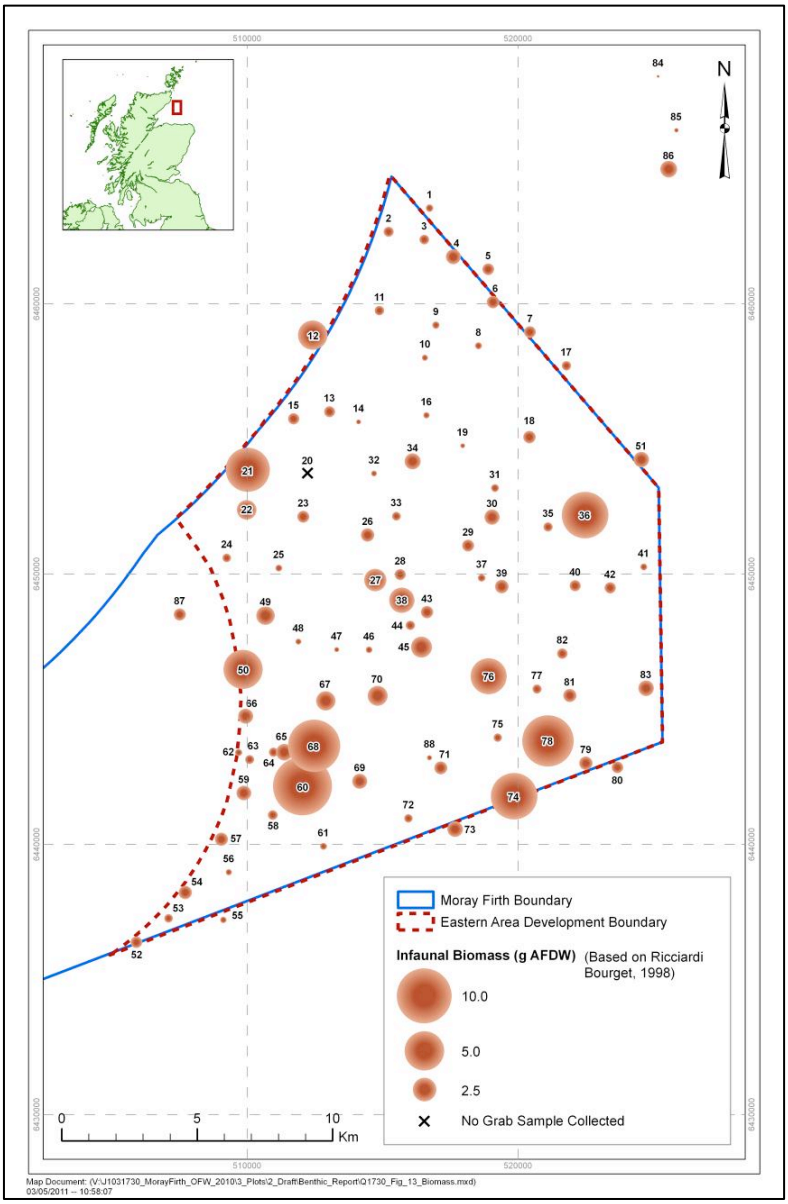

Figure 3.7. Distribution of infaunal biomass g / 0.1 m²

3.4. Multivariate analysis

3.4.1. Multivariate sample sorting of the faunal grab data (Bray-Curtis clustering and MDS) revealed 7 groups (Groups a, b, c, d, e, f and g) (Figure 3.8 and 3.9). The faunal distinctiveness of each of these seven groups was investigated using SIMPER analysis the results of which are given in Table 3.6 together with other group physical attributes.

3.4.2. Note that although the Bray-Curtis clustering (Figure 3.8) incorporated an initial SIMPROF analysis, the results of this were discounted as the resultant number of groupings (total 14) was considered too high for practical assessment purposes. Instead, examination of the group average sorting dendrogram and MDS ordination showed that the samples may be sorted into 7 groups at 30.6 % similarity level. This created a more manageable number of groups for assessment whilst still giving a

reliable picture of biological community structure. Furthermore, comparison with the Habitat Classification System (Connor *et al.*, 2004) and BioScribe (Hooper *et al.*, 2011) showed that each of the 7 groups could be accurately matched with discrete biotopes (see Table 3.6) and so further division of the Bray Curtis groupings was therefore unnecessary with regard to the current study.

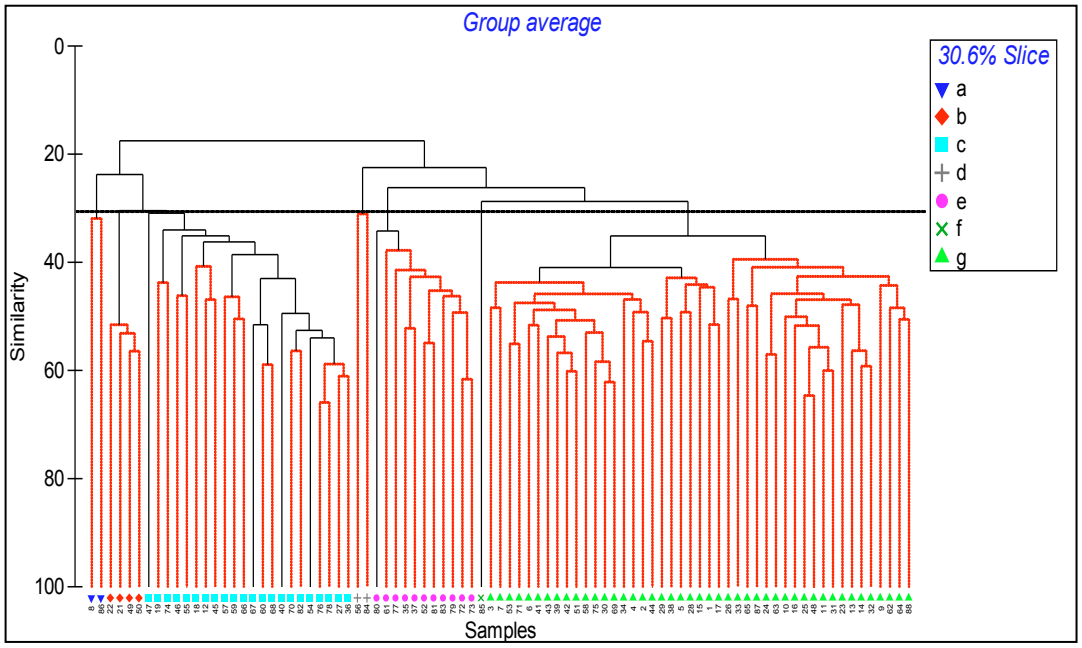

Figure 3.8 Bray Curtis group average similarity dendrogram and associated MDS ordination plot of grab sample data (square root transformed).

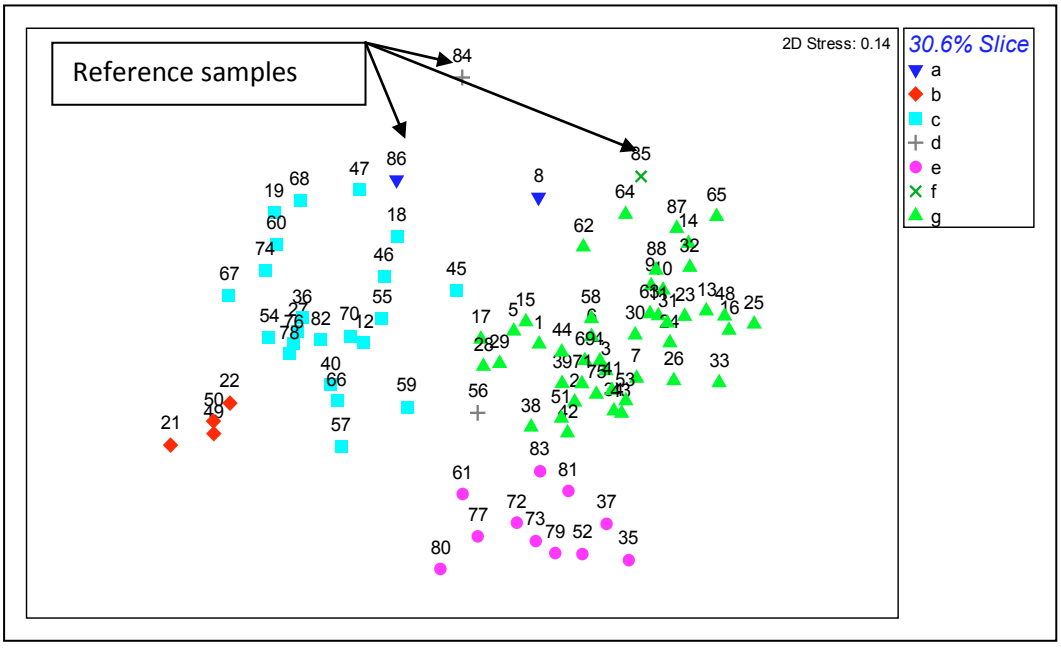

Figure 3.9: Grab sample array overlaid with classified groupings from multivariate analysis and illustrative seabed images.

3.4.3. Table 3.5 presents a summary of the biological and physical attributes of each of the faunal sample groupings. This includes allocation of a biotope code following matching of data with the Marine Habitat Classification System (Connor *et al*, 2004) and with the biotope allocation database tool (BioScribe) (Hooper *et al.*, 2011).

Table 3.5: Summary biological and physical attributes of sample groups derived from multivariate sample sorting of the faunal grab data.

Group (no. samples)	Characteristic species top 50% of internal similarity (SIMPER)	Mean no. species[1]	Mean no. individuals[2]	Av. depth (m)	Biotope Classification	Mean % sand, gravel & silt and sediment type(s).
a (2 samples) ▼	*Glycera lapidum* *Notomastus* *Crenella decussata* NEMERTEA *Syllis parapari* *Aricidea cerrutii*	57	170	49.0	SS.SMx.OMx.PoVen	%Gravel = 35.15 %Sand = 63.79 %Silt = 1.06
b (4 samples) ◆	*Pomatoceros triqueter* *Polydora caeca* *Serpulidae* *Pisidia longicornis* *Galathea intermedia* *Leptochiton asellus* *Hydroides norvegica* *Anomiidae (juv)* *Hinia incrassata* *Gibbula tumida* *Hiatella arctica*	94	483	41.7	SS.SCS.CCS	No psd data
C (22 samples) ■	Chone sp. Notomastus NEMERTEA Echinocyamus pusillus Glycera lapidum (agg) Nephasoma minutum Jasmineira caudata Polycirrus Lumbrineris gracilis Leptochiton asellus Hydroides norvegica Atylus vedlomensis A. paucibranchiata Pholoe baltica	86	367	47.2	SS.SCS.CCS. MedLumVen	%Gravel =18.22 %Sand = 79.33 %Silt = 2.45
d (2 samples) +	Glycera lapidum Pistella lornensis NEMERTEA Aglaophamus rubella Aponuphis bilineata	30	53	45.1	SS.SCS.ICS.Glap	%Gravel =22.58 %Sand = 75.09 %Silt = 2.32
e (11 samples) ●	Lumbrineris gracilis ENTEROPNEUSTA Peresiella clymenoides NEMERTEA Amphiuridae Phoronis Owenia fusiformis Echinocyamus pusillus Magelona alleni Diplocirrus glaucus	46	96	53.8	SS.SSa.OSa.OfusAfil or SS.SSa.IMuSa.Ffab Mag	%Gravel =2.58 %Sand = 93.97 %Silt = 3.45
f (1 sample) ×	Clymenura Moerella pygmaea Orbinia sertulata Pistella lornensis Thracia Phascolion strombus	26	30	45.5	SS.SCS.ICS.MoeVen	%Gravel =18.22 %Sand = 79.33 %Silt = 2.45

Group (no. samples)	Characteristic species top 50% of internal similarity (SIMPER)	Mean no. species[1]	Mean no. individuals[2]	Av. depth (m)	Biotope Classification	Mean % sand, gravel & silt and sediment type(s).
g (42 samples) ▲	Spiophanes bombyx C. praetenue Echinocyamus pusillus Ophelia borealis Poecilochaetus serpens Owenia fusiformis NEMERTEA Crenella decussata	43	106	47.9	SS.SSa.CFiSa.EpusOborApri	%Gravel =18.22 %Sand = 79.33 %Silt = 2.45

3.4.4. The largest grouping was Group g. This incorporated 42 of the faunal grab samples collected and was associated with predominately sand sediments with some gravel component in moderately deep water. Characteristic species included the polychaetes *Spiophanes bombyx, Ophelia borealis, Poecilochaetus serpens* and *Owenia fusiformis*, the molluscs *Cochlodesma praetenue* and *Crenella decussata* and the urchin *Echinocyamus pusillus*. These attributes matched with the **SS.SSa.CFiSa.EpusOborApri** biotope classification describing *Echinocyamus pusillus, Ophelia borealis* and *Abra prismatica* in circalittoral fine sand.

3.4.5. The next largest group was Group c (22 samples). This group comprised similar sand sediments as Group g but was characterised by a comparatively richer and more diverse fauna typified by the polychaetes *Chone* sp., *Notomastus* sp., *Lumbrineris gracilis, Aonides paucibranchiata* and *Glycera lapidum*, the pea urchin *E. pusillus*, the amphipod *Atylus vedlomensis* and ribbon worms Nemertea. These characteristics corresponded with the **SS.SCS.CCS.MedLumVen** biotope classification describing *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel. This biotope is similar to the **EpusOborApri** classification described above but occurs in slightly coarser sediments.

3.4.6. Group e comprised 11 predominantly sand sediments collected from relatively deep water locations. Levels of fine (silt/clay) sediments were generally higher compared to other samples. Typical species included *L. gracilis*, acorn worms Enteropneustra, ribbon worms, infaunal brittlestars Amphiuridae and the polychaetes *O. fusiformis* and *Magelona alleni*. Matching physical and biological group attributes with Bioscribe showed that the suite of species present corresponded with two biotope alternatives including **SS.SSa. OSa.OfusAfil,** describing *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy, and **SS.SSa.IMuSa.FabMag,** describing *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand. Both biotope types describe stable sandy and muddy sand seabed conditions. Given the depth range over which this biotope(s) occurred it is likely that the **OfusAfil** classification would be the most appropriate, the **FabMag** biotope being typically restricted to comparatively shallower water areas.

3.4.7. Coarse gravel sediments (Group b) were classified to biotope complex level only and did not readily match any higher resolution classifications. The **SS.SCS.CCS** code used to classify this group describes circalittoral coarse sediments however the presence of *Pomatoceros* sp. as a characterising species and the high mean numbers of species and numbers of individuals associated with this group suggested that these samples could represent a diverse variant of the **SS.SCS.CCS.PomB** classification.

3.4.8. The remaining coarser sediments (>20% gravel) were grouped into two smaller groupings (Groups a and d). These samples were characterised by a typical suite of coarse sand and gravelly sand fauna such as the polychaete *Glycera lapidum*, and the bivalve *Crenella decussata*. Accordingly, these sample groups matched the **SS.SMx.OMx.PoVen** classification, describing a polychaete-rich deep *Venus* community in offshore mixed sediments, and **SS.SCS.ICS.Glap** which may occur in relatively shallow water areas and describing *Glycera lapidum* in impoverished infralittoral mobile gravel and sand. One additional sample remained unclassified following the Bray-Curtis sample sorting and was matched with a **SS.SCS.ICS.MoeVen** (*Moerella* spp. with venerid bivalves in infralittoral gravelly sand) classification. This sample was found at the reference area located to the north east.

3.5. Biotope Mapping

3.5.1. Figure 3.10 presents the distribution of the classified biotopes overlaid onto the acoustic sediment interpretation in an attempt to show relationships between biotope classification and principal habitat types. Figure 3.11 shows similar data overlaid onto acquired bathymetry to assist assessment of relationships between biotopes and depth.

3.5.2. This process identified apparent close associations between sublittoral sand (**SS.SSa**) biotopes and interpreted sand sediments. Furthermore, relationship between sublittoral coarse sediment (**SS.SCS**) biotopes and sand and gravel were noted. Likewise, some biotopes appeared to be associated with certain bathymetry, for example **SS.SSa.Osa.OfusAfil** occurred in deeper waters whilst **SS.SCS.CCS** appeared to be restricted to comparatively shallower water areas. Having established these relationships, it was then possible to use sediment and bathymetric boundaries to interpolate and map the biotopes as presented in Figure 3.12.

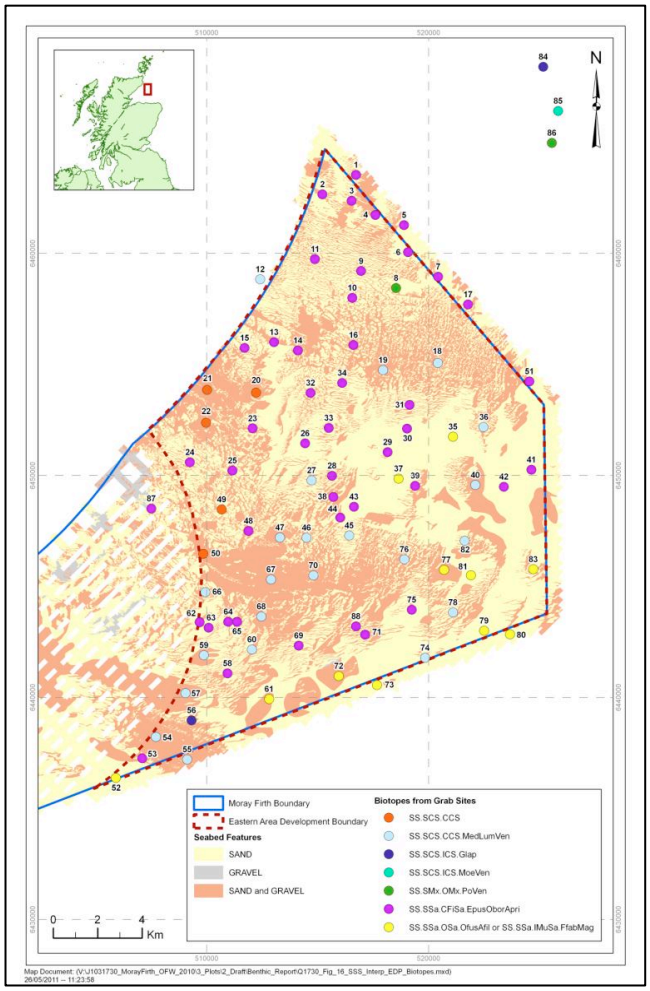

Figure 3.10. Biotope classifications overlaid onto the acoustic sediment interpretation

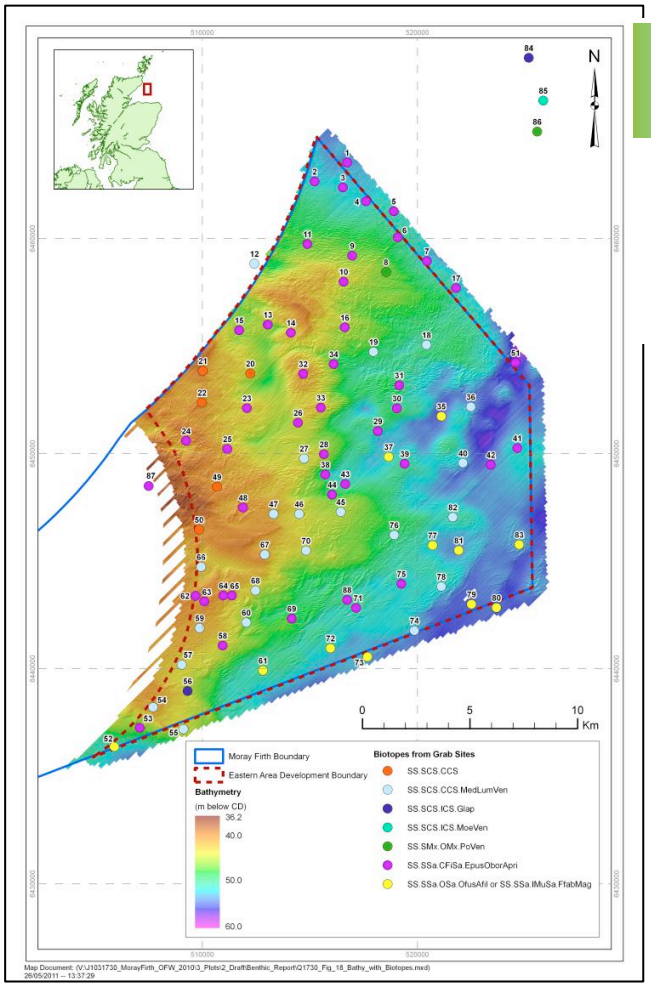

Figure 3.11. Biotope classifications overlaid onto bathymetry.

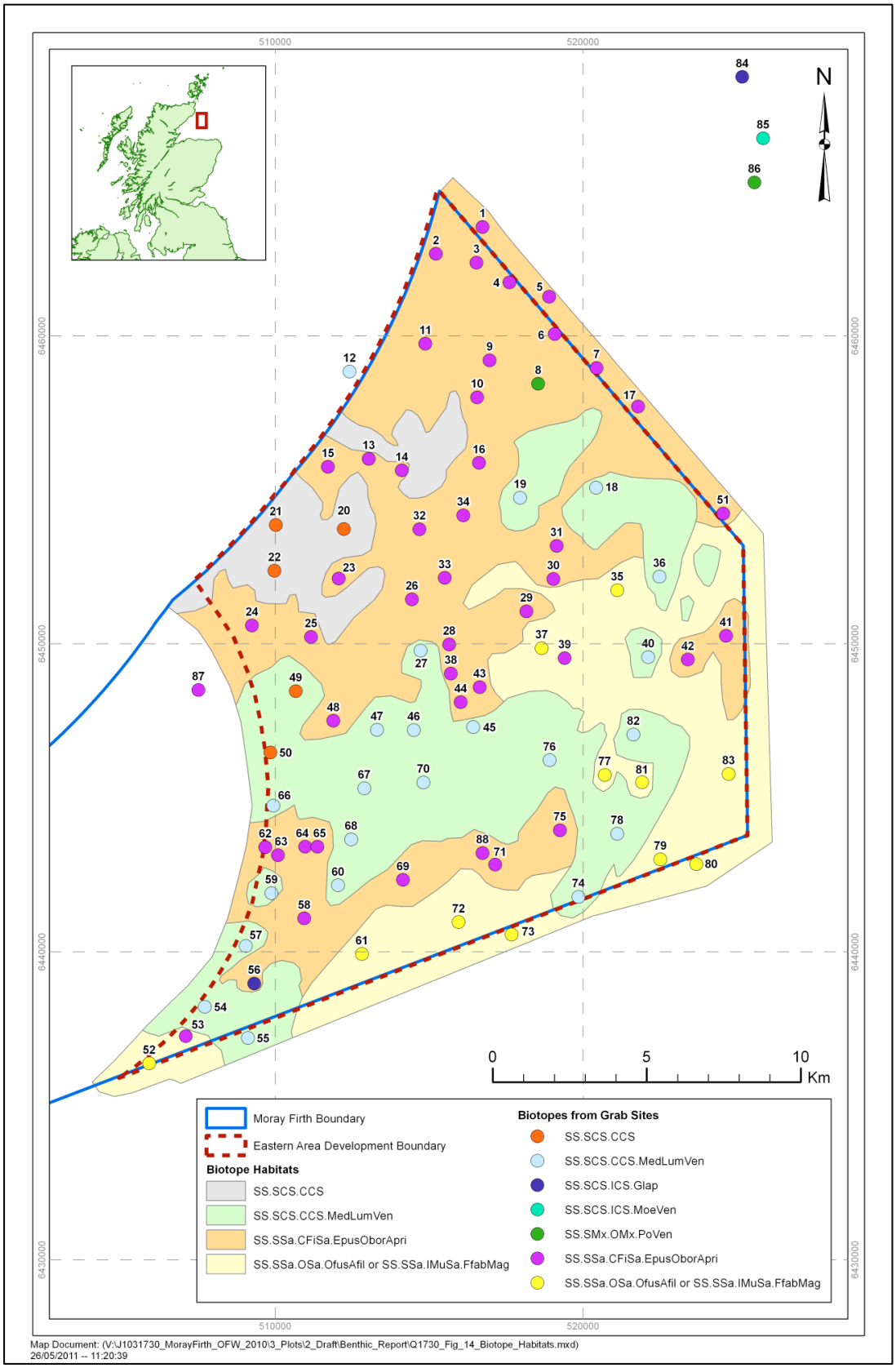

Figure 3.12. Biotope map for the eastern phase of the Moray Firth R3 offshore wind farm zone (Station 20 which was not sampled for macrofauna was allocated a SS.SCS.CCS classification based on the image data).

3.5.3. Comparison of the biotope map with MESH data (Figure 1.2) showed a degree of agreement in terms of the distributions of seabed habitats. In particular the presence of coarse gravel substrates to the north and east within the Stevenson site are consistent with MESH predicted habitats whilst the distribution of circalittoral fine sand and coarse sand are in broad agreement. The general accord between datasets suggests that MESH data could be used to establish the wider context and to indicate the potential extent of similar habitats across the wider Moray Firth region and beyond the boundaries of the development, recognising its broad-scale and predictive nature. The ability to relate and match seabed habitat conditions with those that occur across the wider region provides a regional context within which the potential effects of the wind farm development can be placed.

3.5.4. Reference samples (samples 84, 85 & 86) were noted to be peripheral to the MDS ordination (Figure 3.9) and were classified as minority biotopes. This suggested that the reference samples may not be representative of the principal biotopes present across the current study area. The suitability of reference stations will need to be a key consideration during baseline and monitoring surveys should consent for development be granted and may need to be re-positioned to reflect conditions that are more representative of those within the three wind farm sites.

3.5.5. BIOENV analysis was used to assess the abiotic variables that best matched the observed distribution of macrofauna from the multivariate sample sorting, the results of which are presented in Table 3.6. Input variables were normalised prior to the analysis and included the sediment fractions, sorting, mean particle diameter and depth. The results showed that depth was the single abiotic variable that best matched the observed macrofaunal distribution. The correlation was slightly improved with the addition of % sand, gravel and silt variables.

Table 3.6: Summary results of the BIOENV analysis

Abiotic Factor(s)	Correlation Coefficient (r)
Best single abiotic factor Depth	0.561
Best combination of factors %sand, %gravel, %silt/clay %sand, %gravel, %silt/clay, mean diameter %sand, %gravel, %silt/clay, mean diameter, median diameter	 0.566 0.564 0.563

3.6. 2m Beam Trawl Data

3.6.1. Information regarding assemblages of larger, more mobile epibenthos together with communities of colonial sessile fauna was collected using a series of twenty one 2 m beam trawls. Appendix XI presents a species list for the trawl samples.

3.6.2. These trawls identified a total of 203 taxa including 42 species of Cnidaria (anemones and hydroids), 9 species of tunicates (sea squirts) and 33 species of bryozoan (sea mats) attached to stones and shell material, together with free living taxa including 6 species of polychaetes, 39 species of crustacean, 18 species of molluscs, 21 species of echinoderms and 33 species of fish.

3.6.3. Table 3.7 presents the most abundant and frequently occurring free living and sessile species found within the 2 m beam trawl samples.

Table 3.7: Frequent and abundant species recorded from the 2 m beam trawl samples

Enumerated (free living) species			Non enumerated (colonial sessile) species	
Species	**No. trawls found (n=21)**	**Total abundance**	**Species**	**No. trawls found (n=21)**
Aequipecten opercularis	21	385	*Flustra foliacea*	21
Asterias rubens	20	977	*Hydrallmania falcata*	21
Macropodia tenuirostris	20	120	*Abietinaria abietina*	19
Agonus cataphractus	19	101	*Alcyonidium parasiticum*	16
Liocarcinus depurator	19	555	*Nemertesia sp.*	15
Pagurus bernhardus	19	72	*Alcyonium dipitatum*	13
Callionymus lyra	18	83	*Eucratea loricata*	13
Macropodia parva/rostrata	18	81	*Nemertesia ramosa*	13
Microchirus variegatus	18	82	*Halecium sp.*	12
Limanda limanda	17	336	*Sertularella polyzonias*	12
*Adamsia carciniopados**	15	169	*Chartella barleei*	11
Hyas coarctatus	15	32	*Sertularia sp.*	11
Pagarus prideaux	15	182	*Suberites (=ficus spp.)*	11
Buccinum undatum	14	17	*Halecium muricatum*	8
Pleuronectes platessa	14	74	*Alcyonidium diaphanum*	7
Echinus esculentus	13	157	*Kirchenpaueria pinnata*	7
Microstomus kitt	13	29	*Obelia spp.*	7
Psammechinus miliaris	13	37	*Nemertesia antennina*	6
Liocarcinus holsatus	12	37	*Rhizocaulus verticillatus*	6
Ophiura ophiura	12	29	*Sertularella tenella*	6

*Anemone which attaches to the shell of the hermit crab *Pagurus prideaux*

3.6.4. Queen scallops (*Aequipecten opercularis)* were recorded ubiquitously across the area. A total of 385 individuals were collected. Greatest numbers (+50 individuals) were found at trawl stations 10, 13 and 17 (slightly gravelly sand and gravelly sand

sediments) although confident assessment on distributions is not possible given that the beam trawl is not specifically designed to collect these species. Nonetheless a sufficient number of queen scallops were collected to attempt an initial assessment of population structure. Figure 3.13 shows the length frequency distribution for the queen scallops collected across the study area and suggests the presence of 2 or 3 different cohorts. Queen scallops grow up to about 9 cm in length (Carter, 2009) and so clearly, a number of the Moray Firth population are surviving to achieve this size.

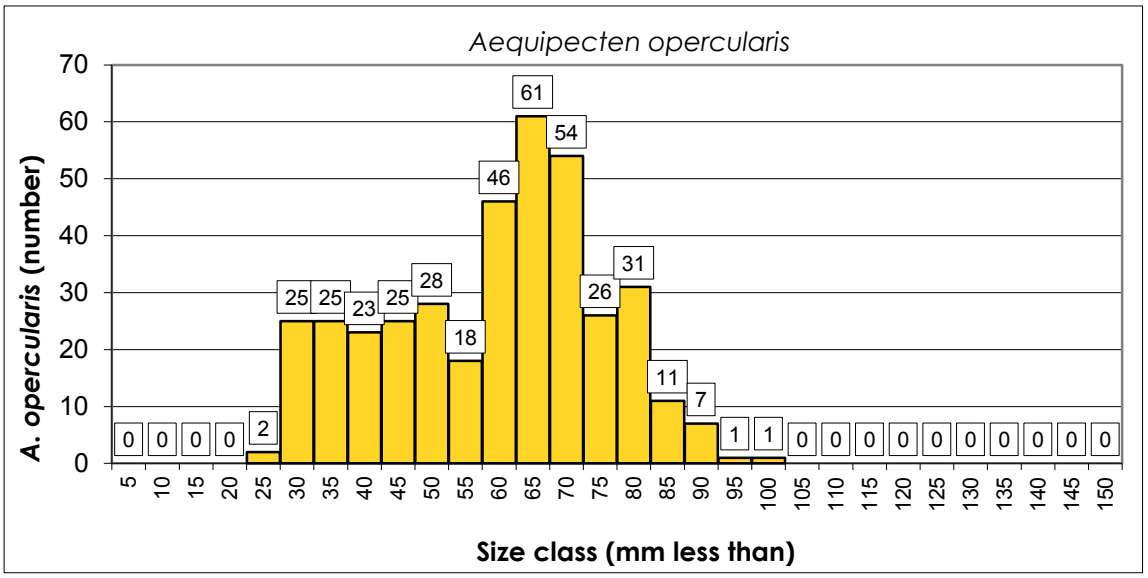

Figure 3.13. Length frequency distribution of queen scallop *Aequipecten operc ularis*.

3.6.5. Common starfish, *Asterias rubens*, spider crabs *Macropodia* spp., pogge *Agonus cataphractus*, harbour crab *Liocarcinus depurator*, hermit crabs *Pagurus* spp. dragonet *Callionymus lyra* and dab *Limanda limanda* also occurred commonly within the beam trawl samples highlighting their broad distribution across the study area. Other frequently occurring species included plaice *Pleuronectes platessa, thick back sole Microchirus variegatus* and lemon sole *Microstomus kitt,* urchins *Psammechinus miliaris* and *Echinus esculentus* and common whelk *Buccinum undatum*.

3.6.6. As well as occurring frequently within the trawls, dab, plaice and thick back sole were also present in relatively large numbers (336, 74 and 82 individuals respectively). Length frequency assessment of dab and plaice (Figure 3.14) suggested one size class present within the current study area at the time of survey (October).

3.6.7. The most numerous species found in the trawls however, was the prawn *Pandalina brevirostris* (not represented in Table 3.8*)*. A total of 528 individuals of this species were found at the trawl station T13 corresponding to station 56 towards the south and west of the survey array. This species was generally not recorded elsewhere within the study area (6 specimens were recorded in Trawl T15 and single specimens were found in four disparate grab samples). A high number of pink shrimp *Pandalus montagui* (191 individuals) were also sampled at this location. (A further 80 individuals

were also sampled at T15). Additionally, the squat lobster *Munida rugosa* was also caught in relatively large numbers at T13 (108 individuals). The reason for the presence of particularly high abundances of these mobile crustacean species at this location is presently unclear. They may be exhibiting a particular habitat preference or responding opportunistically to a temporary increase in benthic feeding resource.

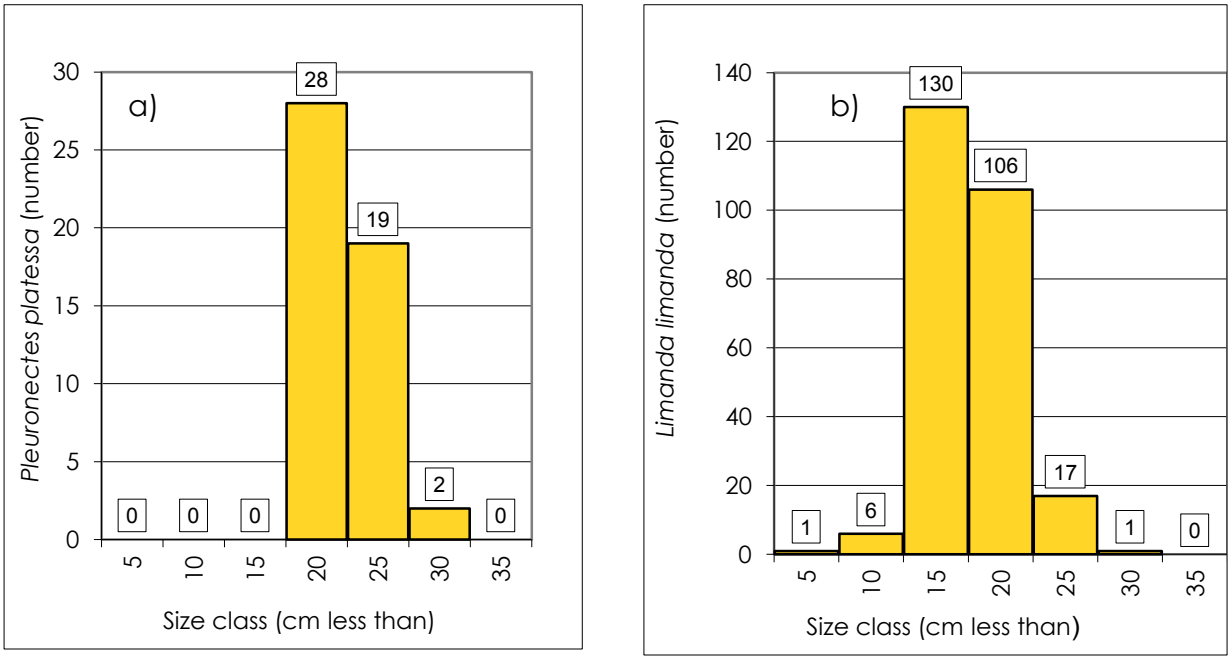

Figure 3.14. Length frequency distributions of a) plaice *Pleuronectes platessa* and b) dab *Limanda limanda* in 2 m beam trawls. (Note that fish were sub-sampled prior to length measures so not all individuals are represented).

3.6.8. Sandeels (predominantly *Ammodytes* sp.) were generally absent or present in low numbers within the trawl samples although some contained greater abundances as shown in Figure 3.15. Greatest numbers (45 total) were found in Trawl 14 which corresponded to the slightly gravelly sand sediments at grab station 65. Three species of sandeel were found here including *Hyperoplus lanceolatus* (14 individuals), *Ammodytes* sp. (28 individuals) and *Gymnammodytes semisquamatus* (3 individuals). Despite the grab data showing slightly gravelly sand, the video data (see Appendix II) suggested a patchy seabed comprising fine sand interspersed with areas of coarser shelly gravel substrate.

3.6.9. A further 39 individuals of *Ammodytes* sp. together with one specimen of *H. lanceolatus* were found within Trawl 19 corresponding to the coarser sand sediments at grab station 86 and located within the reference area to the north east. Elsewhere, sandeels were present in relatively low numbers ranging between 1 and 7 individuals per trawl.

3.6.10. The specimens found within the trawls were identified to *Ammodytes* in the field with further taxonomic discrimination in the laboratory to *A. tobianus* provided by the occasional specimen found in just 6 of the grab samples.

3.6.11. With regard to the trawl data, sandeels appeared to favour coarser sand to the south of the study area (i.e they were not found within the fine sand biotope **SS.SSa.CFiSa**) although the non specific nature of the beam trawl caveats firm conclusions in this regard. Grab data were, however, non conclusive as only single specimens were generally found in a few locations (see Figure 3.15).

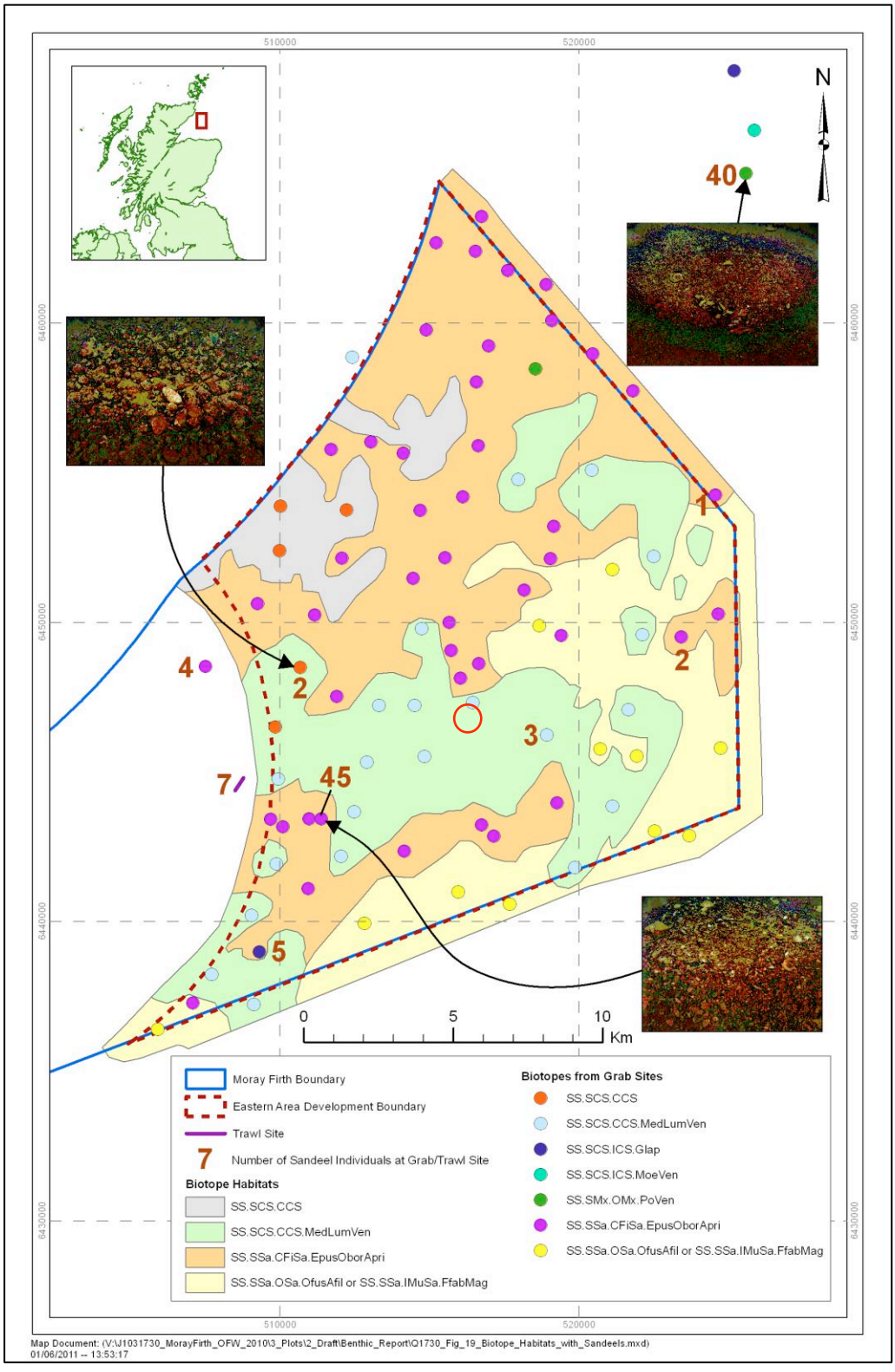

Figure 3.15. Distribution of the numbers of sandeels found in 2 m beam trawl samples.

3.6.12. As well as the free living species discussed above, the trawl samples also contained incidental shell material, stones and cobbles upon which various sessile encrusting species were found. Among these the most commonly occurring was the foliose

bryozoan *F. foliacea* and the hydroid *H. falcata*. Other frequently occurring sessile species in the trawls included the hydroids *Abietinaria abietina* and *Nemertesia* spp., the encrusting bryozoan *Eucratea loricata,* the erect *bryozoan Alcyonidium parasiticum* and the soft coral *Alcyonium digitatum*.

3.6.13. Multivariate sample sorting and MDS of the enumerated trawl sample data (Figures 3.16 and 3.17 respectively) identified four groupings. A subsequent SIMPER analysis identified species characteristic of each group as summarised in Table 3.8.

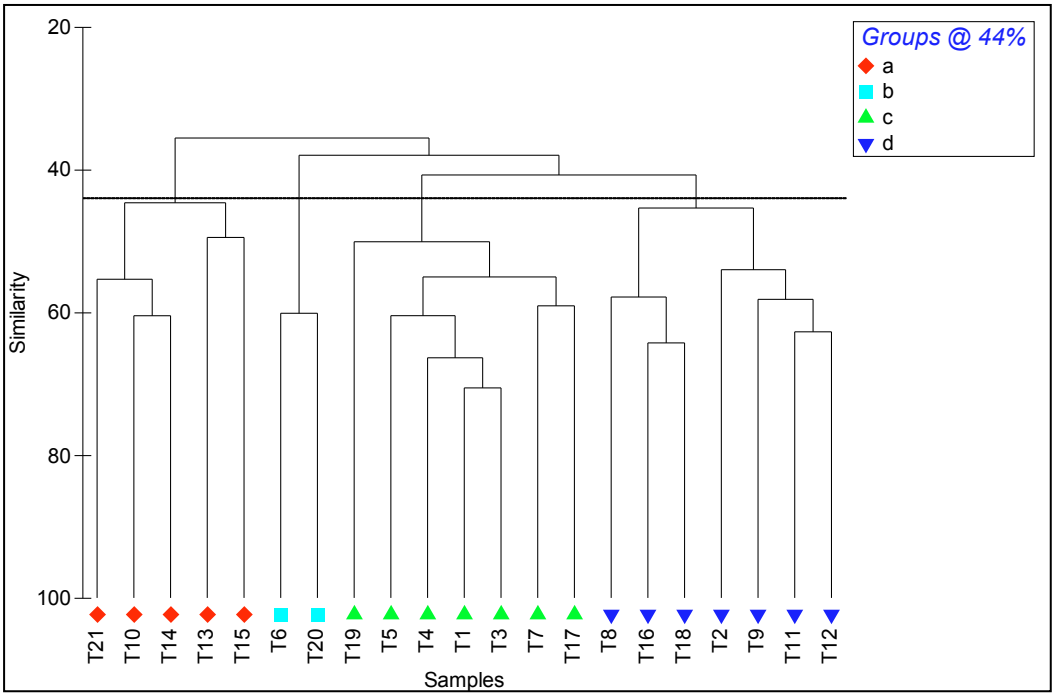

Figure 3.16. Group average similarity dendrogram (Bray – Curtis) of 2 m beam trawl data (sq rt transformed)

Figure 3.17. MDS ordination of 2 m beam trawl data (sq rt transformed)

Table 3.8: Summary of SIMPER analysis of the 2 m beam trawl samples.

Group a◆ (5 samples)	Group b■ (2 samples)	Group c▲ (7 samples)	Group d▼ (7 samples)
Average similarity: 48.81	Average similarity: 60.08	Average similarity: 56.37	Average similarity: 50.70
Asterias rubens	*Asterias rubens*	*Asterias rubens*	*Liocarcinus depurator*
Liocarcinus depurator	*Limanda limanda*	*Pagarus prideaux*	*Aequipecten opercularis*
Aequipecten opercularis		*Adamsia carciniopados*	*Callionymus lyra*
Echinus esculentus		*Aequipecten opercularis*	*Macropodia tenuirostris*
Limanda limanda		*Macropodia parva/rostrata*	*Agonus cataphractus*
Pandalus montagui		*Limanda limanda*	
Munida rugosa			

3.6.14. Overlay of the multivariate sample groupings (Figure 3.17) onto the sample array suggested a degree of geographical distinction between epibenthic assemblages. South and west of the development area, for example, the epibenthos comprising Group a was characterised by common starfish, harbour crab, scallop, urchins *Echninus esculentus*, pink shrimp *Pandalus montagui* and squat lobster *Munida rugosa*. SIMPER analysis showed that this group was differentiated from the other groupings because of the greater abundance of common starfish, pink shrimp and urchin compared to other locations within the study area. Group c on the other hand encompassed an assemblage with a more northern distribution. This group was also characterised by common starfish, hermit crab, scallop, spider crab and dab but was differentiated from other groups in the study on the basis of the greater abundance of starfish and hermit crab but reduced numbers of dab and harbour crab. Group b incorporated samples containing more common starfish and dab but less hermit crab, harbour crab and urchins compared to those within other sample groupings.

3.6.15. Deeper water areas to the south (Group d) were characterised by harbour crab, scallop, dragonet *Callionymus lyra*, spider crab and pogge *Agonus cataphractus* together with plaice and thickback sole. As such, this assemblage appeared to be differentiated on the basis of a distinct community type rather than varying abundance of common taxa.

3.6.16. Other key observations form the trawl samples included cat shark egg cases within Trawls 13 and 14 and squid eggs at T5. Whelk egg masses were observed within Trawl samples T1 and T4.

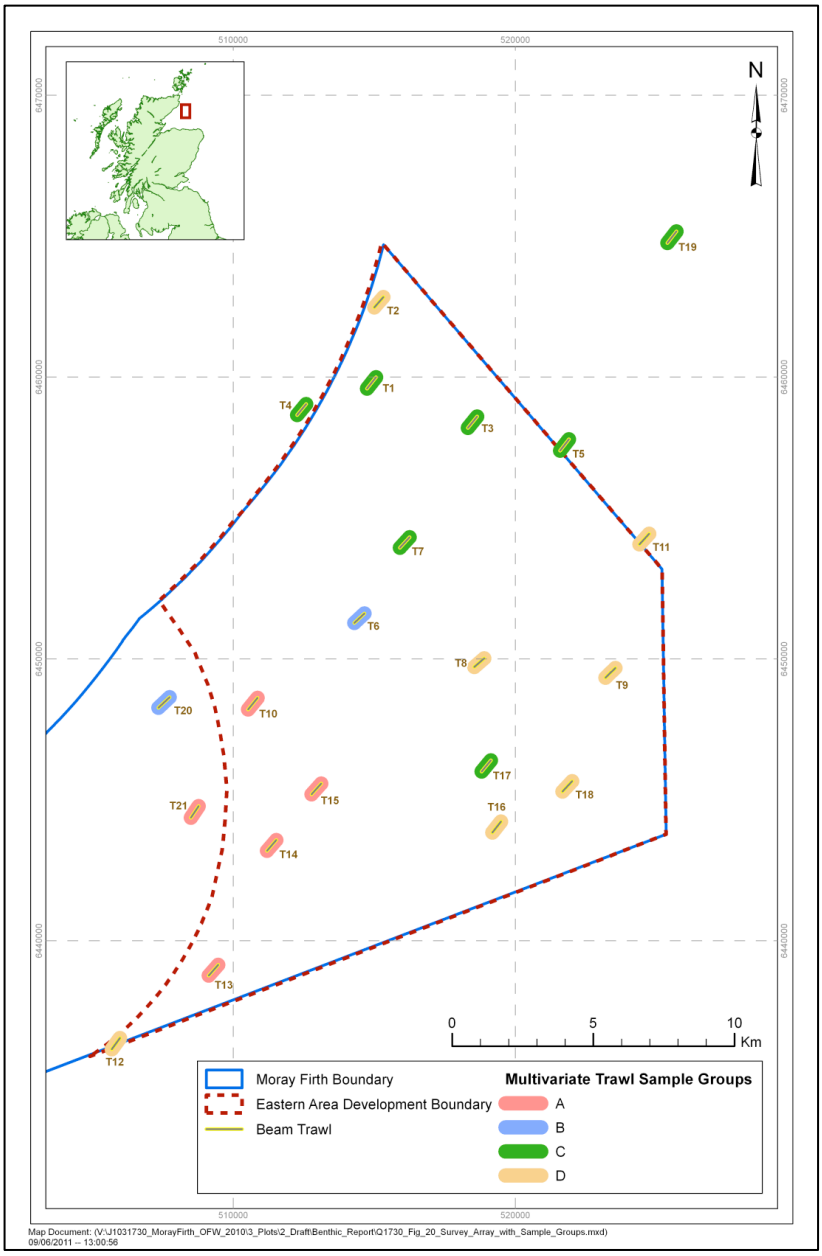

Figure 3.17. Multivariate groups of 2 m beam trawl samples overlaid on to the sample array

4. Discussion

4.1. Physical / biological relationships

4.1.1. Relationships between sediment macrobenthic communities and physical environmental factors in the North Sea have been well studied (i.e. Glémarec, 1973; Eleftheriou & Basford, 1989; Dyer *et al.*, 1983;, Kunitzer et al., 1992; Heip & Craeymeersch, 1995; Rees *et al.*, 1999 and Reiss et al., 2010) with depth and associated changes in sediment type and thermal stability at the seabed emerging as key factors influencing benthic faunal distributions.

4.1.2. Glémarec (1973) places the current study area within the "*étage cotier*" (coastal étage) which relates to a broad sea area lying between the northern boundary of the Dogger Bank and the deeper waters of the Fladen Grounds and including near shore waters of eastern Scotland and Shetland. It represents a set of distinct broad-scale North Sea communities and parallel sediment and temperature conditions encompassing deep water (+40 m) fine to coarse sand sediment habitats subject to varying temperatures. Areas corresponding to this étage are generally situated between coastal waters and the waters of the open sea and can be subject to constant mixing or may present a thermocline with both conditions subject to large annual temperature variations of up to 7 or 8^0C.

4.1.3. Within Glémerec's "coastal étage", both the ICES Benthic Working Group (Künitzer *et al*.,1992) and Reiss *et al*. (2010) identified discrete, predominately deep water coarse sediment infaunal groups. Conspicuous species of these groups included the polychaetes *Ophelia borealis*, *Exogone hebes, Spiophanes bombyx, Polycirrus* sp., *Minuspio* sp. *and Aricidea* sp as well as the bivalve *Thyasira* sp. and the brittlestar *Amphiura filiformis.* As well as encompassing the outer Moray Firth study area these infaunal groups also incorporated deep water sites across the northern North Sea; the Reiss *et al* groups also extending over areas within the central North Sea.

4.1.4. Overlaying these broad-scale sediment assemblages are distinct mobile epibenthic communities, as explained in Chapter 1. The current study area corresponds to a characteristic mobile deep water epibenthic North Sea community characterised by common starfish *Asterias rubens*, sea urchins *Echinus* spp., brown shrimp, *Crangon allmanni*, and hermit crab (Dyer *et al.*, 1983; Jennings *et al.*, 1999; Rees *et al.*, 1999 and Callaway *et al.*, 2002) and a typical assemblage of demersal fish species comprising whiting *Merlangius merlangus*, dab *Limanda limanda*, haddock *Melanogrammus aeglefinus*, lemon sole *Microstomus kitt*, plaice *Pleuronectes platessa*, grey gurnard *Eutrigla gurnardus*, herring *Clupea harengus* and American plaice or long rough dab *Hippoglossoides platessoides* (Callaway *et al.,* 2002; Reiss *et al*., 2010).

4.1.5. Together with the MESH data presented in Figure 1.2, these high level studies set the broad regional context within which the present site specific conditions may be set. Current data support the presence of stable, predominately sand habitats with varying proportions of gravel possibly relating to differing quantities of shell material between samples. A degree of sediment stability is inferred from the apparent lack of significant seabed bedforms, such as ripples, as evidenced by the image data, suggesting limited sediment mobility and little associated natural disturbance effects on benthos. Newell *et al*. (1998) discuss the idea of ecological succession in relation to seabed disturbances (in this instance due to marine aggregate extraction) and supports the presence of stable "equilibrium" communities at Smith Bank. Analysis of historic UKOOA data (Figure 1.5) also provides evidence of "equilibrium" communities which have varied little in terms of species composition over time. Additionally Hartley & Bishop (1986) remark that the generally rich and diverse nature of the sediment communities at Smith Bank suggest that frequent disturbance events are unlikely.

4.1.6. In general, the study area was characterised by a rich and diverse sediment fauna dominated by infaunal polychaetes such as *S. bombyx, Notomastus* spp. and *L. gracilis*, as well as the burrowing urchin *E. pusillus*, the sabellid worm Chone sp. and the bivalve, *C. praetenue*. Other abundant species included *Pomatoceros triqueter,* Serpulidae, *Polydora caeca,* and *Hydroides norvegicus* although occurrence was subject to the presence of larger gravel, stones or shell fragments onto which they may attach or burrow into. Similarly, colonial epifaunal species were generally confined to mixed sediment areas where suitable larger stones and larger shell particles were present for attachment.

4.1.7. Trawl and video data identified a number of characteristic epibenthic species including scallops *Aequipecten opercularis,* common starfish, *Asterias rubens*, pogge *Agonus cataphractus*, harbour crab *Liocarcinus depurator*, hermit crabs *Pagurus* spp. dragonet *Callionymus lyra, whiting Merlangius merlangus* and dab *Limanda limanda* as well as plaice *Pleuronectes platessa,* thick back sole *Microchirus variegatus* and lemon sole *Microstomus kitt*. There was generally little distinction between the mobile epibenthic assemblages identified by multivariate techniques, these being separated largely by differences in the relative abundances of the characterising species, including dab and common starfish. The exception to this was the more distinctive deeper water assemblage characterised by pogge, dragonet and harbour crab.

4.1.8. Dab were regarded as particularly numerous on this occasion. A total of 336 individuals were caught in the beam trawls. This was four times the number of other demersal fish species such as plaice and thick back sole. Length frequency assessment of dab and plaice suggested a single cohort of young fish (mature plaice are around 30 cm in length whilst most dab are around 25 – 30 cm) although whether this constitutes a nursery or intermediate nursery area is unknown. Whiting were also commonly observed from the seabed video footage but were rarely caught in the beam trawls.

4.1.9. The capture of very large numbers of the prawns *Pandalina brevirostris* and *Pandalus monatgui* and the squat lobster *Munida rugosa* in a single the beam trawl (T13) is presently difficult to explain in terms of habitat preference. Examination of physical and video data for this location has not highlighted any specific conditions that may be preferred over other locations visited during the current survey. Influx of mobile species to areas recently disturbed by marine dredging and demersal fishing is well documented (Kaiser & Spencer, 1994; Ramsay *et al*., 1998 and Smith *et al.*, 2006) and is typically associated with responses to scavenging opportunities presented by damaged benthos. Whether these species were responding to such an event is not confirmed here.

4.1.10. Overall however, no distribution pattern for species numbers, abundance and biomass was apparent apart from a general trend of increasing values towards the south and east, possibly relating to increased occurrences of patches of coarse sediment in this direction. In general, simpler, homogeneous sediments offer few micro-niches for colonisation of benthic species and consequently these substrates support fewer species compared to more mixed, complex sediments. Mixed sand and gravels, in contrast, provide burrowing habitat for infauna whilst the surfaces of

gravel, stones and shell fragments provide suitable attachment sites for a range of encrusting taxa. Cryptic fauna may reside and find refuge under stones and cobbles. These substrates are therefore generally considered to have a higher species carrying capacity supporting a comparatively greater diversity and abundance and benthic species. Consequently, coarse substrates within the study area would be expected to support higher numbers of species and abundance compared with simpler sand habitats.

4.1.11. Summarising current grab sample data, (Table 4.1) shows that within the study area more species and individuals and greater biomass were indeed found in coarser and more poorly sorted sandy gravel and gavel sediments compared to the better sorted slightly gravelly sands and gravelly sand substrates in agreement with the established view.

Table 4.1 Mean sorting, species numbers, numbers of individuals and biomass for each sediment category.

Folk Classification	Mean Sorting	Mean No. Species	Mean No. Individuals	Mean biomass (gAFDW)
(g)S	0.78	42	106	0.4379
gS	1.67	62	185	1.3043
sG	2.52	86	396	2.6265
G	no data	95	433	3.4325

4.1.12. Local sediment conditions and species attributes therefore appear to fit well within the broad regional context and general ecological concepts. Also, and in reflection of the wider scale physical influences, depth was found to be the principle factor influencing macrofaunal distribution within the current study area. This apparent relationship may also be due, in part, to the presence of natural sediment gradients in relation to changes in depth within the locale (Hartley & Bishop, 1986) and the result of specific species responses to the different substrate conditions available (Seiderer & Newell, 1999).

4.2. The communities present

4.2.1. It is these gradients in the physical attributes of the benthic environment and the parallel changes in species composition of the associated communities which have been the focus of attention within the current study. Here, we have attempted to identify discrete communities (through application of multivariate techniques) and relate these to the specific conditions within which they occur. The identified communities and associated physical conditions have then been compared with the Marine Habitat Classification System to define biotopes.

4.2.2. Biotopes represent discrete ecological units describing specific physical habitat conditions (i.e. substrate type, depth, stability etc) together with the community of benthic organisms that characterise those conditions. The mapping of the extents of biotopes (as per Figure 3.15) is therefore a convenient method for assessing the distribution of the benthic ecological resource within a given area. Furthermore, there are considerable quantities of data on the sensitivity of biotopes to a wide

range of effects including effects that are predicted to arise as a result of construction, operation and de-commissioning activities associated with the proposed wind farm. As such, the classification and mapping of biotopes is highly relevant to impact assessment processes and will be a principal tool for use in the Environmental Statement.

4.2.3. The study area was dominated by a number of closely related circalittoral (deep water) and offshore sand biotopes. None of the biotopes found are considered rare or of any particular conservation interest. The **MoeVen** biotope is listed on the current Scottish draft list of Priority Marine Features but was only found at one location in the reference area and outside of the boundaries of the proposed development. As such, the three wind farm sites within the Moray R3 wind farm (eastern phase) will not affect this biotope.

4.2.4. The principal biotope inside the development boundaries was found to be **SS.SSa.CFiSa.EpusOborApri.** This describes *Echinocyamus pusillus*, *Ophelia borealis* and *Abra prismatica* in circalittoral fine sand. Connor *et al*. (2004) suggest that this biotope occurs from 40 – 140 m depths and has been previously recorded in the central and northern North Sea. It is similar to the other common biotope found within the current study area, **SS.SCS.CCS.MedLumVen,** but occurs in comparatively finer sediment conditions and contains fewer venerid bivalves (Connor *et al*., 2004). Species numbers and numbers of individuals were relatively low in comparison with the other principal biotopes. This may be a natural consequence of the homogenous fine sand habitat present as explained above.

4.2.5. **SS.SCS.CCS.MedLumVen** describes *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral gravels, coarse to medium sands, and shell gravels, and generally at depths of greater than 15-20m (Connor *et al*., 2004). Conspicuous taxa include those which are also common to the **EpusOborApri** biotope above with the addition of conspicuous venerid bivalves. The presence of epifauna such as *Hydroides norvegicus* and *Pomatoceros lamarcki* in the current study accords with the established description of this biotope. Glémarec (1973) places **MedLumVen** within the generally shallower water "infralittoral étage" and so the biotope represented here may be a deep water variant. Indeed, Connor *et al*. (2004) discuss the temporal variability of the **MedLumVen** biotope and suggest that it may actually be closer to a biotope complex in which a number of biotopes or sub-biotopes may yet be defined. It is generally regarded as a common and widespread biotope, making up a significant proportion of the offshore Irish Sea benthos, and has been previously recorded within the outer Moray Firth. Species numbers and abundance values were higher than for the fine sand habitat above reflecting the greater complexity of the sediment habitat available.

4.2.6. Coarse gravel areas were generally not amenable to grab sampling, even with the 165 kg 0.1m^2 mini-Hamon grab, but the samples returned revealed a comparatively rich and diverse habitat of infauna and epifauna nonetheless. These areas were classified to the habitat complex level of **SS.SCS.CCS** describing circalittoral coarse sediments although video and trawl data showing the presence of abundant calcareous tube worms, *Pomatoceros* spp. barnacles *Verruca stroemia* supported tentative refinement to the classification to **SS.SCS.CCS.PomB.**

4.2.7. Deeper water areas within the study area were difficult to match to any existing biotope within the current classification system. For this reason, two biotopes possessing elements that broadly corresponded were ascribed. These included **SS.SSa.OSa.OfusAfil** describing areas of slightly muddy sand (generally <20% mud) in offshore waters characterised by high numbers of the tube building polychaete *Owenia fusiformis* often with the brittlestar *Amphiura filiformis*. The other biotope considered was **SS.SSa.IMuSa.FfabMag** describing *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand. Neither classification was entirely appropriate in this instance suggesting the presence of deep water variant.

4.2.8. The other biotopes found were only represented by one or two samples only. Whilst closely resembling the four principal biotopes described above, they reflect the presence of coarser sand substrates and are generally more characteristic of shallower water areas.

4.3. Important features

4.3.1. None of the biotopes recorded are regarded as rare or scarce and none have any significant conservation status. The exception to this was the biotope **MoeVen** which is listed on the draft Scottish list of Priority Marine Features (PMF). However, this biotope was only found at one location within the reference area and outside of the boundaries of the current development area. Consequently, no adverse effects on this biotope are forecast as a result of the construction and operation of the wind farm.

4.3.2. Nine juveniles of the bivalve *Arctica islandica* were found. This is unlikely to constitute an important population and no significant adverse effects on this PMF list species are anticipated.

4.3.3. Sandeels (as sandeel complex *Ammodytes marinus, A. tobianus*) are also included within the Scottish draft PMF list. These species have an important functional role supporting many types of larger fish, seabirds and marine mammals as a food source. Data collected here suggested that in general, the study area is not important for sandeels although the sampling collection methods used are not regarded as particularly suitable in this regard. Nevertheless, the data tended to support a general sandeel preference for coarser sediments in accordance with current understanding (Holland *et al*, 2005; Greenstreet *et al*., 2010).

4.4. Assessment of potential effects

4.4.1. A full assessment of the likely effects of the construction of the wind farm on benthic ecology will be provided within the Environmental Statement. The following provides an initial appraisal of the consequences of construction based upon the findings of the current site specific study.

4.4.2. Cefas (2004) identifies a number of potential effects of wind farm construction on benthic ecology. These include permanent loss of seabed habitat as a result of the placement of turbine foundations and scour protection material as well as temporary seabed disturbance effects from cable laying activities. Sediment plumes arising from construction may be transported away from the construction site via tidal current

movements resulting in potential indirect effects of sediment scour smothering beyond the boundaries of the wind farm.

4.4.3. Possible benthic ecological consequences of raised sediment plumes include adverse scouring effects on filter feeding species as a result of damage to sensitive feeding and respiratory apparatus and smothering of encrusting communities. Errant sediment burrowing animals are likely to be tolerant to sediment scouring and smothering effects and will be able to re-position to preferred feeding depths following burial. Effects will be temporary, lasting for the duration of the construction activity only after which recovery of communities will occur.

4.4.4. Research evidence from the marine aggregates industry suggests that disturbed {dredged} sands and gravels typically re-settle within a zone of a few hundred metres of the original disturbance (Hitchcock & Drucker, 1996; Newell *et al*., 1998; Hitchcock and Bell, 2004) although numerical modelling will refine site specific footprints within the ES. Newell *et al*. (2004) found no suppression of macrobenthos beyond 100m of seabed [dredging] disturbance. The **SS.SCS.CCS.PomB** biotope is not sensitive to increased suspended sediments, has low sensitivity to sediment smothering and will recover from associated effects within a few weeks to months (Tyler-Watts, 2008. Other biotopes identified here are sedimentary and so are unlikely to be significantly impacted by temporary raised sediment plumes.

4.4.5. With regard to habitat loss, there are no rare or protected habitats within the boundaries of the wind farm and none are of restricted distribution. As discussed above, all habitats present within the site are likely to be well represented throughout the wider region so wind farm construction is not expected to lead to a permanent reduction in habitat diversity within the region. Whilst the placement of turbine foundations onto the seabed will reduce the overall area of habitat, this is likely to be of minor or negligible significance within the context of the wider availability of representative habitats throughout the wider Moray Firth region.

4.4.6. The installation of inter-turbine cables will disturb sediment habitats and associated communities but any related ecological effects will be temporary, lasting for the duration of the cable activity only. Following abatement of the disturbance, habitats and communities are expected to recover. Restitution of the habitat will be facilitated by back-filling of trenches into which the cables have been laid, where this occurs. Re-colonisation of disturbed sediment habitats will occur as a result of passive import and settlement of larvae from surrounding adult populations outside of the effected areas and through active migration of adults.

4.4.7. There is a considerable amount of research material concerning the impacts of seabed disturbances on benthic habitats within the marine aggregates industry and a good understanding of the recovery characteristics of sediment communities has now been reached (Hill *et al*., 2011). In addition, MarLIN provides detailed peer reviewed information on the sensitivity and recovery characteristics of biotopes.

4.4.8. The established view of benthic responses to impacts involves the concept of ecological succession as eluded to above. This describes a predictable procession of species influx and settlement from initial colonisation by opportunists (termed r-strategists) to the eventual establishment of a stable or equilibrium community (Newell

et al., 1998). Following cessation of the benthic impact there is an initial recovery stage characterised by the rapid import of opportunistic species. These are typically small bodied, short lived but highly fecund species capable of quickly populating disturbed conditions. As habitat conditions continue to recover and seabed stability increases, other less disturbance tolerant species can become established. These may include larger, slower growing and less fecund species (K-strategists) which invest energy in competitive superiority rather than high turnover of populations. There is thus a period of transition characterised by mixed r and K strategists until an equilibrium state is reached. Typically, this equilibrium community resembles that which occurred prior to the impact occurring or which reflects the new habitat conditions. The period of time between initial impact and full recovery of the benthos depends upon a number of factors including nature of the original habitat, frequency and duration of the impact, hydrodynamic conditions and availability of comparable populations in adjacent non impacts areas (Boyd *et al*., 2003; 2004; Cooper *et al*., 2005).

4.4.9. Based on the biotopes identified during the current study, recovery of the sediment communities is likely to occur within 5 years. Rapid import of larvae and migration of adults is expected from adjacent non-affected sediments allowing initial colonisation to commence immediately after cessation of construction related disturbances. Recovery of the infaunal biomass relates to the growth of larger mollusc, principally bivalve species but is forecast to be substantially complete within 5 years.

4.4.10. The foundations of the wind turbines and any associated scour protection material will introduce new hard substrate into an otherwise sedimentary environment. This will represent new habitat for colonisation by encrusting and attaching species including algae, barnacles, encrusting worms and bivalves. Picken (1986) has conducted detailed studies on the fouling communities of the Beatrice infrastructure (see Chapter 1). It was found that hard structures introduced at the Smith Bank were colonised by a succession of fouling organisms. Structures were initially colonised by barnacles and tubeworms within the first year of placement followed by an over-growth of blue mussels *Mytilus edulis* and seaweeds in the uppermost 5 m of water. Hydroids, soft corals and ascidians dominated surfaces below the seaweeds. As noted above, these species can be seen as migrants into the area that were not typical of the benthic assemblages recorded pre-development.

4.5. Sediment contaminants

4.5.1. Levels of sediment contaminants were below Cefas action levels and Canadian Interim Sediment Quality Guidelines. No significant adverse environmental effects of the raised contaminants are therefore expected as a result of construction of the wind farm. Levels of total organic carbon were <0.4% over the study area and within the range historically found at Smith Bank. No evidence of any organic enrichment was detected.

4.5.2. Benthic studies in the North Sea, English Channel and Celtic seas (Rees *et al*., 1999) found relatively low levels of contaminants in marine sediment samples. No evidence of any adverse effects on benthic fauna was recorded. The authors suggested that any contamination effects were subsidiary to the effects of natural processes with respect to macrofaunal distribution at the stations sampled.

5. Conclusions

5.1.1. This study has used grab and trawl sampling and seabed surveillance techniques to characterise the seabed habitats and biological communities within the vicinity of the Moray Firth offshore wind farm proposals. The data will inform the environmental impact assessment and ES in support of the application for wind farm development consent.

5.1.2. The habitats and communities present were found to be consistent with those of the wider region. Macrofaunal distribution was based on depth although other associated influences such as sediment gradients and bottom temperatures may be important in this respect.

*5.1.*3. The study area was dominated by stable, circalittoral clean, fine and medium sands with varying proportions of shell gravel providing additional structural complexity to sediment habitats. Associated sediment communities were regarded as rich and diverse and were characterised by sand fauna considered to be typical of the wider region. Patches of coarser sediments supported typical communities of encrusting and cryptic taxa. Deeper water areas to the south of the study area exhibited slightly elevated levels of fine sediments (up to around 5%) and supported sparse seapens *Pennatula phosphorea*.

5.1.4. A synthesis of sediment and biological data with subsequent matching with the Marine Habitat Classification System revealed four principal sediment biotopes considered to be typical of the wider region. Three further closely related biotopes were also identified at a few sample stations but representing shallower water, coarser sediment conditions.

5.1.5. No features of significant nature conservation importance were identified during the current study. The exceptions to this were the presence of 9 juveniles of the bivalve *Arctica islandica*, sandeels and the biotope **MoeVen**. However, current data suggest that the study area does not constitute an important location for these features and so no significant effects on nature conservation features are forecast as a result of the construction and operation of the proposed wind farm. The **MoeVen** biotope was only found at the reference sites and outside of the predicted influences of the three wind farms.

5.1.6. Sediment contaminants were below guideline values so that no deleterious effects on marine life are expected as a result of the proposed scheme. In addition, the dominant sediment biotopes present are considered to be tolerant to the predicted effects of the construction and operation of the wind farm and are widely represented throughout the wider region. Consequently, no significant adverse effects on benthic ecology are expected.

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Appendix I Grab and video sampling locations and field observations

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Appendix I
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Seabed video sample locations and field observations

		Start		End		Field observations of substrate	Notes on observed fauna
Station ID	Date	Easting	Northing	Easting	Northing		
1	16/10/2010	516774,37	6463595,14	516734,31	6463480,09	Sand ripples with burrows.	Pagurid crabs and flatfish.
2	16/10/2010	515247,38	6462719,27	515210,66	6462598,9	Rippled sand.	Flatfish, gurnards and Pagurid crabs.
3	16/10/2010	516536,37	6462412,55	516515,09	6462277,17	Shelly sand.	Pagurid crabs. Echinus sp., hydroid tufts. Haddock.
4	17/10/2010	517613,8	6461761,85	517694,14	6461699,78	Rippled shelly sand.	Flatfish.
5	17/10/2010	518923,66	6461306,82	518809,08	6461226,33	Coarse looking shelly sand.	Hydroid tufts, Lanice conchilega, haddock.
6	17/10/2010	519117,56	6460083,38	518972	6460024,3	Coarse shelly sand. Some cobbles. Large cobbles/or small boulders very occasional. Burrows present.	Thick backed sole, hydroid tufts, Echinus sp.
7	17/10/2010	520490,11	6458967,99	520354,17	6458906,78	Compacted and coarse shelly sand with occasional cobble.	Hydroid tufts.
8	17/10/2010	518555,88	6458452,91	518580,27	6458297,49	Rippled shelly sand.	Hydroid tufts. Pagurid crabs. Astropecten irregularis, Chaetopterus tubes very notable. Lanice conchilega.
9	17/10/2010	517002,11	6459232,66	516766,89	6459238,55	Shelly gravelly sand waves.	None noted.
10	17/10/2010	516611,05	6458052,86	516525,43	6457965,9	Varying along the transect between rippled sand and sand waves, becoming coarser at the end.	
11	17/10/2010	514926,52	6459800,67	514818,63	6459665,81	Rippled sand, becoming waves in places.	Worm tubes.
12	17/10/2010	512446,61	6458880,22	512360,87	6458777,79	Rippled sand with a central area of shelly gravel.	Echinus sp., Asterias rubens, Pagurid crabs.
13	15/10/2010	513047,91	6455961,7	513018,57	6456137,78	Rippled compacted sand. Towards the end becoming gravelly shell.	Pagurid crabs, Aequipecten opercularis, and Luidia ciliaris.
14	15/10/2010	514133,66	6455563,73	514072,44	6455688,32	Rippled sand with sand waves, ridges and burrows.	Pagurid crabs.
15	17/10/2010	511779,27	6455754,35	511647,53	6455793,92	Rippled sand becoming gradually coarser shelly gravel, increasing in coarseness until the end of the transect.	None noted.
16	15/10/2010	516678,54	6455831,62	516629,78	6455941,67	Compacted sediment. Forms ridges and lines running SW to NE. Dense aggregations of cobbles, pebbles, and shells between the ridges. Along the transect becomes rippled shelly sand. Burrows present.	Flatfish, gurnards, dense Lanice conchilega in places, hydro/bryo tufts.
17	17/10/2010	521819,94	6457736,4	521695,16	6457665,48	Compacted shelly sand with areas of coarser compaction with gravel and pebbles visible in places. Occasional large cobble.	Hydroid tufts. Pagurid crabs.
18	15/10/2010	520453,98	6455033,96	520488,2	6455216,19	Rippled shelly sand with patches of hard consolidated ground with cobbles, pebbles and small boulders. Very coarse substrate interwoven with patches of shelly sand.	Boulders with dense Pomatoceros sp. Munida rugosa present, Nemertesia ramosa and Echinus sp. Flustra foliacea in patches.
19	15/10/2010	517985,17	6454712,34	518032,01	6454861,83	Very coarse pebbly, gravelly shelly sand, sandy gravel. Occasional small boulder. Areas of dense shell deposits.	Echinus sp., Pagurid crabs, small patches of Flustra foliacea.
20	15/10/2010	512273,93	6453712,12	512091,95	6453714,37	Very coarse hard compacted substrate. Sandy, gravelly, pebbly, cobbly substrate with small boulders and 'exposed bedrock'.	Echinus sp., dense Pomatoceros, hydroid tufts, scorpion fish and Asterias rubens.
21	15/10/2010	510074,05	6453847,69	509952,43	6453905,12	Cobbles, boulders and pebbles.	Flustra foliacea, Echinus sp., Asterias rubens, Pomatoceros sp., hydroids, crustose communities (bryozoans…), Munida rugosa.
22	14/10/2010	510044,45	6452370,37	509918,59	6452361,03	Shelly sand waves with dense surface deposits of pebbles and shell debris within the wave troughs. Some cobbles and small boulders. Transect becoming dense cobbly, shelly, pebbly substrate.	Dense Pomatoceros sp., Echinus sp., Asterias rubens.
23	14/10/2010	512128,03	6452117,62	512018,95	6452162,53	Rippled shelly sand with dense surface desposits of pebbles and cobbles. Occasional small boulder.	Lanice conchilega and Echinus sp.
24	14/10/2010	509253,86	6450649,64	509145,74	6450583,72	Rippled shelly sand with patches of coarse pebbly, shelly surface deposits. Extended areas of sandy, pebbly, shelly, coarse substrate.	Echinus sp., flatfish, Lanice conchilega, and Aequipecten opercularis.
25	14/10/2010	511213,97	6450174,44	511112,07	6450256,4	Shelly sand with Lanice conchilega. Some large patches of gravelly pebbly coarse substrate ?overlying shelly sand.	Lanice conchilega, Echinus sp., Aequipecten opercularis.
26	14/10/2010	514494,21	6451419,47	514383,32	6451498,61	Rippled shelly sand.	Lanice conchilega and hydroids tufts.
27	13/10/2010	514787,04	6449769,3	514648,71	6449813,53	Shelly (Glycymeris noted), gravel, (with Aequipecten), becoming rippled sand further along transect.	Aequipecten opercularis, Paguridae and hydroids.
28	13/10/2010	515665,29	6450041,7	515630,11	6449917,87	Rippled sand. Some shell, gravel, and cobbles. Occasional gravel patch.	Hydroids, Liocarcinus sp., worm tubes, Echinus sp., Paguridae.
29	14/10/2010	518164,95	6450986,52	518163,57	6451097,6	Shelly gravel with cobbles. Areas of rippled sand. Becoming shelly, pebbly, gravelly sand towards end of transect. Burrows present.	Aequipecten opercularis, Munida rugosa, Pagurid crabs, hydroids.
30	15/10/2010	519105,58	6452084,74	519007,68	6452151,48	Rippled shelly sand.	Gurnards, hydroid tufts, thick-backed sole.
31	15/10/2010	519182,04	6453145,01	519135,36	6453217,18	Rippled shelly sand.	Hydroid tufts. Haddock.
32	15/10/2010	514686,54	6453716,37	514570,84	6453808,22	Rippled shelly sand becoming shelly gravelly sand/sandy gravel waves with dense shell aggregations in the troughs. End of transect becomes rippled shelly sand again.	None noted.
33	14/10/2010	515530,83	6452084,21	515566,1	6452221,96	Rippled sand with patches of shelly gravel.	Hydroids, Pagurid crabs, Asterias rubens.

		Start		End		Field observations of substrate	Notes on observed fauna
Station ID	Date	Easting	Northing	Easting	Northing		
34	15/10/2010	516152,09	6454108,96	516152,54	6454179,5	Rippled shelly sand. Large shell debris on the surface. Patches of coarser sediment with pebbles.	Lanice conchilega present, hydroid tufts, and Pecten maximus.
35	14/10/2010	521158,8	6451733,74	521024,5	6451773,82	Rippled shelly sand.	Hydroid tufts. Haddock.
36	14/10/2010	522539,8	6452188,28	522402,82	6452152,19	Rippled compacted sand, with areas of shelly gravelly sand. Burrows present.	None noted.
37	14/10/2010	518667,51	6449792,95	518750,71	6449882,38	Rippled sand with burrows.	Pagurid crabs, hydroids, Nemertesia antennina, Aequipecten opercularis, and Ophiura sp.
38	13/10/2010	515724,97	6448964,66	515728,23	6449120,81	Rippled sand.	Callionymus sp., Asterias rubens, Aequipecten opercularis.
39	14/10/2010	519438,76	6449497,99	519433,33	6449609,17	Rippled sand. Large object noted on the sounder at about 150m SE of poisiton.	Liocarcinus sp., hydroids, Pecten maximus, Nemertesia sp.
40	14/10/2010	522162,63	6449563,2	522015,37	6449560,87	Cobbles and boulders on shelly, pebbly gravel. More sand as transect progresses.	Munida rugosa, Echinus sp., Aequipecten opercularis.
41	14/10/2010	524690,04	6450281,51	524580,92	6450227,21	Rippled compacted sand.	Gurnard and Aequipecten opercularis.
42	14/10/2010	523468,9	6449487,09	523341,16	6449535,68	Rippled sand with burrows.	Liocarcinus sp., Ophiura sp.
43	13/10/2010	516647,35	6448531,48	516772,02	6448630,16	Rippled sand.	Callionymus sp, Asterias rubens.
44	13/10/2010	516029,56	6448045,37	516078,53	6448177,02	Slightly gravelly rippled sand.	Nemertesia sp., Asterias rubens, worm tubes, Aequipecten opercularis.
45	13/10/2010	516443,67	6447232,53	516471,53	6447360,86	Rippled sand.	Worm tubes, Callionymus sp., and Liocarcinus sp. present.
46	13/10/2010	514537,21	6447197,08	514427,12	6447242,6	Rippled sand with occasional patches of sand waves. Changes to more shelly gravel with boulders in the central area.	Liocarcinus sp., Echinus sp., Flustra foliacea, hydroids, shrimps, and Metridium senile.
47	13/10/2010	513352,59	6447192,36	513249,73	6447261,72	Sand waves with patches of cobbles, boulders, shells and gravel. Some areas of rippled sand.	Ray.
48	13/10/2010	511896,28	6447444,07	511851,81	6447536,2	Rippled sand. End of transect with pebbles and stony deposits.	Occasional hydroids and flatfish.
49	14/10/2010	510729,71	6448445,46	510693,42	6448525,78	Cobbly pebbly ground.	Alcyonium digitatum, Echinus sp., and Asterias rubens.
50	12/10/2010	509841,31	6446539,08	509840,75	6446420,02	Cobbly, pebbly gravel.	Echinus sp, Aequipecten opercularis, Pomatoceros sp., Bryo/hydro turf, Munida rugosa, Thick-backed sole, Liocarcinus sp., Pagurid crabs.
51	14/10/2010	524603,61	6454265,23	524501	6454181,82	Rippled compacted sand.	Pagurid crabs, Aequipecten opercularis and Liocarcinus sp.
52	11/10/2010	505873,61	6436395,53	505979,16	6436293,06	Rippled sand. Burrows present and surface deposits of Ensis shells.	Observed fauna were Paguridae, Liocarcinus sp., gurnard fish, Aequipecten opercularis, Flustra folicaea, Pecten maximus and Crustacea tracks. Burrows present and surface deposits of Ensis shells.
53	11/10/2010	507117,41	6437281,66	506945,67	6437260,67	Rippled sand. Burrows present.	Observed fauna were Paguridae, crustacea tracks, Lanice tubes, Liocarcinus sp.. Burrows present.
54	11/10/2010	507645,01	6438216,52	507772,44	6438218,96	Very coarse hard ground of cobbles, pebbles, and gravel, with some sand evident, and small boulders.	Dense Pomatoceros sp. and some hydroid tufts. Cancer pagurus present.
55	11/10/2010	509088,56	6437153,61	509203,76	6437323,97	Boulders present on cobbly, shelly sand.	Observed fauna were Liocarcinus sp., Aequipecten opercularis, Pomatoceros sp., Agonus cataphractus, Munida sp, and hydroid tufts.
56	11/10/2010	509266,4	6438945,17	509388,48	6439021,39	Cobbly, shelly, gravelly sand.	Small patches of Flustra folicaea on cobbles and some minor hydroid tufts.
57	12/10/2010	509015,54	6440127	508947,68	6440316,69	Coarse compacted sediment appearing to be cobbly shelly sand with some shell hash.	Various crabs evident.
58	12/10/2010	510892,68	6441168,88	510950,04	6441056,67	Compacted shelly sand. Surface deposits of shells in places.	Hydroid tufts present.
59	12/10/2010	509816,53	6441936,5	509868,75	6441842,61	Compacted coarse substrate of cobbly, pebbly, gravelly shelly sand. Surface deposits of large shell debris.	Hydroid tufts and Pagurid crabs.
60	12/10/2010	512027,5	6442212,91	512043,03	6442085,93	Rippled shelly sand with Lanice conchilega. Becomes coarser, more compacted shelly sand with pebbles. Further along the transect, becomes a very coarse mixed ground of cobbly, pebbly, shelly gravel, with dense deposits of dead shell.	Lanice conchilega, Munida rugosa and Thick-backed sole visible.
61	12/10/2010	512795,97	6439886,57	512860,7	6440019,01	Compacted ground appearing to be gravelly, shelly sand.	Cancer pagurus present. Some hydroid tufts.
62	12/10/2010	509629,7	6443313,97	509703,13	6443437,09	Rippled sand with shell. Occasional cobble and boulder.	Liocarcinus sp. Asterias rubens, crustacea tracks, Pagurid crabs, and Lanice conchilega present.
63	12/10/2010	510067,38	6443099,21	510194,8	6443158,23	Rippled sand with shell.	Pagurid crabs and Asterias rubens present.
64	12/10/2010	510915,62	6443334,37	510991,43	6443474,02	Clean' rippled sand with Lanice conchilega, potentially sand waves in places. Shell deposits in troughs. Closer to datum becoming slightly gravelly sand.	Asterias rubens, Pagurid crabs, Liocarcinus sp., and sand eels present.
65	12/10/2010	511352,75	6443367,35	511399,71	6443524,92	Patchy habitat. Rippled sand approaching datum, occasionally appearing as waves, then crossing several distinct patches of coarse shelly sandy gravel. Shell deposits in troughs.	Sand eels, Liocarcinus sp, Pagurid crabs and Lanice conchilega present.
66	12/10/2010	509933,86	6444798,08	509918,03	6444690,72	Sand waves with shell, gravel, pebbles and occasionally a boulder present.	Aequipecten opercularis, Munida rugosa, Crossaster papposus and flatfish present.
67	12/10/2010	512887,78	6445255,48	512930,55	6445404,85	Shell deposits on gravel with some cobbles. Some patches of sand.	Thick-backed sole, gurnard fish, Flustra foliacea, Hydro/Bryo turf, Asterias rubens, Munida rugosa, Hydrallmania falcata, Aequipecten opercularis, Liocarcinus sp, and ?Henricia sp.

Appendix II Seabed Photos - low res

		Start		End			
Station ID	Date	Easting	Northing	Easting	Northing	Field observations of substrate	Notes on observed fauna
68	12/10/2010	512433,71	6443587,55	512491,35	6443713,48	Shell deposits on sandy gravel.	Asterias rubens, Liocarcinus sp, Flustra folicaea, Aequipecten opercularis, Hydroids, Paguridae, Echinus sp.
69	12/10/2010	514138,15	6442412,04	514157,13	6442278,6	Compacted sediment of shelly sand. Areas of dense deposits of dead shells.	Lanice conchilega. Areas of dense deposits of dead shells with Munida sp. evident amongst it.
70	12/10/2010	514782,27	6445458,26	514881,4	6445563,88	Patchy habitat. Rippled sand with shell deposits and some gravel.	Munida rugosa, Asterias rubens, Echinus sp, Pagurid crabs, Callionymus sp. and Liocarcinus sp.
71	12/10/2010	517108,88	6442907,05	517131,98	6442765,08	Compacted sediment of shelly sand. Patches of dense shell deposits (fishing debris?), and coarse mixed ground.	Pagurus sp. evident and areas of dense Lanice conchilega.
72	12/10/2010	515912,37	6440876,49	515989,03	6441032,86	Compacted sediment appearing to be shelly sand with surface shell deposits.	Hydroid tufts, Crossaster papposus and Aequipecten opercularis present.
73	12/10/2010	517594,58	6440478,97	517717,08	6440558,82	Compacted sediment appearing to be rippled shelly sand.	Crabs and hydroid tufts present. Pennatula phosphorea and Virgularia mirablilis noted, with V.mirabilis appearing dominant.
74	12/10/2010	519782,62	6441813,51	519866,22	6441727,56	Consolidated shelly sand with deposits of dead shells lying in tracks along the seabed.	None noted.
75	13/10/2010	519239,89	6443989,78	519261,83	6443888,54	Rippled' shelly sand.	Lanice conchilega, gurnard fish, Callionymus sp., Pagurid crabs and hydroid tufts present.
76	13/10/2010	518919,07	6446140,37	518932,89	6446252,05	Consolidated hard ground of cobbly, pebbly, sandy, shelly substrate becoming shelly sand further along the transect.	Echinus sp., notable amounts of hydroids, and Pomatoceros dense on the cobbles.
77	13/10/2010	520707,14	6445812,09	520691,28	6445703,99	Consolidated shelly sand with surface shell deposits. Large boulder present.	Aequipecten opercularis and hydroids present.
78	13/10/2010	521059,66	6443750,41	521065,13	6443906,56	Coarse shell deposits on shelly sand. As transect progresses, becomes an area of compacted sediment of shelly sand, with large shell debris.	Lanice conchilega, hydriod tufts, and a notable amount of haddock seen.
79	13/10/2010	522512,24	6442902,25	522514,47	6443050,26	Compacted shelly rippled sand.	Hydroid tufts and Liocarcinus sp.. Haddock visible.
80	13/10/2010	523681,5	6442757,49	523679,45	6442907,55	Consolidated shelly sand.	Lanice conchilega, Liocarcinus sp. and hydroid tufts. Pennatula phosphorea present in places.
81	13/10/2010	521892,99	6445552,48	521890,16	6445457,96	Shelly sand appearing very consolidated at the start of the transect.	Pecten maximus, hydroids, and haddock noted.
82	13/10/2010	521602,79	6446975,77	521655,73	6447094,92	Shelly sand with Lanice conchilega. Some areas of dense consolidated cobbly, pebbly, shelly sand. Lots of surface deposites of broken shell.	Aequipecten opercularis, haddock, and hydroid tufts present.
83	13/10/2010	524714,38	6445698,92	524717,45	6445861,42	Shelly sand with surface shell deposits. Along transect becoming coarse consolidated pebbly, shelly sand.	Hydroids, Pagurid crabs, and shoals of haddock. Echinus sp., present and occasional Pennatula phosphorea.
84	16/10/2010	525204,51	6468367,14	525187,27	6468509,53	Sand waves, some with cobble and boulder deposits. Gravel and pebbles in gullies.	Flustra foliacea, Echinus sp., Pagurid crabs,
85	16/10/2010	525842,05	6466354,22	525929,67	6466460,57	Cobbles and angular boulders on rippled sand.	Echinus sp., Flustra foliacea. Haddock present.
86	16/10/2010	525512,19	6464948,28	525628,54	6464981,71	Sand waves.	Pagurid crabs, tubes present.
87	14/10/2010	507517,76	6448447,25	507531,51	6448581,17	Rippled shelly sand, some areas of sand waves. Some heavy shell deposits in the troughs.	Flatfish, Lanice conchilega, sand eels, and Cancer pagurus.
88	12/10/2010	508669,05	6444626,09	508649,85	6444515,73	Overall rippled sand with shell. At the start of the transect included gravel, and the occasional boulder.	Pagurid crabs, Asterias rubens, Liocarcinus sp., and gurnard fish present.

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Appendix II Seabed photographs

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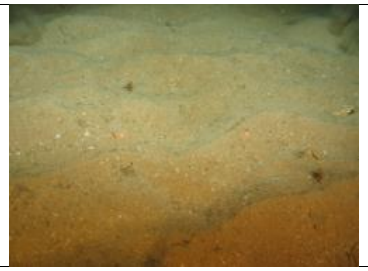
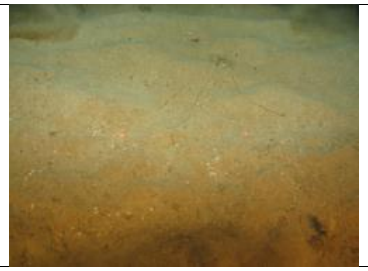
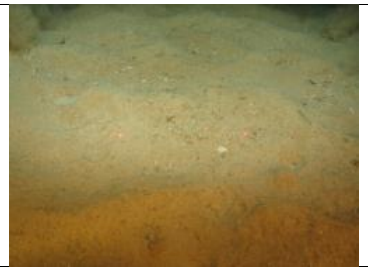
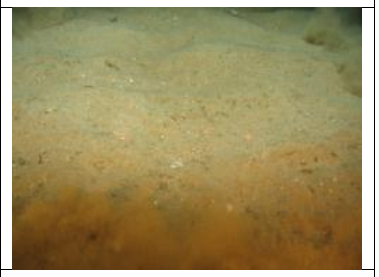
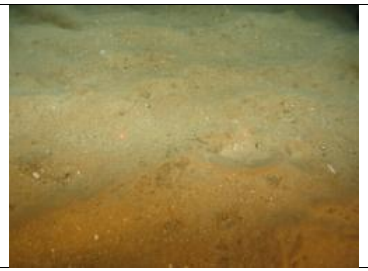
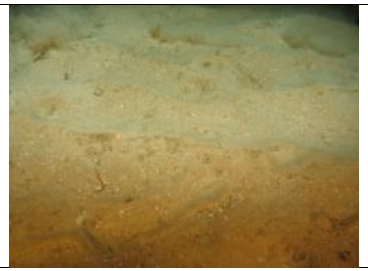
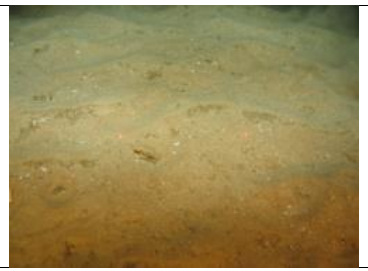
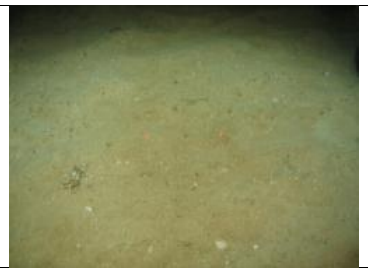
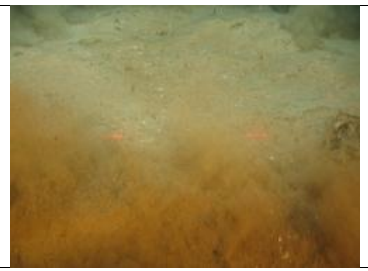
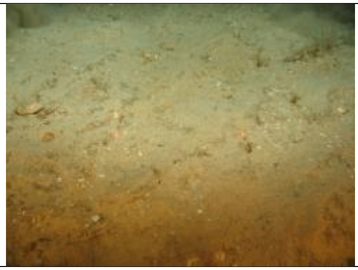
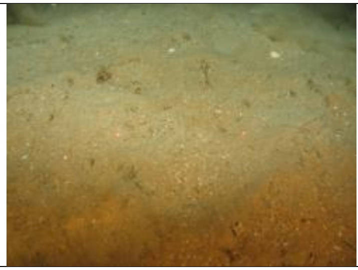
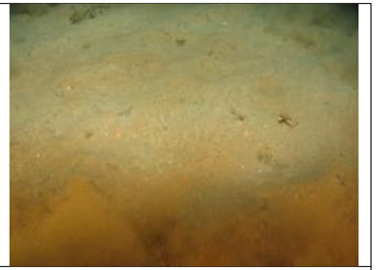
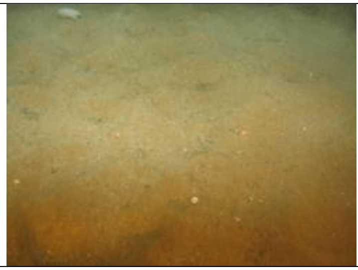
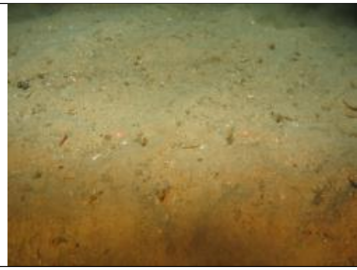
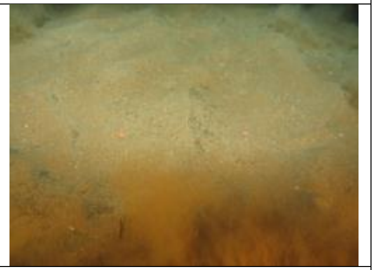
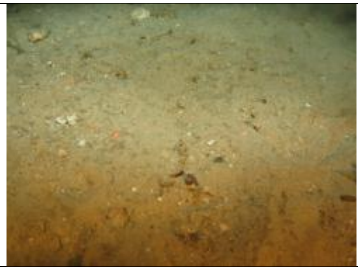
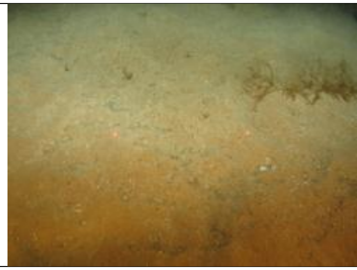
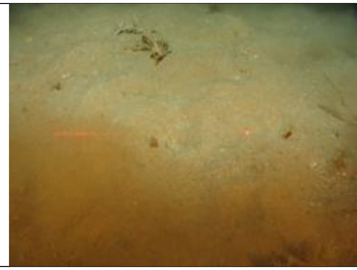
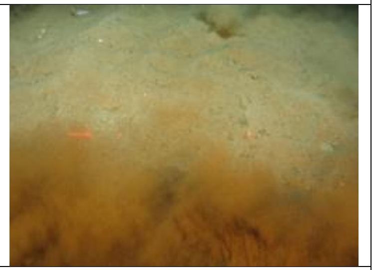
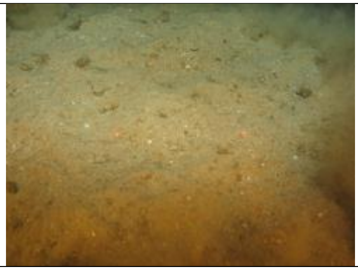
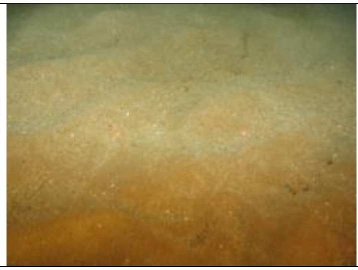
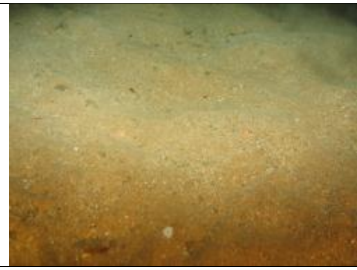
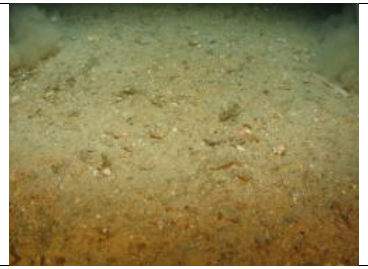
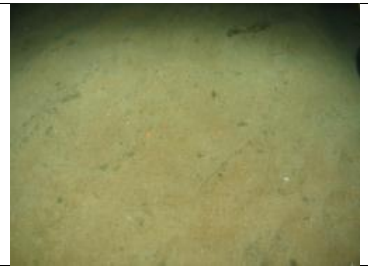
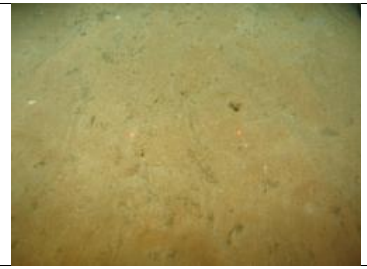
1					
2					
3					
4					

5					
6					
7					
8					

9					
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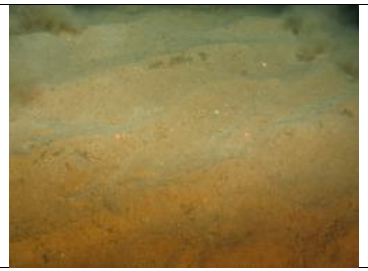
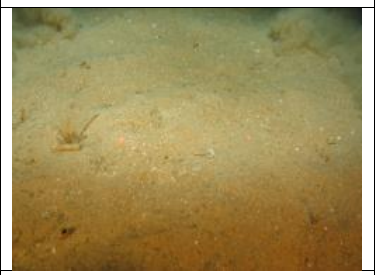
11					
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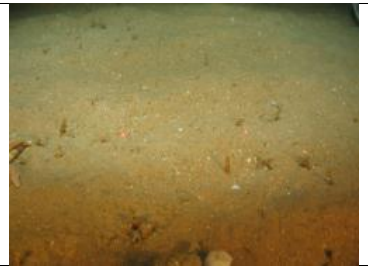
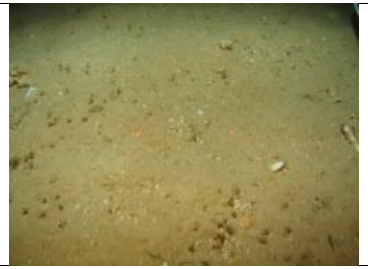
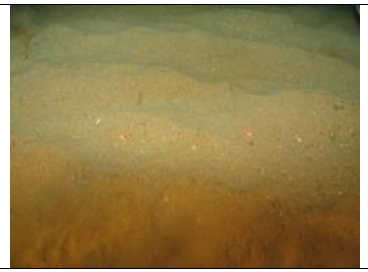
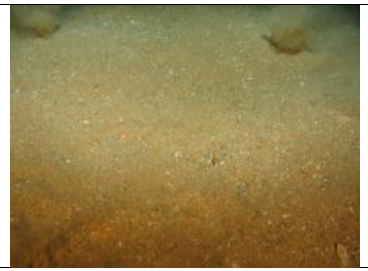
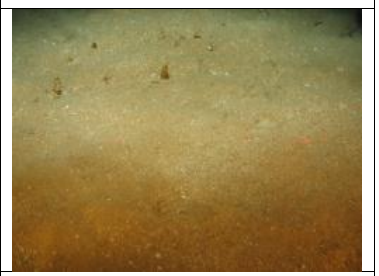
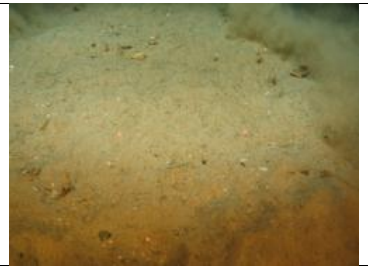
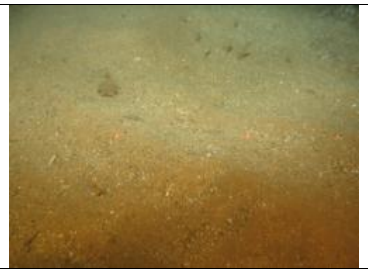
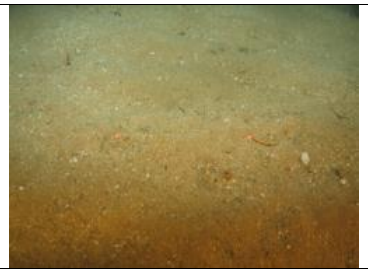
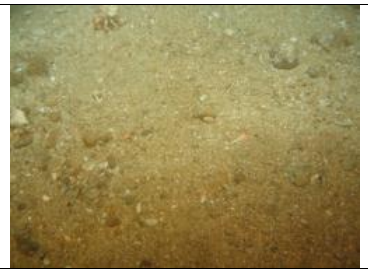
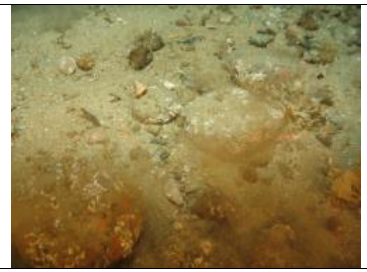
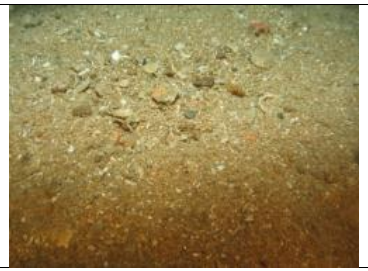
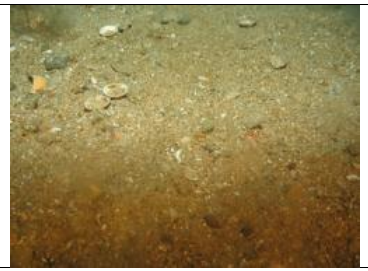
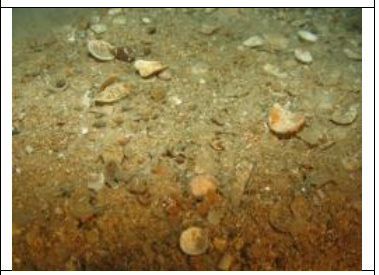
13					
14					
15					
16					

17					
18					
19					
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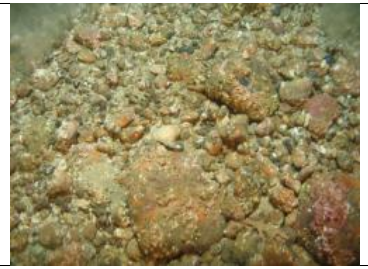
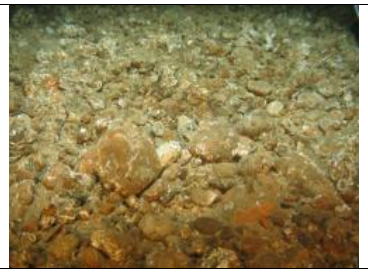
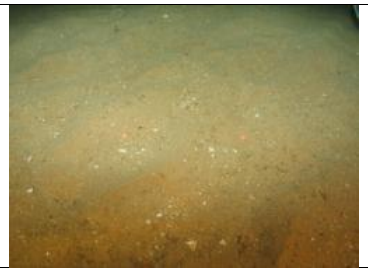
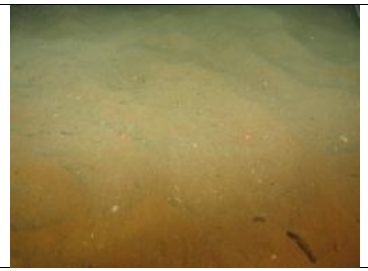
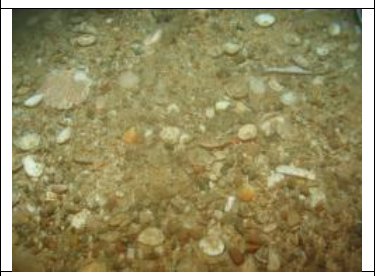
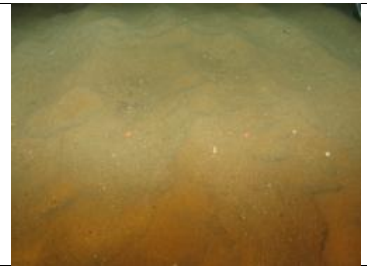
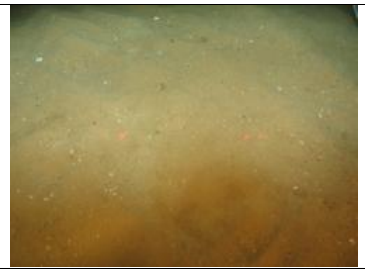
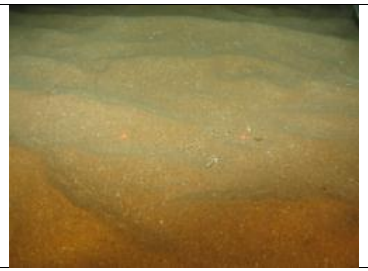
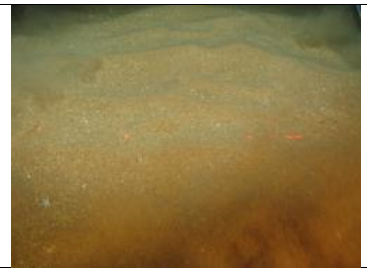
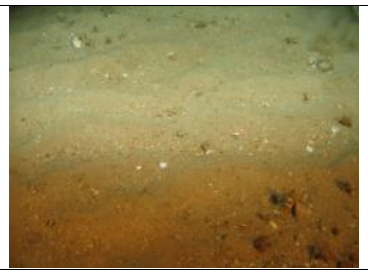
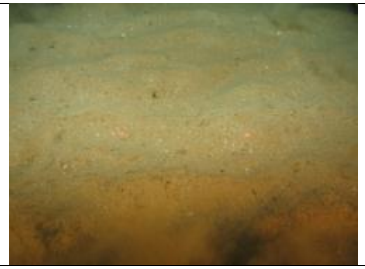
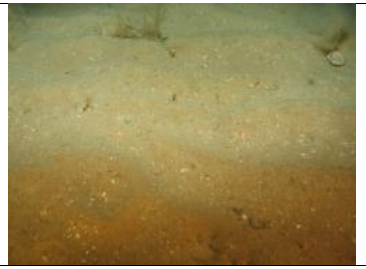
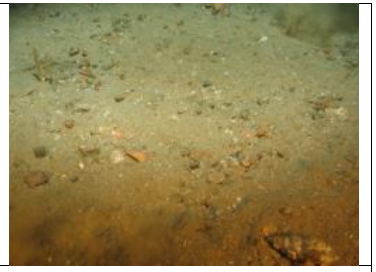
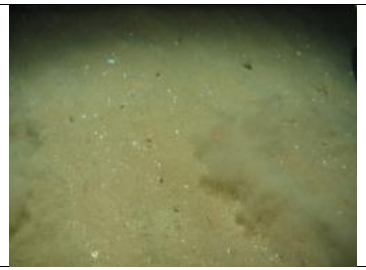
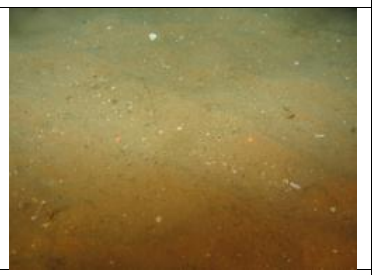
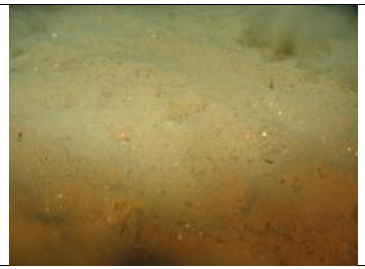
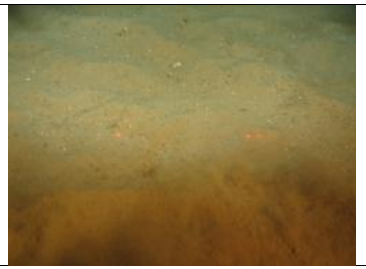
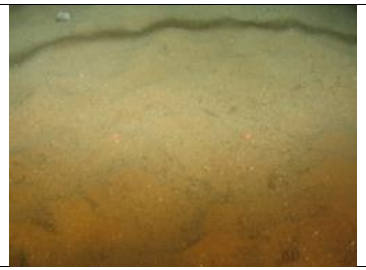
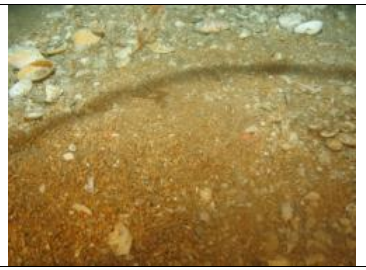
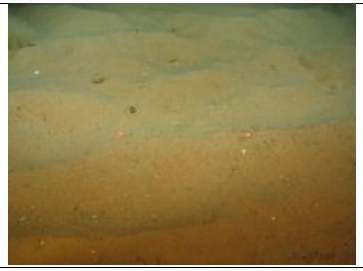
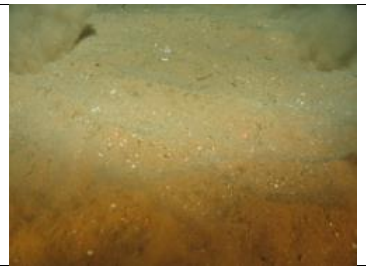
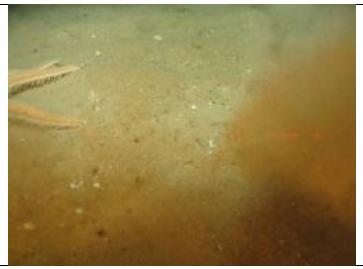
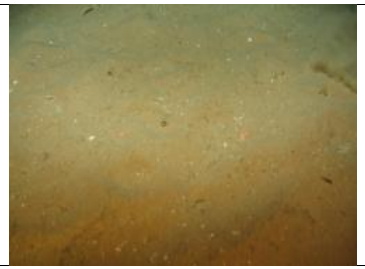
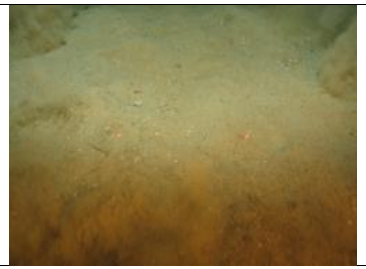
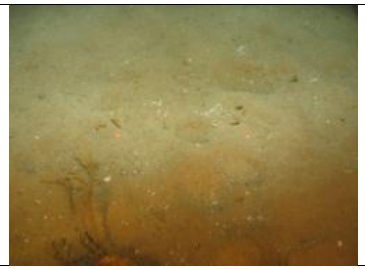
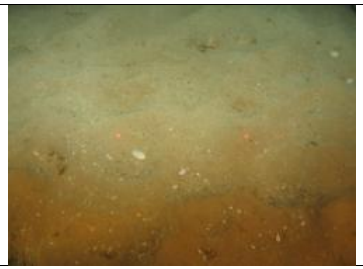
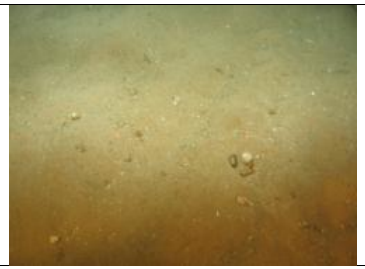
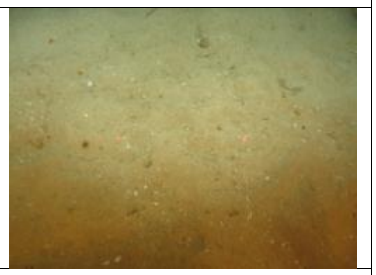
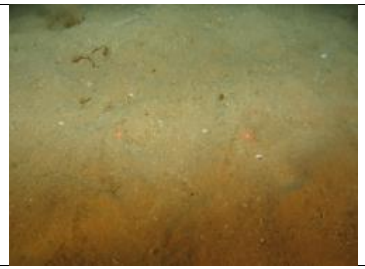
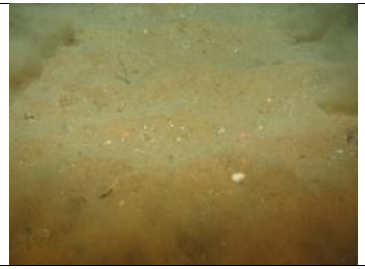
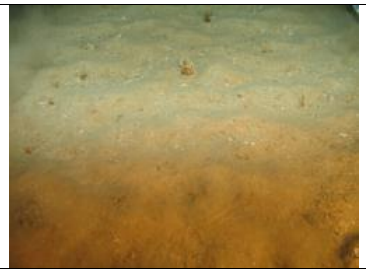
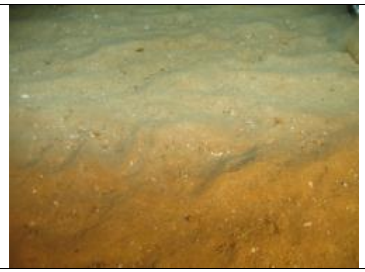
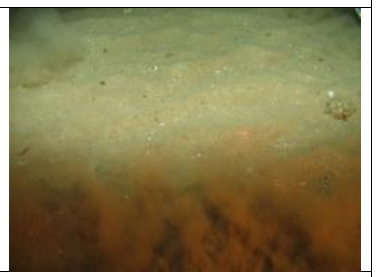
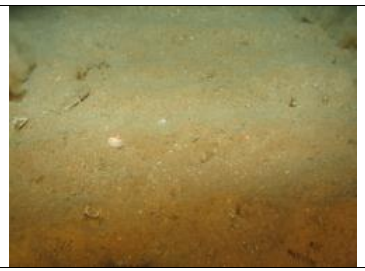
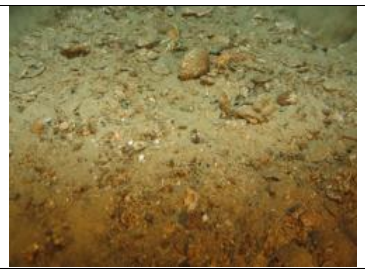
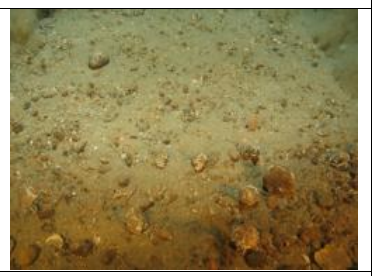
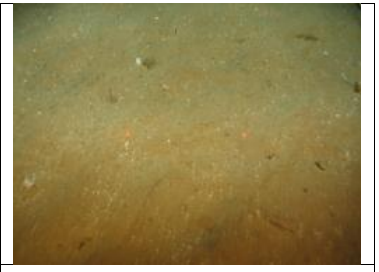
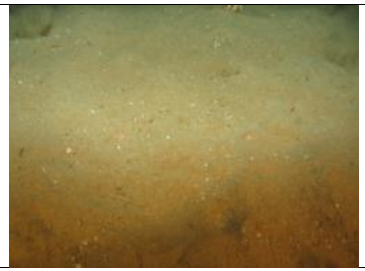
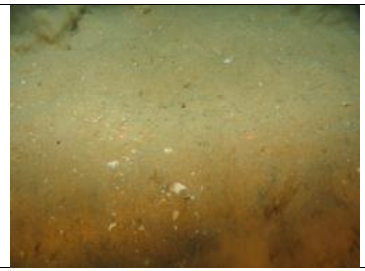
21					
22					
23					
24					

25					
26					
27					
28					

29					
30					
31					
32					

33					
34					
35					
36					

37					
38					
39					
40					

41					
42					
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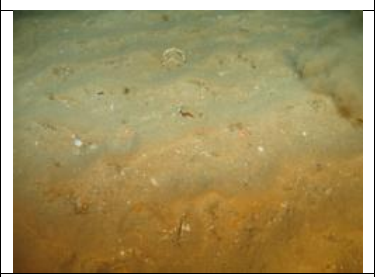
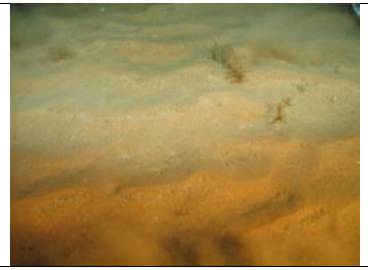
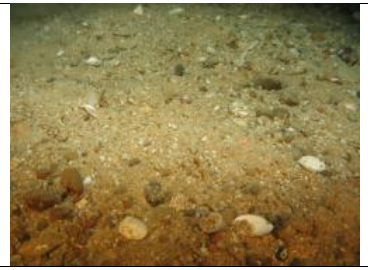
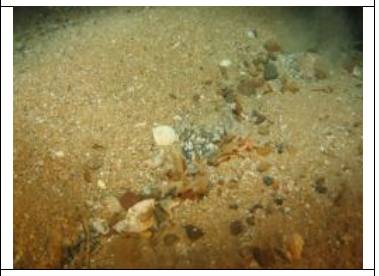
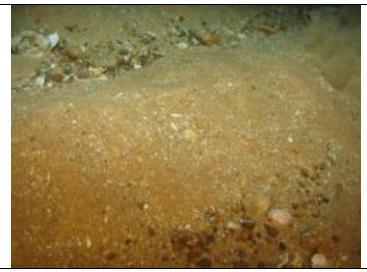
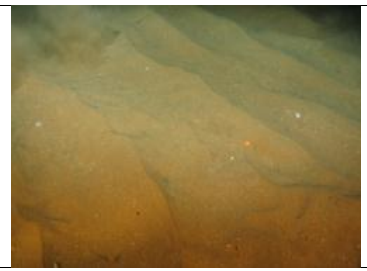
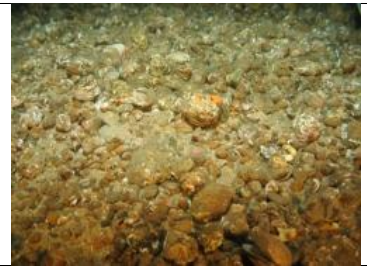
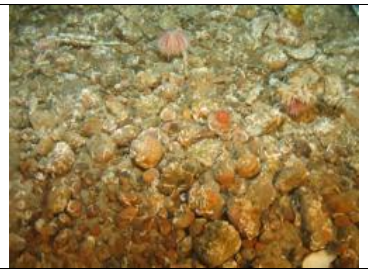
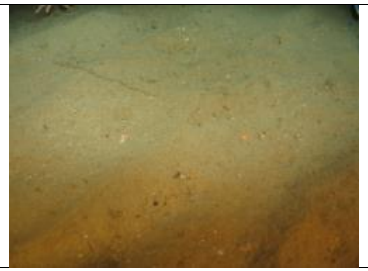
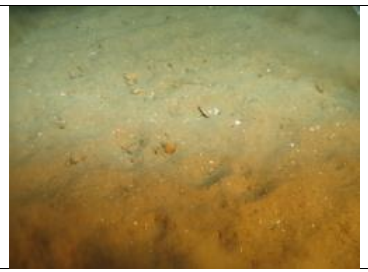
44					

45					
46					
47					
48					

49					
50					
51					
52					

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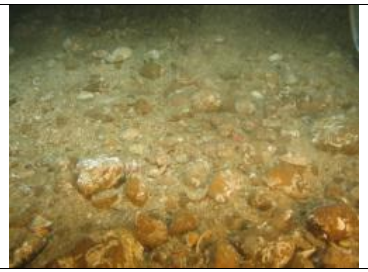
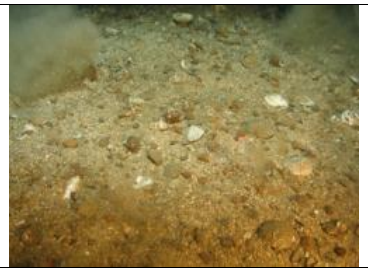
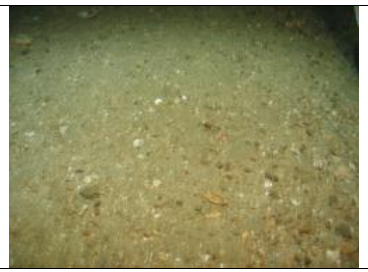
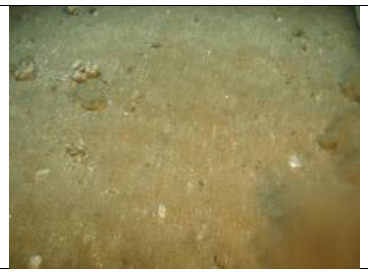
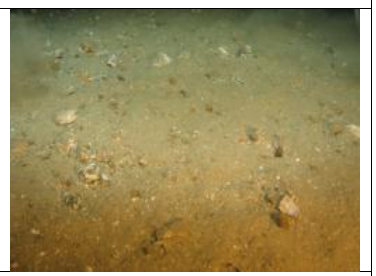
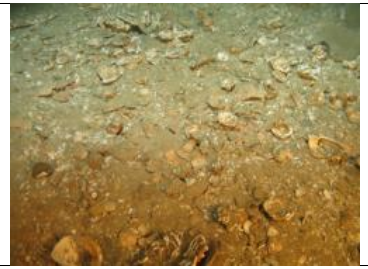
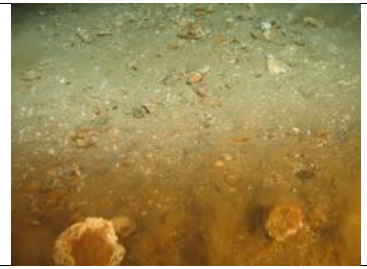
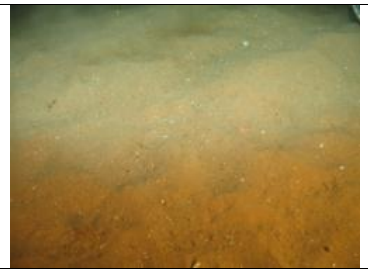
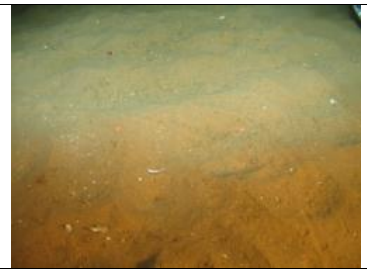
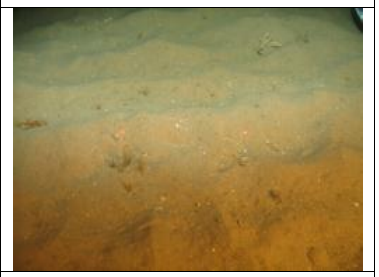
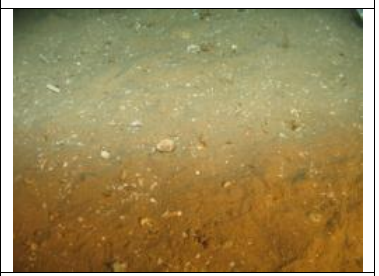
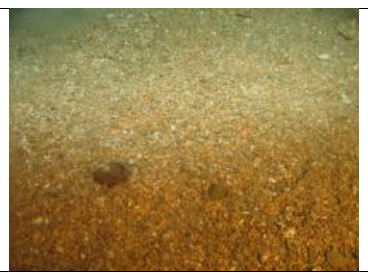
54					
55					
56					

57					
58					
59					
60					

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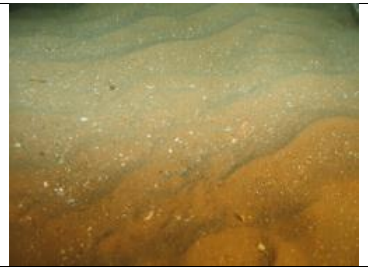
62					
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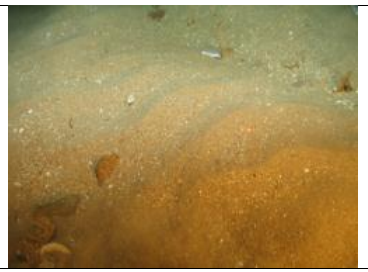
64					

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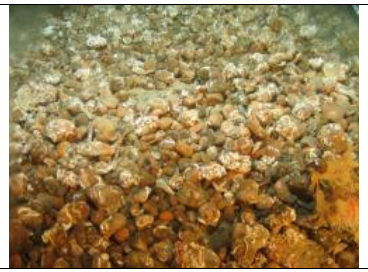
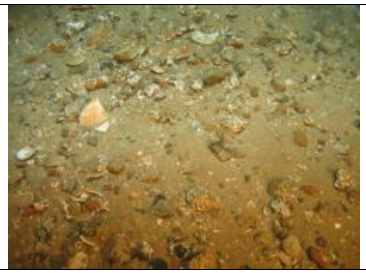
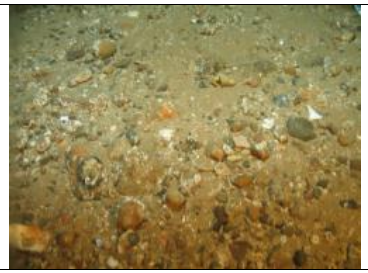
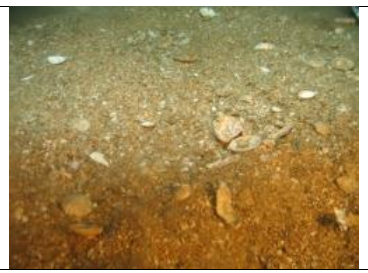
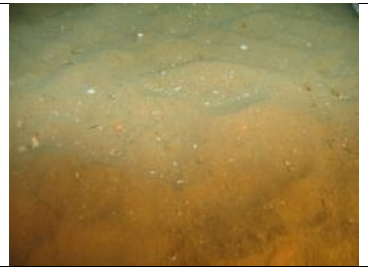
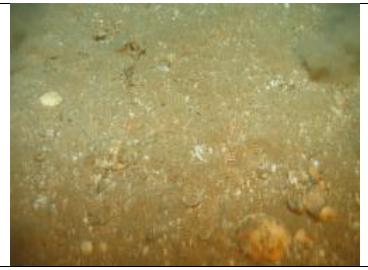
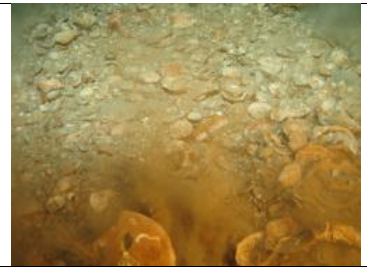
67					
66					
68					

69					
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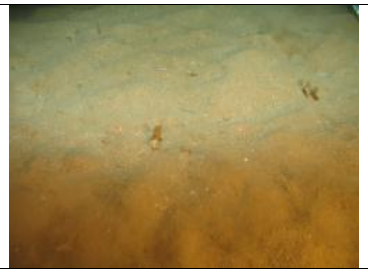
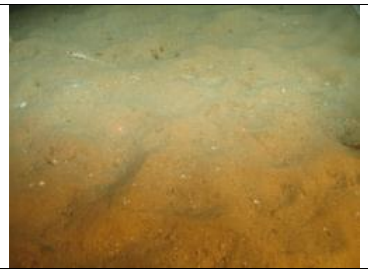
71					
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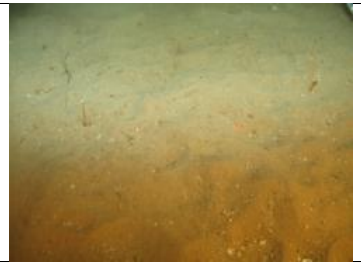
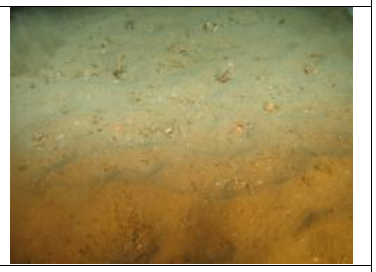
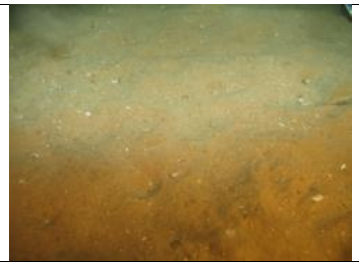
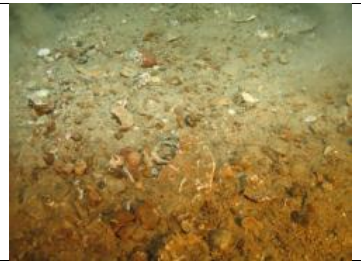
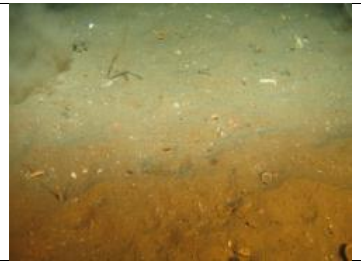
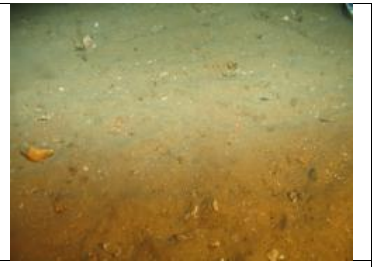
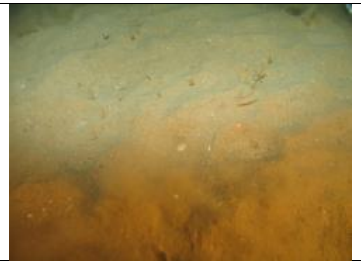
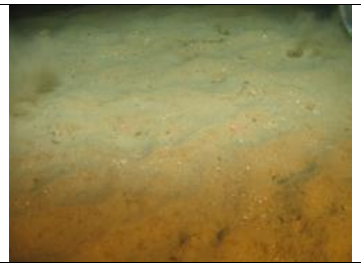
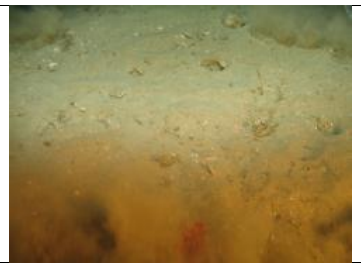
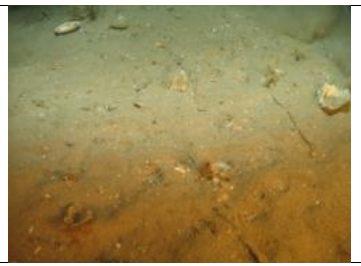
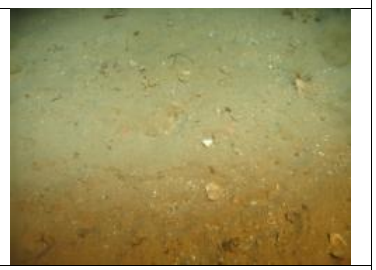
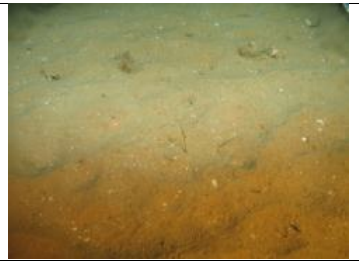
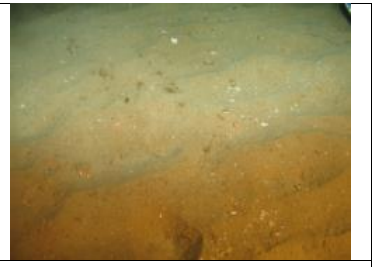
73					
74					
75					
76					

77					
78					
79					
80					

81					
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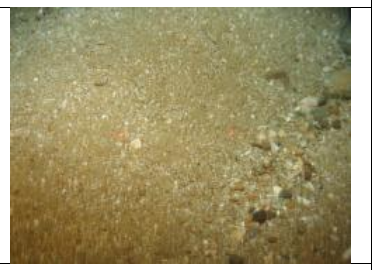
84 Reference					

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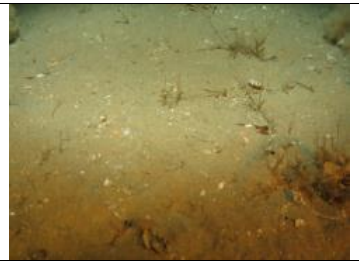
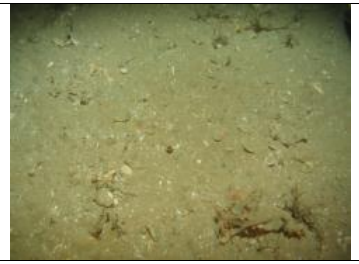
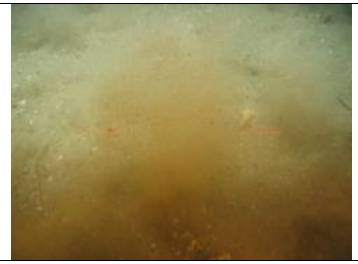
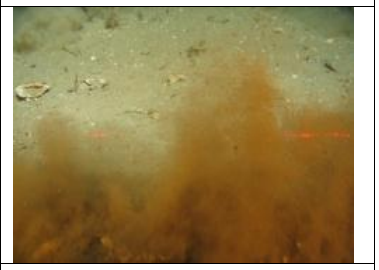
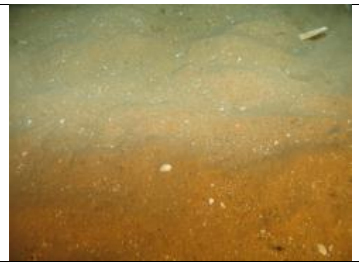
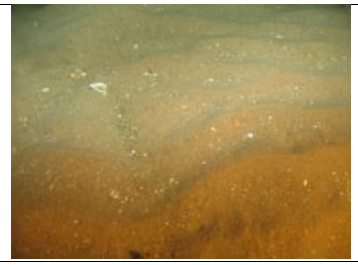
87					
88					

Appendix III Photographs of grab samples

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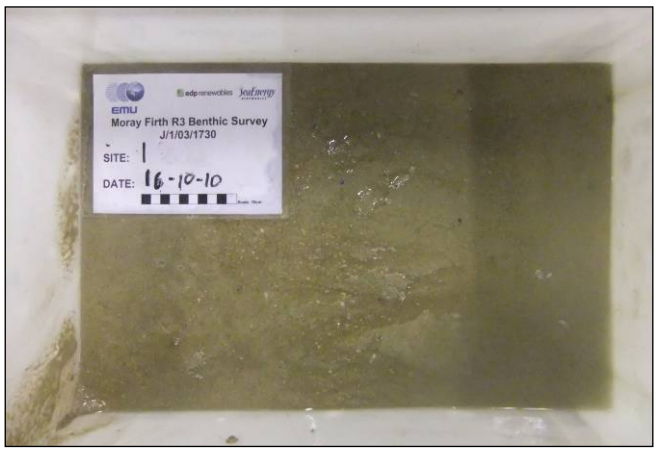

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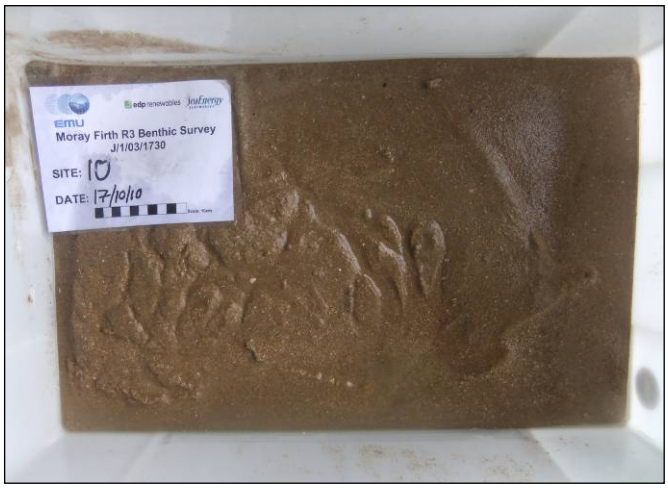

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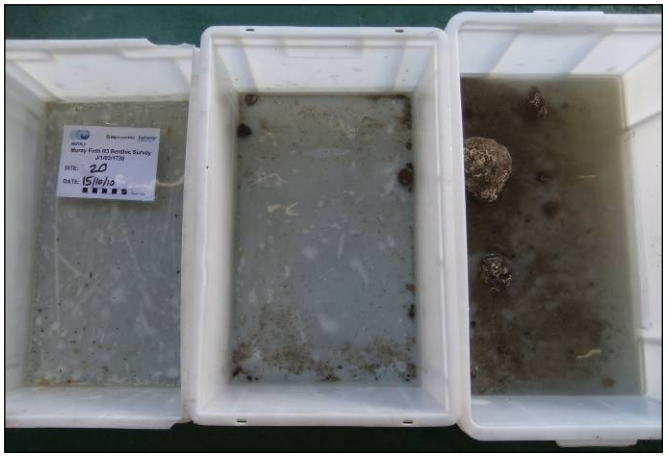

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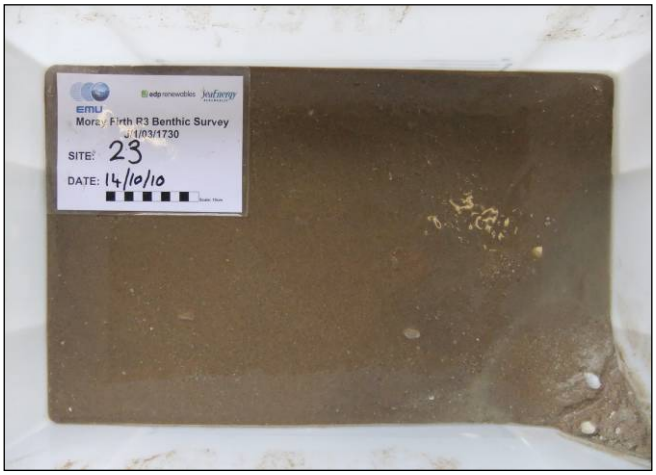

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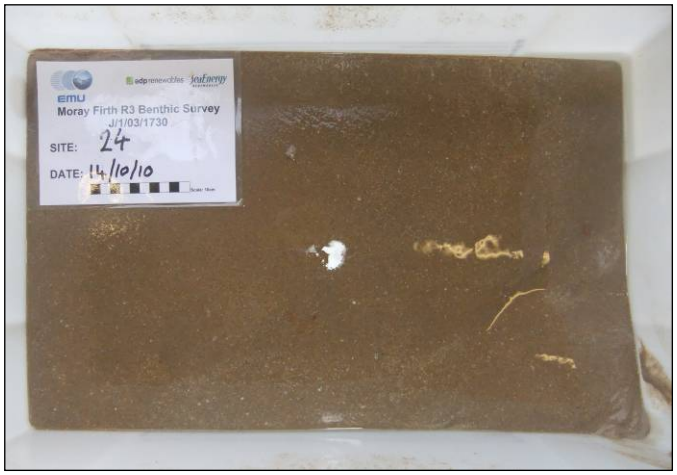

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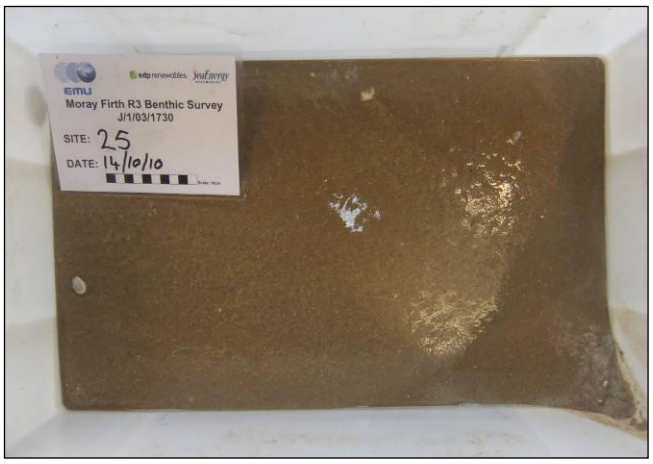

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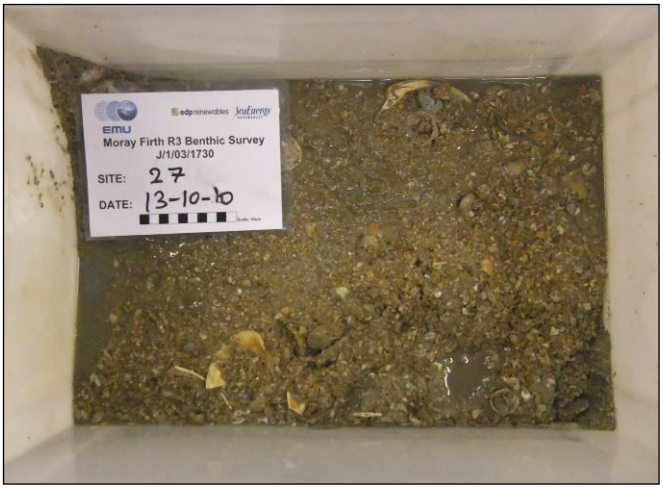

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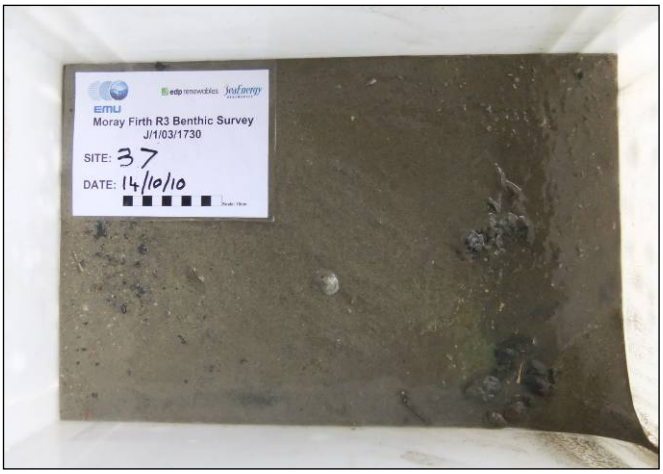

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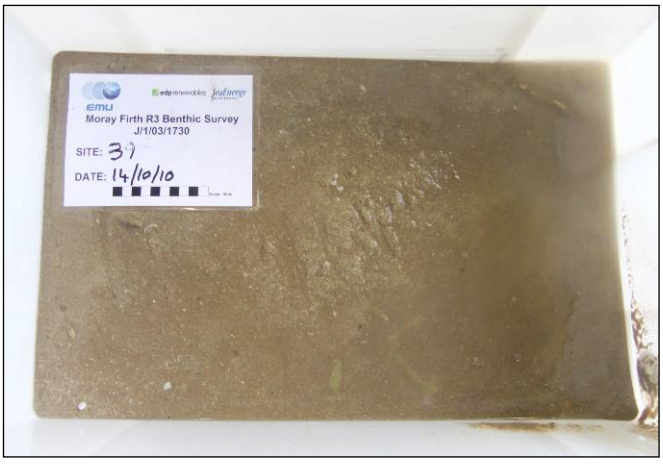

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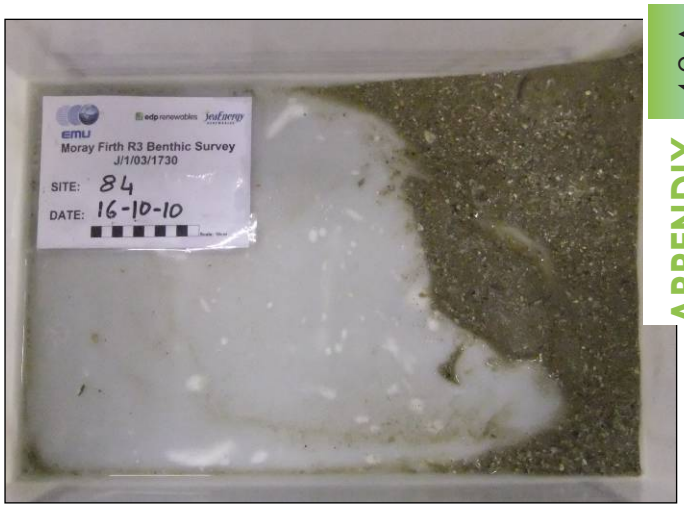

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Appendix IV Trawl sample locations and field observations

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Appendix IV
Moray R3 Stevonson, Telford & MacColl sites. Benthic ecology characterisation
2 m beam trawl sample locations and field observations

Site No	Date	Point on line	WGS84 UTM (Z30N)		Time (GMT)	Depth (BCD m)	Length of wire out	Trawl Speed	Distance (m)	Volume (l)	Direction of Travel	Comments
			Easting	Northing								
T1	17/10/10	Start	515060,11	6459994,86	13:25	48	150	2,7	512	10	Into current	Buccinum eggs, chaetopterus tube, fishing twine, Lanice tubes, drift algae
		End	514741,03	6459594,82	13:32	48,1						
T2	16/10/10	Start	515320,13	6462835,05	22:21	52,2	165	2,2	481	9	Into current	Chaetopterus tube, drift algae
		End	515000,71	6462475,60	22:29	51,5						
T3	17/10/10	Start	518645,51	6458599,60	9:45	47,5	160	1,9	519	11	Across current (slight)	Lobster pot rope, chaetopterus tubes, drift algae
		End	518315,43	6458198,84	9:53	47,2						
T4	17/10/10	Start	512588,95	6459040,73	14:16	47,1	150	2,8	506	12	Into current	Drift algae, whelk eggs, fishing twine
		End	512263,42	6458653,35	14:23	48,6						
T5	17/10/10	Start	521899,40	6457791,73	8:29	53,3	160	2,3	512	15	Across current	Squid eggs, drift algae
		End	521584,73	6457387,79	8:37	49,1						
T6	14/10/10	Start	514294,27	6451280,56	11:59	45,8	140	2,5	489	6	Into current / Slack water	Drift algae
		End	514648,86	6451617,87	12:06	46,7						
T7	15/10/10	Start	516251,52	6454320,77	7:43	48,1	150	2,1	508	11	Across current	
		End	515910,18	6453944,54	7:50	46,7						
T8	14/10/10	Start	518541,26	6449715,24	15:28	52,7	165	2,4	471	7	Into current	Wood
		End	518894,93	6450026,01	15:34	54,5						
T9	14/10/10	Start	523541,60	6449680,14	19:56	54,8	165	2,6	491	8	Across current	Wood
		End	523192,13	6449334,62	20:03	55,2						
T10	14/10/10	Start	510526,82	6448210,57	2:16	42,2	120	2,4	528	30	Into current	Drift algae, twine
		End	510860,79	6448619,43	2:23	41,4						
T11	14/10/10	Start	524736,23	6454445,22	21:53	58,4	180	2,4	511	6	Into current	Wood, rope, drift algae
		End	524393,11	6454065,97	22:00	56,7						
T12	11/10/10	Start	505987,76	6436552,42	20:23	51,7	150	2,3	490	17	Across current	Chaetopterus tube, bivalve tube
		End	505698,89	6436156,76	20:30	52,3						
T13	11/10/10	Start	509469,29	6439150,31	21:30	45,9	140	2,3	507	37	Across current	Drift algae - Ascophyllum, Polysiphonia sp., cat shark egg cases
		End	509136,08	6438767,79	21:37	44,8						
T14	12/10/10	Start	511525,56	6443573,90	22:20	43,0	130	2,4	501	20	Into current	Cat shark egg
		End	511196,26	6443196,09	22:27	43,0						
T15	12/10/10	Start	512775,59	6445201,98	16:38	42,0	130	2,5	510	22	Into current	
		End	513120,27	6445577,39	16:45	43,2						
T16	13/10/10	Start	519182,24	6443840,21	10:00	52,8	160	2,1	497	8	Across current	Chaetopterus tubes
		End	519489,99	6444230,51	10:07	52,1						
T17	13/10/10	Start	518802,78	6446008,52	12:10	49,8	150	2,1	515	33	Into current	Chaetopterus tubes, Lanice tubes
		End	519130,31	6446406,29	12:17	49,2						
T18	13/10/10	Start	522008,18	6445664,76	7:13	54,6	150	2,0	501	8	Across current	Drift algae, chaetopterus tubes
		End	521667,15	6445298,20	7:20	54,1						
T19	16/10/10	Start	525705,24	6465172,94	19:29	49,3	150	2,4	524	19	Across current	Rope, chaetopterus tubes, drift algae, Lanice tubes
		End	525384,28	6464759,23	19:37	50,3						
T20	14/10/10	Start	507351,34	6448272,38	6:15	39,0	120	2,3	547	10	Across current	
		End	507751,19	6448646,29	6:23	39,4						
T21	12/10/10	Start	508775,28	6444784,43	21:43	41,7	130	2,4	497	14	Across current	
		End	508499,34	6444370,65	21:50	40,3						

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Appendix V Photographs of trawl samples

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Trawl 1

Trawl 2

Trawl 3

Trawl 4

Trawl 5

Trawl 6

Trawl 7

Trawl 8

Trawl 9

Trawl 10

Trawl 11

Trawl 12

Trawl 13

Trawl 14

Trawl 15

Trawl 16

Trawl 17

Trawl 18

Trawl 19

Trawl 20


edp renewables
EMU
Moray Firth R3 Benthic Survey
J/1/03/1730
SITE: T21
DATE: 12-10-10

Trawl 21

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Appendix VI Results of the particle size distribution data

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Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	1	2	3	4	5	6	7	8	9	10
EMU Lab ID	6883	6884	6885	6886	6887	6888	6889	6890	6891	6892
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	37,25	0,00	0,00
16000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	21,56	0,00	0,00
8000	0,00	0,03	1,02	0,00	0,79	4,38	0,00	5,12	0,00	0,00
4000	0,35	0,43	0,29	0,05	1,08	1,10	1,47	3,14	0,01	0,00
2000	2,25	0,95	1,20	0,86	3,08	2,82	2,21	4,26	0,27	0,24
1000	4,11	1,49	2,72	1,29	6,41	4,86	2,77	5,38	1,09	1,68
500	6,63	6,06	4,27	2,31	10,53	7,60	3,98	6,34	5,11	6,88
250	31,29	50,40	18,72	21,97	31,03	25,99	25,50	11,52	35,95	43,76
125	45,02	35,84	60,27	61,86	39,55	47,15	54,62	4,52	52,38	44,17
63	7,82	1,48	9,21	9,09	5,17	4,35	7,27	0,25	3,61	1,92
<63	2,52	3,32	2,30	2,57	2,37	1,75	2,19	0,66	1,58	1,35
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistics

Station No.	1	2	3	4	5	6	7	8	9	10
EMU Lab ID	6883	6884	6885	6886	6887	6888	6889	6890	6891	6892
% Gravel	2,6%	1,4%	2,5%	0,9%	4,9%	8,3%	3,7%	71,3%	0,3%	0,2%
%Sand	94,9%	95,3%	95,2%	96,5%	92,7%	90,0%	94,1%	28,0%	98,1%	98,4%
% Silt/Clay	2,5%	3,3%	2,3%	2,6%	2,4%	1,7%	2,2%	0,7%	1,6%	1,3%
Mean (mm)	0,25	0,27	0,22	0,21	0,31	0,30	0,23	7,81	0,24	0,26
Md (mm)	0,23	0,28	0,19	0,19	0,27	0,24	0,21	21,24	0,23	0,26
Mean (phi)	2,03	1,88	2,21	2,28	1,71	1,74	2,12	-2,97	2,07	1,94
Md (phi)	2,12	1,81	2,36	2,38	1,91	2,07	2,26	-4,41	2,14	1,94
Sorting (phi)	1,07	0,79	0,97	0,76	1,27	1,47	1,04	2,87	0,74	0,77
Skq	-0,20	0,01	-0,29	-0,11	-0,27	-0,49	-0,30	0,64	-0,19	-0,10
Kurtosis	1,29	0,97	1,64	1,30	1,26	1,62	1,48	0,65	0,87	0,90

Descriptive Statistics

Station No.	1	2	3	4	5	6	7	8	9	10
EMU Lab ID	6883	6884	6885	6886	6887	6888	6889	6890	6891	6892
Folk	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Slightly Gravelly Sand	Slightly Gravelly Sand
Sorting	Poorly Sorted	Moderately Sorted	Moderately Sorted	Moderately Sorted	Poorly Sorted	Poorly Sorted	Poorly Sorted	Very Poorly Sorted	Moderately Sorted	Moderately Sorted
Skewness	Coarse Skewed	Symmetrical	Coarse Skewed	Coarse Skewed	Coarse Skewed	Very Coarse Skewed	Coarse Skewed	Very Fine Skewed	Coarse Skewed	Symmetrical
Kurtosis	Leptokurtic	Mesokurtic	Very Leptokurtic	Leptokurtic	Leptokurtic	Very Leptokurtic	Leptokurtic	Very Platykurtic	Platykurtic	Mesokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	11	12	13	14	15	16	17	19	23	24
EMU Lab ID	6893	6894	6895	6896	6897	6898	6899	6901	6905	6906
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16000	0,00	2,96	0,00	0,00	0,00	0,00	0,00	3,51	0,00	0,00
8000	0,00	2,00	0,00	0,27	5,70	0,00	4,06	5,35	0,10	0,00
4000	0,09	2,97	0,17	0,16	2,48	0,11	5,17	2,22	0,14	0,00
2000	0,44	7,09	0,07	0,57	6,17	0,36	10,97	16,61	0,63	0,08
1000	1,81	15,62	0,28	1,99	5,73	2,99	10,61	38,50	1,46	0,37
500	11,07	21,71	1,75	20,65	6,60	10,67	10,57	14,67	5,60	1,64
250	65,88	17,35	35,53	67,63	30,18	39,35	20,41	6,47	72,19	19,62
125	18,61	20,44	52,39	7,22	34,55	42,54	30,82	8,94	17,91	75,00
63	0,63	6,88	6,92	0,42	6,31	2,27	5,44	1,75	0,73	2,06
<63	1,47	2,97	2,89	1,09	2,29	1,71	1,95	1,97	1,23	1,23
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	11	12	13	14	15	16	17	19	23	24
EMU Lab ID	6893	6894	6895	6896	6897	6898	6899	6901	6905	6906
% Gravel	0,5%	15,0%	0,2%	1,0%	14,3%	0,5%	20,2%	27,7%	0,9%	0,1%
%Sand	98,0%	82,0%	96,9%	97,9%	83,4%	97,8%	77,8%	70,3%	97,9%	98,7%
% Silt/Clay	1,5%	3,0%	2,9%	1,1%	2,3%	1,7%	1,9%	2,0%	1,2%	1,2%
Mean (mm)	0,33	0,54	0,22	0,40	0,41	0,27	0,53	1,16	0,32	0,20
Md (mm)	0,34	0,54	0,21	0,38	0,29	0,27	0,37	1,34	0,33	0,19
Mean (phi)	1,62	0,88	2,17	1,30	1,28	1,89	0,92	-0,21	1,64	2,31
Md (phi)	1,56	0,89	2,23	1,39	1,77	1,91	1,42	-0,42	1,58	2,38
Sorting (phi)	0,70	1,92	0,77	0,68	1,89	0,85	1,97	1,79	0,63	0,56
Skq	0,07	-0,08	-0,01	-0,14	-0,44	-0,14	-0,36	0,10	0,10	-0,27
Kurtosis	1,41	1,05	1,00	1,34	1,54	0,94	0,86	1,53	1,39	1,12

Descriptive Statis

Station No.	11	12	13	14	15	16	17	19	23	24
EMU Lab ID	6893	6894	6895	6896	6897	6898	6899	6901	6905	6906
Folk	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand
Sorting	Moderately Well Sorted	Poorly Sorted	Moderately Sorted	Moderately Well Sorted	Poorly Sorted	Moderately Sorted	Poorly Sorted	Poorly Sorted	Moderately Well Sorted	Moderately Well Sorted
Skewness	Symmetrical	Symmetrical	Symmetrical	Coarse Skewed	Very Coarse Skewed	Coarse Skewed	Very Coarse Skewed	Symmetrical	Fine Skewed	Coarse Skewed
Kurtosis	Leptokurtic	Mesokurtic	Mesokurtic	Leptokurtic	Very Leptokurtic	Mesokurtic	Platykurtic	Very Leptokurtic	Leptokurtic	Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	25	26	27	28	29	30	31	32	33	34
EMU Lab ID	6907	6908	6909	6910	6911	6912	6913	6914	6915	6916
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16000	0,00	0,00	14,28	22,55	1,93	0,00	0,00	0,00	0,00	0,00
8000	0,00	0,11	2,84	6,85	1,48	0,28	0,07	0,00	0,00	0,07
4000	0,00	0,42	12,41	1,60	2,03	0,97	0,33	0,03	0,23	0,66
2000	0,27	0,82	22,86	3,82	4,22	1,25	0,80	0,11	0,27	1,07
1000	0,44	0,83	14,66	5,09	4,78	1,26	0,91	0,23	0,36	1,24
500	1,36	4,21	7,02	5,77	4,50	1,65	4,00	1,12	0,83	2,07
250	27,30	70,04	4,31	13,50	12,10	32,64	77,66	45,85	20,77	71,27
125	64,73	21,74	11,47	36,58	56,13	57,25	14,52	50,26	72,34	21,61
63	4,44	0,59	6,46	2,83	10,02	3,19	0,52	1,38	3,48	0,59
<63	1,45	1,25	3,70	1,40	2,81	1,50	1,19	1,00	1,72	1,42
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	25	26	27	28	29	30	31	32	33	34
EMU Lab ID	6907	6908	6909	6910	6911	6912	6913	6914	6915	6916
% Gravel	0,3%	1,3%	52,4%	34,8%	9,7%	2,5%	1,2%	0,1%	0,5%	1,8%
%Sand	98,3%	97,4%	43,9%	63,8%	87,5%	96,0%	97,6%	98,8%	97,8%	96,8%
% Silt/Clay	1,4%	1,3%	3,7%	1,4%	2,8%	1,5%	1,2%	1,0%	1,7%	1,4%
Mean (mm)	0,21	0,31	1,59	1,07	0,27	0,23	0,34	0,24	0,20	0,31
Md (mm)	0,20	0,32	2,15	0,40	0,20	0,22	0,34	0,24	0,19	0,32
Mean (phi)	2,22	1,70	-0,67	-0,10	1,88	2,11	1,57	2,03	2,31	1,71
Md (phi)	2,32	1,62	-1,10	1,32	2,34	2,21	1,57	2,05	2,38	1,63
Sorting (phi)	0,65	0,63	2,75	2,92	1,56	0,71	0,53	0,64	0,58	0,59
Skq	-0,18	0,16	0,19	-0,59	-0,53	-0,25	0,10	-0,04	-0,24	0,25
Kurtosis	0,99	1,25	0,97	0,52	1,92	0,88	1,31	0,74	1,13	1,12

Descriptive Statis

Station No.	25	26	27	28	29	30	31	32	33	34
EMU Lab ID	6907	6908	6909	6910	6911	6912	6913	6914	6915	6916
Folk	Slightly Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Sandy Gravel	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand
Sorting	Moderately Well Sorted	Moderately Well Sorted	Very Poorly Sorted	Very Poorly Sorted	Poorly Sorted	Moderately Sorted	Moderately Well Sorted	Moderately Well Sorted	Moderately Well Sorted	Moderately Well Sorted
Skewness	Coarse Skewed	Fine Skewed	Fine Skewed	Very Coarse Skewed	Very Coarse Skewed	Coarse Skewed	Symmetrical	Symmetrical	Coarse Skewed	Fine Skewed
Kurtosis	Mesokurtic	Leptokurtic	Mesokurtic	Very Platykurtic	Very Leptokurtic	Platykurtic	Leptokurtic	Platykurtic	Leptokurtic	Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	35	36	37	38	39	40	41	42	43	44
EMU Lab ID	6917	6918	6919	6920	6921	6922	6923	6924	6925	6926
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16000	0,00	0,00	0,00	0,00	0,00	2,48	0,00	0,00	0,00	0,00
8000	0,19	0,73	0,33	0,00	0,00	1,50	1,99	0,05	0,00	1,59
4000	0,21	6,77	0,26	0,99	1,17	3,32	0,64	0,21	0,29	0,95
2000	1,03	33,46	0,59	1,34	2,13	6,87	1,95	0,58	1,06	2,84
1000	1,68	24,57	1,03	1,85	2,68	10,25	3,74	0,85	1,83	3,64
500	2,32	11,64	5,51	2,89	4,11	13,49	5,32	5,15	2,84	4,97
250	18,22	4,64	40,21	12,62	20,20	24,92	29,91	58,10	12,11	20,11
125	62,45	6,33	45,46	65,50	56,77	28,66	48,06	30,66	64,10	56,95
63	11,36	7,00	2,46	12,06	10,38	6,32	6,52	2,06	14,89	7,02
<63	2,54	4,86	4,16	2,73	2,55	2,19	1,87	2,35	2,87	1,92
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	35	36	37	38	39	40	41	42	43	44
EMU Lab ID	6917	6918	6919	6920	6921	6922	6923	6924	6925	6926
% Gravel	1,4%	41,0%	1,2%	2,3%	3,3%	14,2%	4,6%	0,8%	1,4%	5,4%
%Sand	96,0%	54,2%	94,7%	94,9%	94,2%	83,6%	93,5%	96,8%	95,8%	92,7%
% Silt/Clay	2,5%	4,9%	4,2%	2,7%	2,5%	2,2%	1,9%	2,4%	2,9%	1,9%
Mean (mm)	0,20	1,01	0,25	0,19	0,22	0,46	0,25	0,28	0,18	0,24
Md (mm)	0,19	1,55	0,24	0,18	0,20	0,36	0,23	0,30	0,18	0,21
Mean (phi)	2,32	-0,01	2,02	2,38	2,20	1,13	2,02	1,84	2,48	2,09
Md (phi)	2,42	-0,63	2,05	2,46	2,35	1,48	2,13	1,74	2,50	2,28
Sorting (phi)	0,80	1,98	0,87	0,85	1,04	1,84	1,11	0,72	0,81	1,16
Skq	-0,15	0,45	-0,02	-0,21	-0,29	-0,32	-0,28	0,13	-0,10	-0,39
Kurtosis	1,52	1,14	1,11	1,90	1,61	1,08	1,42	0,94	1,69	1,64

Descriptive Statis

Station No.	35	36	37	38	39	40	41	42	43	44
EMU Lab ID	6917	6918	6919	6920	6921	6922	6923	6924	6925	6926
Folk	Slightly Gravelly Sand	Sandy Gravel	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand
Sorting	Moderately Sorted	Poorly Sorted	Moderately Sorted	Moderately Sorted	Poorly Sorted	Poorly Sorted	Poorly Sorted	Moderately Sorted	Moderately Sorted	Poorly Sorted
Skewness	Coarse Skewed	Very Fine Skewed	Symmetrical	Coarse Skewed	Coarse Skewed	Very Coarse Skewed	Coarse Skewed	Fine Skewed	Symmetrical	Very Coarse Skewed
Kurtosis	Very Leptokurtic	Leptokurtic	Mesokurtic	Very Leptokurtic	Very Leptokurtic	Mesokurtic	Leptokurtic	Mesokurtic	Very Leptokurtic	Very Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	45	46	47	48	49	51	52	53	54	55
EMU Lab ID	6927	6928	6929	6930	6931	6933	6934	6935	6936	6937
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	20,54	0,00	0,00	28,68	0,00	0,00	0,00	36,59	0,00
16000	0,00	21,60	11,67	0,00	14,35	2,66	0,00	0,00	10,42	0,00
8000	0,44	4,03	4,36	0,00	3,61	0,61	0,00	0,00	8,13	3,77
4000	0,85	1,66	2,14	0,00	3,21	1,56	0,31	0,04	1,92	2,00
2000	4,47	5,01	3,34	0,04	3,52	4,23	0,68	0,31	5,05	10,71
1000	9,84	13,36	8,39	0,34	7,44	5,13	0,61	0,54	11,82	25,71
500	15,05	10,85	19,71	1,53	10,09	8,55	0,80	1,60	14,01	22,42
250	31,24	13,32	37,94	25,97	19,17	40,78	5,44	17,48	9,16	17,34
125	31,46	7,80	11,18	68,67	7,70	31,03	83,68	70,73	1,63	13,62
63	4,41	1,01	0,34	2,25	0,75	2,38	5,04	7,51	0,48	2,92
<63	2,24	0,81	0,94	1,21	1,49	3,07	3,45	1,79	0,79	1,50
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	45	46	47	48	49	51	52	53	54	55
EMU Lab ID	6927	6928	6929	6930	6931	6933	6934	6935	6936	6937
% Gravel	5,8%	52,8%	21,5%	0,0%	53,4%	9,1%	1,0%	0,3%	62,1%	16,5%
%Sand	92,0%	46,3%	77,6%	98,8%	45,1%	87,9%	95,6%	97,9%	37,1%	82,0%
% Silt/Clay	2,2%	0,8%	0,9%	1,2%	1,5%	3,1%	3,4%	1,8%	0,8%	1,5%
Mean (mm)	0,37	3,38	1,02	0,21	3,75	0,35	0,18	0,19	7,09	0,71
Md (mm)	0,33	2,96	0,50	0,20	3,89	0,31	0,18	0,19	12,40	0,79
Mean (phi)	1,45	-1,76	-0,03	2,23	-1,91	1,51	2,50	2,37	-2,83	0,48
Md (phi)	1,62	-1,57	1,01	2,32	-1,96	1,67	2,50	2,42	-3,63	0,35
Sorting (phi)	1,36	2,95	2,33	0,60	3,06	1,39	0,54	0,65	2,73	1,61
Skq	-0,21	-0,04	-0,59	-0,26	0,05	-0,30	0,04	-0,10	0,40	0,05
Kurtosis	1,04	0,61	1,32	0,96	0,55	1,60	1,52	1,41	0,58	0,97

Descriptive Statis

Station No.	45	46	47	48	49	51	52	53	54	55
EMU Lab ID	6927	6928	6929	6930	6931	6933	6934	6935	6936	6937
Folk	Gravelly Sand	Sandy Gravel	Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Gravelly Sand
Sorting	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Moderately Well Sorted	Very Poorly Sorted	Poorly Sorted	Moderately Well Sorted	Moderately Well Sorted	Very Poorly Sorted	Poorly Sorted
Skewness	Coarse Skewed	Symmetrical	Very Coarse Skewed	Coarse Skewed	Symmetrical	Coarse Skewed	Symmetrical	Coarse Skewed	Very Fine Skewed	Symmetrical
Kurtosis	Mesokurtic	Very Platykurtic	Leptokurtic	Mesokurtic	Very Platykurtic	Very Leptokurtic	Very Leptokurtic	Leptokurtic	Very Platykurtic	Mesokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	56	57	58	59	60	61	62	63	64	65
EMU Lab ID	6938	6939	6940	6941	6942	6943	6944	6945	6946	6947
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16000	8,84	0,00	0,00	0,42	0,00	5,05	4,78	0,00	0,00	0,00
8000	5,65	0,30	0,00	1,92	0,37	1,00	0,18	0,94	0,00	0,00
4000	8,17	1,07	0,04	3,35	3,55	3,03	1,53	0,04	0,18	0,64
2000	13,53	2,11	0,33	3,04	26,48	4,51	2,04	0,30	0,14	2,90
1000	16,39	2,11	0,68	2,15	29,80	3,20	3,41	0,50	1,49	6,08
500	8,87	1,41	1,53	6,17	16,93	1,66	10,61	2,92	8,40	10,57
250	9,09	7,37	26,25	47,37	12,78	3,75	51,65	43,31	44,69	50,43
125	23,75	71,23	66,05	33,13	4,92	65,22	24,28	49,65	42,51	27,55
63	1,88	11,49	3,52	0,76	2,01	9,13	0,50	1,10	1,22	0,76
<63	3,84	2,91	1,60	1,68	3,15	3,45	1,02	1,24	1,37	1,08
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	56	57	58	59	60	61	62	63	64	65
EMU Lab ID	6938	6939	6940	6941	6942	6943	6944	6945	6946	6947
% Gravel	36,2%	3,5%	0,4%	8,7%	30,4%	13,6%	8,5%	1,3%	0,3%	3,5%
%Sand	60,0%	93,6%	98,0%	89,6%	66,5%	83,0%	90,4%	97,5%	98,3%	95,4%
% Silt/Clay	3,8%	2,9%	1,6%	1,7%	3,1%	3,5%	1,0%	1,2%	1,4%	1,1%
Mean (mm)	1,10	0,18	0,21	0,31	1,08	0,31	0,37	0,25	0,27	0,34
Md (mm)	1,12	0,18	0,20	0,31	1,27	0,19	0,35	0,24	0,27	0,33
Mean (phi)	-0,13	2,50	2,22	1,70	-0,12	1,71	1,44	2,01	1,90	1,56
Md (phi)	-0,16	2,50	2,32	1,70	-0,34	2,43	1,53	2,04	1,89	1,59
Sorting (phi)	2,53	0,86	0,63	1,22	1,53	1,99	1,39	0,66	0,78	1,02
Skq	-0,04	-0,18	-0,24	-0,25	0,29	-0,66	-0,34	-0,06	-0,08	-0,17
Kurtosis	0,80	2,39	0,94	1,83	0,99	4,19	2,43	0,74	0,92	1,40

Descriptive Statis

Station No.	56	57	58	59	60	61	62	63	64	65
EMU Lab ID	6938	6939	6940	6941	6942	6943	6944	6945	6946	6947
Folk	Sandy Gravel	Slightly Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Sandy Gravel	Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand
Sorting	Very Poorly Sorted	Moderately Sorted	Moderately Well Sorted	Poorly Sorted	Poorly Sorted	Poorly Sorted	Poorly Sorted	Moderately Well Sorted	Moderately Sorted	Poorly Sorted
Skewness	Symmetrical	Coarse Skewed	Coarse Skewed	Coarse Skewed	Fine Skewed	Very Coarse Skewed	Very Coarse Skewed	Symmetrical	Symmetrical	Coarse Skewed
Kurtosis	Platykurtic	Very Leptokurtic	Mesokurtic	Very Leptokurtic	Mesokurtic	Extremely Leptokurtic	Very Leptokurtic	Platykurtic	Mesokurtic	Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	67	68	69	70	71	72	73	74	75	76
EMU Lab ID	6949	6950	6951	6952	6953	6954	6955	6956	6957	6958
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	28,25	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16000	12,28	0,74	0,00	3,12	0,00	0,00	0,00	10,28	0,00	2,39
8000	2,70	2,25	0,14	2,13	0,00	0,98	0,00	5,77	0,00	4,73
4000	7,51	2,43	0,72	2,58	0,23	1,33	0,16	13,51	0,11	14,02
2000	14,11	12,41	1,41	5,40	0,36	2,30	0,69	37,66	0,39	25,45
1000	15,11	25,54	1,48	12,12	0,85	2,42	1,08	21,27	0,96	18,09
500	11,44	29,77	4,60	11,16	1,65	1,70	2,08	6,30	1,57	13,38
250	4,49	16,14	57,16	17,30	15,18	5,81	23,41	1,60	19,73	6,33
125	1,88	8,65	31,72	40,36	71,92	67,13	64,33	1,54	69,57	8,18
63	0,56	0,75	1,05	3,55	7,72	14,30	3,51	0,62	5,68	2,66
<63	1,66	1,33	1,72	2,27	2,08	4,04	4,74	1,45	1,99	4,78
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	67	68	69	70	71	72	73	74	75	76
EMU Lab ID	6949	6950	6951	6952	6953	6954	6955	6956	6957	6958
% Gravel	64,9%	17,8%	2,3%	13,2%	0,6%	4,6%	0,9%	67,2%	0,5%	46,6%
%Sand	33,5%	80,8%	96,0%	84,5%	97,3%	91,4%	94,4%	31,3%	97,5%	48,6%
% Silt/Clay	1,7%	1,3%	1,7%	2,3%	2,1%	4,0%	4,7%	1,5%	2,0%	4,8%
Mean (mm)	5,25	0,84	0,28	0,42	0,19	0,17	0,21	2,95	0,20	1,33
Md (mm)	4,28	0,86	0,30	0,29	0,18	0,17	0,20	2,75	0,19	1,75
Mean (phi)	-2,39	0,25	1,82	1,25	2,40	2,57	2,25	-1,56	2,31	-0,41
Md (phi)	-2,10	0,22	1,73	1,78	2,44	2,53	2,35	-1,46	2,39	-0,81
Sorting (phi)	2,60	1,44	0,76	1,84	0,64	1,01	0,78	1,55	0,66	2,19
Skq	-0,06	0,02	0,04	-0,50	-0,08	-0,15	-0,07	-0,10	-0,15	0,28
Kurtosis	0,65	1,08	1,08	1,02	1,47	2,62	1,40	1,36	1,35	1,15

Descriptive Statis

Station No.	67	68	69	70	71	72	73	74	75	76
EMU Lab ID	6949	6950	6951	6952	6953	6954	6955	6956	6957	6958
Folk	Sandy Gravel	Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Slightly Gravelly Sand	Sandy Gravel
Sorting	Very Poorly Sorted	Poorly Sorted	Moderately Sorted	Poorly Sorted	Moderately Well Sorted	Poorly Sorted	Moderately Sorted	Poorly Sorted	Moderately Well Sorted	Very Poorly Sorted
Skewness	Symmetrical	Symmetrical	Symmetrical	Very Coarse Skewed	Symmetrical	Coarse Skewed	Symmetrical	Symmetrical	Coarse Skewed	Fine Skewed
Kurtosis	Very Platykurtic	Mesokurtic	Mesokurtic	Mesokurtic	Leptokurtic	Very Leptokurtic	Leptokurtic	Leptokurtic	Leptokurtic	Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	77	78	79	80	81	82	83	84	85	86
EMU Lab ID	6959	6960	6961	6962	6963	6964	6965	6966	6967	6968
Aperture (mm)	%	%	%	%	%	%	%	%	%	%
64000	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
32000	0,00	0,00	0,00	0,00	0,00	11,75	0,00	0,00	0,00	0,00
16000	7,99	0,00	0,00	0,00	0,95	16,77	0,00	17,90	3,66	2,69
8000	0,45	5,50	0,27	2,18	0,08	0,92	0,00	1,94	3,89	0,00
4000	0,63	7,45	0,27	1,19	0,67	2,84	0,86	2,67	1,02	0,55
2000	1,41	15,61	0,71	2,98	1,82	10,67	1,57	5,91	1,60	5,83
1000	1,51	23,02	1,01	2,57	1,74	16,16	1,46	14,35	5,50	42,23
500	2,83	17,05	1,27	2,25	4,05	12,90	1,67	16,72	16,53	32,51
250	16,52	12,15	6,11	9,93	53,54	7,42	10,58	28,30	46,31	7,89
125	58,10	8,16	65,30	53,99	32,21	11,37	69,09	10,18	19,39	5,56
63	7,98	6,13	21,06	21,60	2,41	6,31	11,66	1,22	0,86	1,29
<63	2,57	4,91	4,00	3,32	2,52	2,89	3,11	0,81	1,24	1,46
TOTAL %	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Summary Statistic

Station No.	77	78	79	80	81	82	83	84	85	86
EMU Lab ID	6959	6960	6961	6962	6963	6964	6965	6966	6967	6968
% Gravel	10,5%	28,6%	1,3%	6,3%	3,5%	42,9%	2,4%	28,4%	10,2%	9,1%
%Sand	86,9%	66,5%	94,7%	90,3%	93,9%	54,2%	94,5%	70,8%	88,6%	89,5%
% Silt/Clay	2,6%	4,9%	4,0%	3,3%	2,5%	2,9%	3,1%	0,8%	1,2%	1,5%
Mean (mm)	0,23	0,89	0,15	0,18	0,28	1,96	0,18	1,52	0,43	0,96
Md (mm)	0,20	1,05	0,16	0,17	0,30	1,48	0,18	0,74	0,38	1,02
Mean (phi)	2,10	0,17	2,72	2,48	1,85	-0,97	2,49	-0,60	1,23	0,05
Md (phi)	2,32	-0,07	2,62	2,54	1,76	-0,56	2,49	0,43	1,38	-0,03
Sorting (phi)	1,68	2,12	0,74	1,30	0,86	3,19	0,73	2,62	1,55	1,12
Skq	-0,51	0,16	0,10	-0,29	-0,02	-0,13	-0,08	-0,45	-0,38	0,18
Kurtosis	2,91	1,05	1,45	2,38	1,19	0,67	1,80	0,97	1,96	1,30

Descriptive Statis

Station No.	77	78	79	80	81	82	83	84	85	86
EMU Lab ID	6959	6960	6961	6962	6963	6964	6965	6966	6967	6968
Folk	Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Gravelly Sand	Slightly Gravelly Sand	Sandy Gravel	Slightly Gravelly Sand	Gravelly Sand	Gravelly Sand	Gravelly Sand
Sorting	Poorly Sorted	Very Poorly Sorted	Moderately Sorted	Poorly Sorted	Moderately Sorted	Very Poorly Sorted	Moderately Sorted	Very Poorly Sorted	Poorly Sorted	Poorly Sorted
Skewness	Very Coarse Skewed	Fine Skewed	Fine Skewed	Coarse Skewed	Symmetrical	Coarse Skewed	Symmetrical	Very Coarse Skewed	Very Coarse Skewed	Fine Skewed
Kurtosis	Very Leptokurtic	Mesokurtic	Leptokurtic	Very Leptokurtic	Leptokurtic	Platykurtic	Very Leptokurtic	Mesokurtic	Very Leptokurtic	Leptokurtic

Appendix VI
Moray R3 Stevenson, Telford & MacColl sites. Benthic ecology characterisation
Results of the particle size distribution analysis

% Fractional Data

Station No.	87	88
EMU Lab ID	6969	6970
Aperture (mm)	%	%
64000	0,00	0,00
32000	0,00	0,00
16000	0,00	0,00
8000	0,00	0,00
4000	0,00	0,09
2000	0,17	0,44
1000	1,23	0,96
500	9,19	8,12
250	53,58	51,17
125	34,05	36,82
63	0,76	1,18
<63	1,01	1,22
TOTAL %	**100,00**	**100,00**

Summary Statistic

Station No.	87	88
EMU Lab ID	6969	6970
% Gravel	0,2%	0,5%
%Sand	98,8%	98,3%
% Silt/Clay	1,0%	1,2%
Mean (mm)	0,29	0,28
Md (mm)	0,30	0,29
Mean (phi)	1,81	1,85
Md (phi)	1,74	1,79
Sorting (phi)	0,75	0,75
Skq	0,04	0,02
Kurtosis	0,98	0,94

Descriptive Statis

Station No.	87	88
EMU Lab ID	6969	6970
Folk	Slightly Gravelly Sand	Slightly Gravelly Sand
Sorting	Moderately Sorted	Moderately Sorted
Skewness	Symmetrical	Symmetrical
Kurtosis	Mesokurtic	Mesokurtic

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Appendix VII Results of the sediment contaminants analyses

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Appendix VII
Moray R3 Stevenson, Telford & MacColl sites Benthic ecology characterisation
Results of the sediment contaminants analyses

Table 1. Organic Carbon, Metals, total petroluem hydrocarbon (PAH) and polyaromatic hydrocarbons (PAH)

												Cefas Action Level		Canadian	
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	1	2	ISQG	PEL
Organic Carbon (%)	0,12	0,22	0,17	0,2	0,16	0,14	0,39	0,2	0,27	0,27	0,18				
Aluminium (mg/kg)	1130	1300	1100	1190	888	971	1340	1690	1420	1360	957				
Arsenic (mg/kg)	3,3	4,9	3,7	6,9	3,9	3,9	5,3	3	4,3	4	5,1	20	100	7,24	41,6
Barium (mg/kg)	10	16	13	15	11	16	13	18	16	12	13				
Cadmium (mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0,4	5	0,7	4,2
Chromium (mg/kg)	6,1	6,6	6	7,6	5,8	4,8	11,5	11,1	11,7	11	4,5	40	400	52,3	160
Copper (mg/kg)	1,8	2,3	2,1	1,9	1,4	2	2,2	2,9	2,5	2,3	1,8	40	400	18,7	108
Lead (mg/kg)	4,9	4,4	4,1	3,8	2,5	2,3	5,7	4,9	5,8	5,5	3	50	500	30,2	112
Mercury (mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0,3	3	0,13	0,7
Nickel (mg/kg)	1,9	2,4	2	2,2	1,8	1,8	3	3,9	3,2	3,4	2,1	20	200		
Tin (mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				
TPH (mg/kg)	10	<10.0	19	<10.0	<10.0	<10.0	11	14	14	14	12	Below detection limits (see Table 2)			

Table 2. Total Polyaromatic Hydrocarbon Concentrations (ng/g dry weight basis)

PAH Fraction	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C1 Naphthalenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C2 Naphthalenes	<1	<1	<1	<1	<1	<1	<1	1,3	1,1	<1	<1
C3 Naphthalenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C4 Naphthalenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum Naphthalenes	0	0	0	0	0	0	0	1	1	0	0
Phenanthrene / Anthracene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C1 178	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
C2 178	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C3 178	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum 178	0	0	0	0	0	0	0	1	0	0	0
Dibenzthiophene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C1 Dibenzthiophenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C2 Dibenzthiophenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C3 Dibenzthiophenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum Dibenzthiophenes	0	0	0	0	0	0	0	0	0	0	0
Fluoranthene / pyrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C1 202	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C2 202	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C3 202	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum 202	0	0	0	0	0	0	0	1	0	0	0

Table 2. Total Polyaromatic Hydrocarbon Concentrations (ng/g dry weight basis)

PAH Fraction	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
Benzanthracene / chrysene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C1 228	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C2 228	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum 228	0	0	0	0	0	0	0	0	0	0	0
Benzfluoranthenes / benzopyrenes	<1	<1	<1	<1	<1	<1	<1	5	1	1	<1
C1 252	<1	<1	<1	<1	<1	<1	1	2	2	2	<1
C2 252	<1	<1	<1	<1	<1	<1	<1	2	1	<1	<1
Sum 252	0	0	0	0	0	0	1	9	4	3	0
Aranthanthrenes / indenopyrene / benzperylene	<1	<1	<1	<1	<1	<1	<1	3	<1	<1	<1
C1 276	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
C2 276	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1
Sum 276	0	0	0	0	0	0	0	5	0	0	0
Sum of all fractions	0	0	0	0	0	0	1	17	5	3	0
Sum of NPD fraction	0	0	0	0	0	0	0	2	1	0	0

Appendix VIII Results of the seabed image analyses

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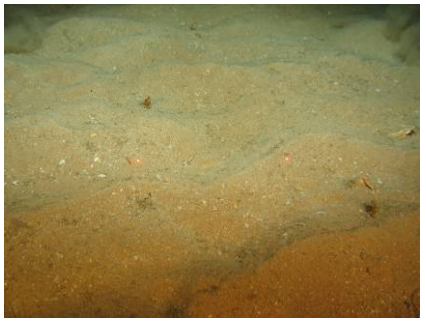
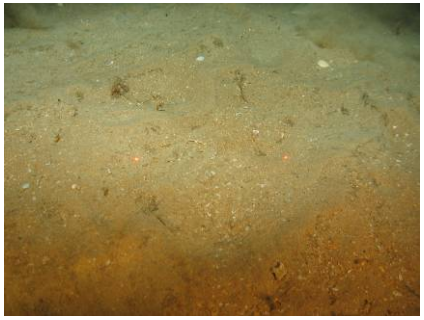
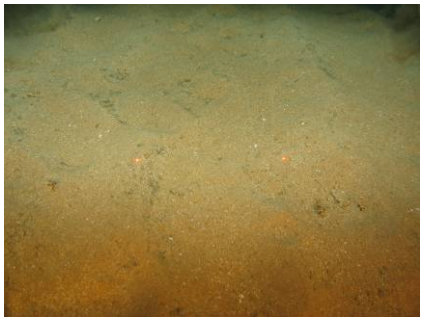
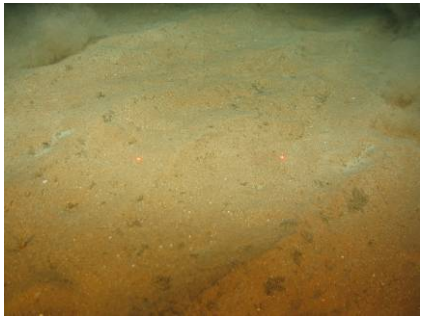
Appendix VIII

Results of the seabed image analysis

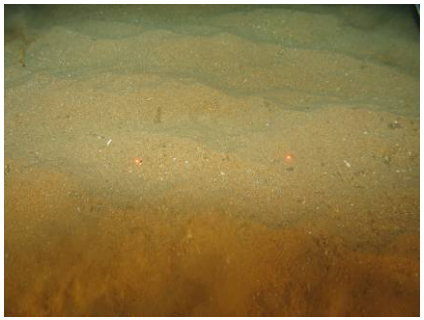
Site	Position of habitat (entire transect unless otherwise stated)	Substrate description	General overall site description	Conspicuous species	Estimated Abundance	Representative Photograph
1		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests	Lanice conchilega Pagurus bernhardus ?Pennatula phosphorea Hydroid turf Pomatoceros sp. Pleuronectiformes Triglidae Chaetopterus variepedatus Bivalve siphons	C-F F R R O P P O O	
2		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests	Pagurus bernhardus Hydroid turf Lanice conchilega Melanogrammus aeglefinus Hydrallmania falcata Terebellidae	O R O P R O	

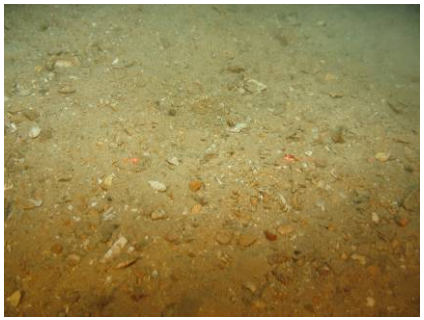
3		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests	Hydroid turf Liocarcinus sp. Melanogrammus aeglefinus Microchirus variegatus Echinus esculentus Hydrallmania falcata Lanice conchilega	R O P P O R O	
4		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests	Melanogrammus aeglefinus Microchirus variegatus ?Buglossidium luteum Lanice conchilega Flustra foliacea Pagurus bernhardus Astropecten irregularis Bivalve siphons Terebellidae	P P P O R O O O O	
5		Rippled sand	Rippled shelly sand with a small patch of gravelly sand. Burrows and Echinocardium cordatum tests.	Hydrallmania falcata Hydroid turf Aequipecten opercularis Lanice conchilega Paguridae Melanogrammus aeglefinus Triglidae	R O O O O P P	

6		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests. Occasional cobbles and low lying small boulders	Hydroid turf Bryozoan crust Pomatoceros sp. Echinus esculentus Lanice conchilega Bivalve siphons Asterias rubens Paguruidae Flustra foliacea Melanogrammus aeglefinus Merlanganius merlangus Pleuronectiformes Triglidae Chaetopterus variepedatus	R-O R O O-F F O O O R P P P P O	
7		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests.	Lanice conchilega Hydroid turf Melanogrammus aeglefinus Bivalve siphons Hydrallmania falcata Bryozoan crusts Flustra foliacea Astropecten irregularis Asterias rubens	F R-O P O R R R O O	
8		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Lanice conchilega Hydroid turf Pagurus bernhardus Flustra foliacea Bivalve siphons Astropecten irregularis Melanogrammus aeglefinus Pleuronectiformis Liocarcinus sp.	F-C R-O O R O O P P O	

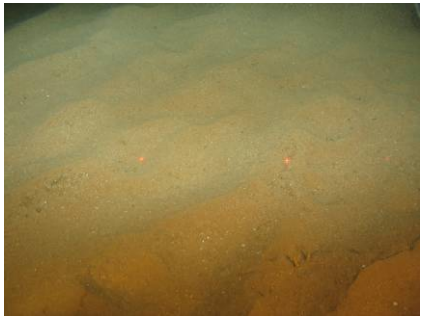
9		Rippled sand	Rippled shelly sand with patches of gravelly sand. Burrows with Echincocardium cordatum tests.	Lanice conchilega Pomatoceros sp. Bryozoan crust Hydroid turf Bivalve siphons Paguridae	F O R R-O O O	
10		Rippled sand	Rippled shelly sand, with gravel, whole shells and pebbles in troughs in places.	Hydroid turf Lanice conchielga Bivalve siphons Echinus esculentus Paguridae Pomatoceros sp. Bryozoan crust	R F-C O F O O R	
11		Rippled sand	Rippled shelly sand with patches of whole shells in troughs. Burrows present.	Hydroid turf Lanice conchilega Liocarcinus sp. Bivalve siphons Asterias rubens Paguridae Chaetopterus variepedatus Nemertesia antennina Terebellidae	R F-A O O O O O R	

12		Rippled sand	Rippled shelly sand with patches of whole shells. Burrows present.	Asterias rubens Lanice conchilega Hydroid turf Bivalve siphons Echinis esculentus Flustra foliacea Pomatoceros sp. Bryozoan crust Pagurus prideaux Adamsia carcinopados Hydrallmania falcata	O F-C R O O-F R O O O O R	
13	Start until 58o14.7148'N, 002o46.6676' W	Rippled sand	Rippled shelly sand.	Hydroid turf Lanice conchilega Pomatoceros sp. Asterias rubens Pagurus bernhardus Nemertesia antennina Bivalve siphons Hydrallmania falcata ?Chaetopterus variepedatus Pecten maximus	R F-A O O O R O R O O	
	58o14.7148'N, 002o46.6676' W until end	Shelly sandy gravel	Shelly sandy gravel with whole shells	Hydroid turf Pagurus bernhardus Pomatoceros sp. Asterias rubens Bryozoan crust Luidia ciliaris Flustra foliacea Pagurus prideaux Adamsia carcinopados	R O O O F O R O O	

14		Rippled sand	Rippled shelly sand	Lanice conchilega Bivalve siphons Pagurus bernhardus	F O O	
15		Rippled sand	Rippled shelly sand. Burrows present and patches of whole shells. A small patch of gravelly shelly sadn was also present.	Bivalve siphons Lanice conchilega Pomatoceros sp. Bryozoan crust Hydroid turf Flustra foliacea Paguridae Pecten maximus Pleuonectiformis	O F O R R R O O P	
16		Rippled sand	Rippled shelly sand	Lanice conchilega Pleuronectes platessa Triglidae Hydroid turf Asterias rubens Chaetopterus variepedatus	F-C P P R O	

17		Rippled sand	Rippled sand with burrows and Echinocardium cordatum tests. Varying proportion of whole shells and gravel along transect. Patches of gravelly sand present, and rarely occurring cobbles and low lying boulders.	Bivalve siphons Lanice conchilega Asterias rubens Hydroid turf Pecten maximus Ophiurida Triglidae Paguridae Pomatoceros sp. Bryozoan crust	O F O R-O O O P O O O	
18		Rippled sand	Rippled shelly sand with cobbles and boulders . Varying proportion of gravel along transect. Patches of cobbles, pebbles and boulders along transect	Melanogrammus aeglefinus Pomatoceros sp. Alcyonium digitatum Flustra foliacea Munida rugosa Nemertesia ramose Echinus esculentus Bryozoan crust Calliostoma zizyphinum Pagurus bernhardus Aequipecten opercularis Halecium halecium Hydroid/bryozoan meadow	P Locally A R O F R F O O O O R R	
19		Shelly gravelly sand	Shelly gravelly sand with pebbles, and occasional cobbles and boulders	Hydroid turf Flustra foliacea Alcyonium digitatum Pomatoceros sp. Bryozoan crust Echinus esculentus Asterias rubens Paguridae Aequipecten opercularis Triglidae Hydrallmania falcata Pagurus prideaux Adamsia carcinopados	R R R F O F O O O P R O O	

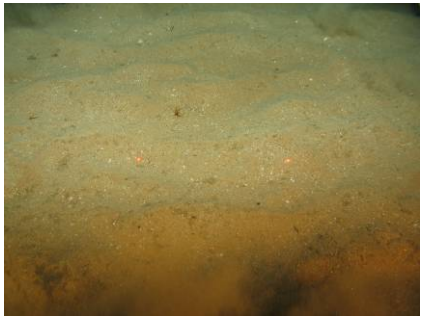
20		Sandy pebbles, gravel, cobbles and rarely occurring boulders.	Sandy pebbles, gravel, cobbles and rarely occurring boulders. Cobbles and boulders are on or embedded within the sandy gravel. One possible bedrock outcrop.	Echnius esculentus Asterias rubens Hydroid turf Pecten maximus Pomatoceros sp. Bryozoan crust Macropodia sp. Metridium senile Porifera crusts	F-C O O O C O-F O R R	
21		Coarse substrate comprised of pebbles, cobbles and boulders.	Coarse substrate comprised of pebbles, cobbles and boulders. Cobbles and boulders are on or embedded within the surrounding substrate, but also on top of other cobbles, creating a matrix with crevices in which *Munida* sp, inhabit.	Echinus esculentus Asterias rubens Hydroid turf Bryozoan crust Pomatoceros sp. Abietinaria abietina Munida rugosa Flustra foliacea Paguridae Corallinaceae Calliostoma zizyphinum	F-A F O C A-S R F R O R O	
22	Start until ~58o12.7368’ N, 002o49.7781’ W	Rippled shelly sand	Rippled shelly sand with pebbles, and cobbles and one boulder.	Pomatoceros sp. Bryozoan crust Hydrallmania falcata Pleuronectiformis Lanice conchilega Calliostoma zizyphinum	F-C O R P F O	

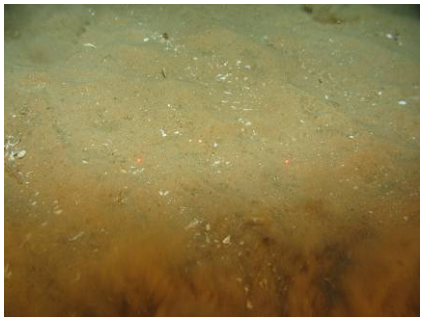
	~58o12.7368' N, 002o49.7781' W		Sandy pebbles and cobbles with small boulders. The proportion of cobbles increased along the transect. Cobbles and boulders are on or embedded within the sandy gravel.	Lanice conchilega Pomatoceros sp. Bryozoan crust Hydroid turf Paguridae Echinus esculentus Alcyonium digitatum Asterias rubens Flustra foliacea Abietinaria abietina	O A O-C O O F-C R O R R	
23	Start until 58o12.5927'N, 002o47.6381' W	Gravelly sand	Gravelly sand with occasional cobbles and boulders	Lanice conchilega Pleuronectiformis Pomatoceros sp. Hydroid turf Bryozoan crust Munida rugosa Aequipecten opercularis	C-A (locally) P F R O O O	VIDEO CAPTURE
	58o12.5927'N, 002o47.6381' W until 58o12.6092'N, 002o47.7196' W	Rippled shelly sand	Rippled shelly sand	Lanice conchilega Asterias rubens Hydroid turf	F O R	

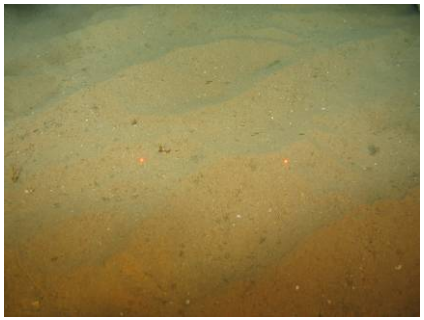
	58o12.6092'N, 002o47.7196' W until	Gravelly sand	Gravelly sand with shells and pebbles	Pomatoceros sp. Munida rugosa Bryozoan crusts Echnius esculentus Triglidae Hydroid turf	C O-C O F P R	
24	Start until 58o11.7767'N, 002o50.5856' W	Rippled sand	Rippled sand, with varying proportion of shell.	Asterias rubens Lanice conchilega Pleuronectiformis Hydroid turf Hydrallmania falcata	O F P R R	
	58o11.7767'N, 002o50.5856' W until end	Sandy shelly gravel	Sandy shelly gravel	Hydroid turf Liocarcinus sp. Paguridae Echinus esculentus Munida rugosa Bryozoan crust Pomatoceros sp. Aequipectent opercularis Luidia sarsi Liocarcinus depurator	R O O F O O O O O O	

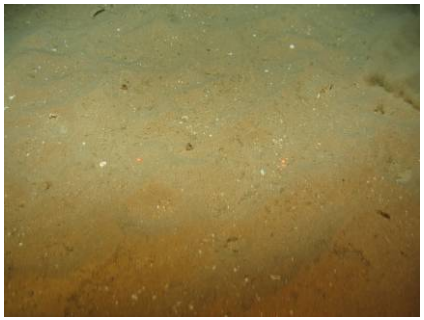
25	Start until 58o11.5660'N, 002o48.5886' W	Gravelly shelly sand	Gravelly shelly sand with dead Ensis sp. shells.	Asterias rubens Echnius esculentus Pomatoceros sp. Bryozoan crust	F F O O	
	58o11.5660'N, 002o48.5886' W until 58o11.5856'N, 002o48.6427' W	Rippled shelly sand	Rippled shelly sand	Lanice conchilega Bivalve siphons	C-F O	
	58o11.5856'N, 002o48.6427' W until end	Gravelly shelly sand	Gravelly shelly sand with dead Ensis sp. shells	Hydroid turf Pomatoceros sp. Bryozoan crust Flustra foliacea Hydrallmania falcata	R O O R R	

26		Rippled shelly sand	Rippled shelly sand with burrows, and Echinocaridium cordatum tests.	Lanice conchilega Hydroid turf Paguridae Asterias rubens Flustra foliacea Bivalve siphons	F R O O R O	
27	Start until 58o11.3396'N, 002o45.0239' W	Shelly sand	Shelly sand with a small patch of rippeld shelly sand at the start of the transect	Nemertesia antennina Hydroid turf Echinus esculentus Pomatoceros sp. Liocarcinus sp. Aequipecten opercularis Paguridae Pecten maximus Bryozoan crust Microchirus variegates Hydroid/bryozoan meadow Pagurus bernhardus Liocarcinus depurator Pagurus prideaux Adamsia carcinopados	R R O O-F O O O O R P R O O O O	
	58o11.3396'N, 002o45.0239' W	Rippled shelly sand	Rippled shelly sand	Flustra foliacea Lanice conchilega Hydroid turf Bivalve siphons	R C-F R O	

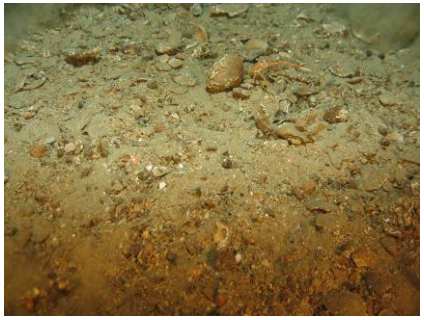
28		Rippled shelly sand	Rippled shelly sand with varying proportions of whole shells and gravel along transect. Occasional pebbles and small cobbles. Small patch of sandy gravel, pebbles and cobbles	Hydroid turf Lanice conchilega Pomatoceros sp. Bryozoan crust Munida rugosa Alcyonium digitatum Asterias rubens Microchirus variegates Hydrallmania falcata Echinus esculentus Flustra foliacea Pecten maximus	R C-F O-F R O R R O P R O R O	
29	Start until 58o11.9933'N, 002o41.4633' W	Shelly gravelly sand	Shelly gravelly sand with occasional pebbles and cobbles.	Nemertesia antennina Hydroid turf Bryozoan crusts Munida rugosa Cottidae Pomatoceros sp. Aequipecten opercularis Liocarconus sp. Lanice conchilega Hydrallmania falcata Paguridae	R R O F P O O O F R O	
	58o11.9933'N, 002o41.4633' W until end	Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests. Small patch of gravelly sand towards the end of the transect.	Lanice conchilega Hydroid turf Flustra foliacea Nemertesia sp. Bivalve siphons Paguridae Liocarcinus sp.	C-F R R R O O O	

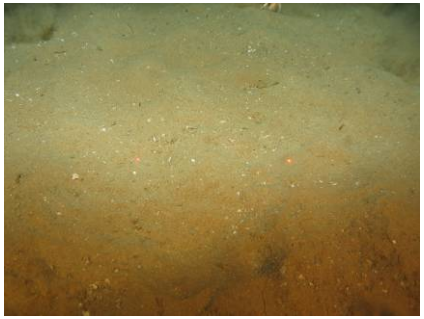
30		Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests.	Microchirus variegates Lanice conchilega Hydroid turf Flustra foliacea Triglidae Nemertesia sp.	P F R R P R	
31		Rippled sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests.	Lanice conchilega Hydroid turf	F R	
32		Rippled sand	Rippled shelly sand with dead Ensis sp. shells. In the middle of the transect, the sand was coarser with whole shells In the troughs.	?Loligo sp. Lanice conchilega Hydroid turf Asterias rubens Hydrallmania falcata Luidia ciliaris Ammodytidae	P F R F R O P	

33	Start until 58o12.5901'N, 002o44.1556' W	Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests.	Bivalve siphons Lanice conchilega Asterias rubens	O F O	
	58o12.5901'N, 002o44.1556' W until 58o12.6100'N, 002o44.1582' W	Shelly sand	Shelly sand with a proportion of whole shells	Aequipecten opercularis Pomatoceros sp. Hydroid turf Bryozoan crust Crossaster papposus Pagurus bernhardus	O F R O O O	
	58o12.6100'N, 002o44.1582' W until end	Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests.	Bivalve siphons Lanice conchilega Asterias rubens Hydroid turf Astropecten irregularis	O F-C O R O	

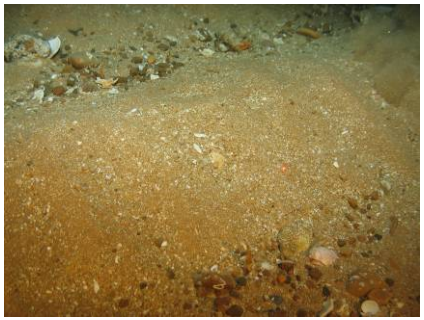
34		Rippled sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests. Small patches of shelly sand with small proportion of gravel.	Lanice conchilega Hydroid turf Pecten maximus Hydrallmania falcata Pagurus bernhardus Pomatoceros sp, Flustra foliacea Asterias rubens Luidia ciliaris Bivalve siphons	F-A R O R O O R O O O	
35		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Paguridae Melanogrammus aeglefinus Lanice conchilega Hydroid turf Bivalve siphons Virgularia mirabilis Liocarcinus sp. Eutrigla gurnhardus Nemertesia ramose	O P F R O O O P R	
36	Start until 58o12.6095'N, 002o37.0207' W	Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Hydroid turf Lanice conchilega Melanogrammus aeglefinus Bivalve siphons Pagurus bernhardus	R F P O o	

	58o12.6095'N, 002o37.0207' W until 58o12.5924'N, 002o37.0651' W	Shelly sand	Shelly sand with whole shells	Pomatoceros sp. Pagurus bernhardus Bryozoan crust Aequipecten opercularis Echinus esculentus Flustra foliacea Hydroid turf	O O R O F R R-O	
	58o12.5924'N, 002o37.0651' W	Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Lanice conchilega Ophiurida Pomatoceros sp. Hydroid turf Aequipecten opercularis Hydrallmania falcata Pagurus bernhardus	F O O R O R O	
37		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Hydroid turf Lanice conchilega Paguridae Hydrallmania falcata Asterias rubens Nemertesia sp. Bivalve siphons Flustra foliacea Aequipecten opercularis Ophiurida	R F O R O R O R R O O	

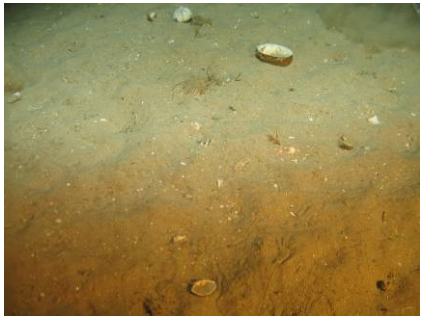
38		Rippled shelly sand	Rippled shelly sand with rarely occurring pebbles and small cobbles	Lanice conchilega Hydroid turf Pomatoceros sp. Asterias rubens Cirripedia Callionymus sp. Atelecyclus rotundatus Liocarcinus sp. Aequipecten opercularis Bryozoan crust	F R O O R P O O O R	
39		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Hydroid turf Lanice conchilega Flustra foliacea Liocarcinus sp, Pagurus bernhardus Asterias rubens Hydrallmania falcata Bivalve siphons Pomatoceros sp. Nemertesia antennina	R F R O O O R O O R	
40		Shelly gravelly sand with patches of pebbles, cobbles and small boulders	Shelly gravelly sand with patches of pebbles, cobbles and small boulders. Varying proportion of gravel and pebbles along the transect.	Echinus esculentus Pomatoceros sp. Bryozoan crust Nemertesia sp. Asterias rubens Hydroid turf Munida rugosa Liocarcinus sp. Pagurus bernhardus Aequipecten opercularis Flustra foliacea Hydroid/bryozoan meadow Nemertesia antennina	F F-C O-C R O R-O C O O O R R R	

41		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Hydrallmania falcata Hydroid turf Lanice conchilega Ammodytidae Ophiurida Bivalve siphons Aequipecten opercularis	R R F P O O O	
42		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Lanice conchilega Hydroid turf Pagurus bernhardus Liocarcinus sp. Hydrallmania falcata Liocarcinus depurator Bivalve siphons	F R O O R O O	
43		Rippled shelly sand	Rippled shelly sand.	Callionymus sp. Lanice conchilega Hydroid turf Pagurus bernhardus Pomatoceros sp. Asterias rubens Flustra foliacea Gastropoda Hydrallmania falcata Bivalve siphons	P C-F R O O O R O R O	

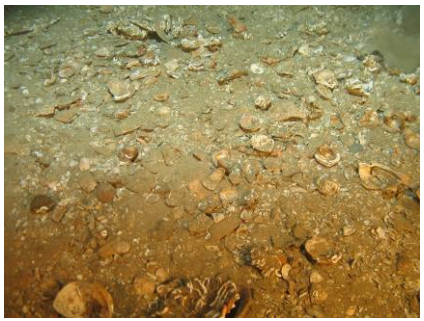
44		Rippled shelly sand	Rippled shelly sand, with rarely occurring pebble and small cobble	Lanice conchilega Hydroid turf Asterias rubens Flustra fioliacea Pomatoceros sp. Nemertesia ramose Aequipecten opercularis Pagurus bernhardus	C-F R O R O R O O	
45		Rippled shelly sand	Rippled shelly sand. Small patches of whole shells. Few burrows and Echinocardium cordatum tests.	Lanice conchilega Callionymus sp. Hydroid turf Chaetopterus variepedatus Liocarcinus sp. Hydrallmania falcata	C-F P R O O R	
46	Start until 58o09.9443'N, 002o45.2134' W	Rippled shelly sand	Rippled shelly sand	Lanice conchilega Hydroid turf Luidia sarsi Asterias rubens Trisopterus luscus	F R O O P	

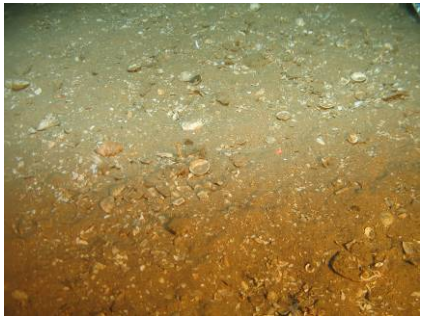
	58o09.9443'N, 002o45.2134' W until end	Gravelly shelly sand with pebbles	Gravelly shelly sand with pebbles, few cobbles and occasional boulders (both low lying and proud of seabed)	Liocarcinus sp. Triglidae Echinus esculentus ?Urticina eques Abietinaria abietina Hydroid / bryozoan meadow Pomatoceros sp. Alcyonium digitatum Bryozoan crust Hydroid turf Paguridae Flustra foliacea Metridium senile Lanice conchilega Asterias rubens Aequipecten opercularis Chaetopterus variepedatus	O P O O R R F-C R O-F O-R O R O F O O O	
47		Rippled gravelly shelly sand	Rippled gravelly shelly sand with pebbles and cobbles, and boulders. Varying proportion of gravel, pebbles, cobbles and boulders along transect.	Aequipecten opercularis Hydroid turf Pomatoceros sp. Bryozoan crust Lanice conchilega Melanogrammus aeglefinus Munida rugosa Asterias rubens Cirripedia Rajidae Ammodytidae Hydroid/bryozoan meadow Calliostoma zizyphinum Chaetopterus variepedatus	O R F-A O-F F P O O R P P R O O	

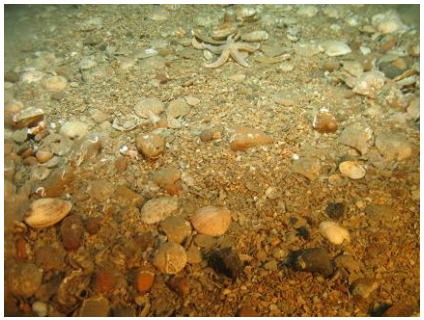
48		Rippled sand	Rippled sand. Small patch at the end of the transect of gravelly shelly sand.	Lanice conchilega Asterias rubens Pomatoceros sp. Pagurus bernhardus	F O O O	
49		Sandy gravel and pebbles with cobbles	Sandy gravel and pebbles with cobbles. Cobbles are on or embedded within the sandy gravel and pebbles.	Echinus esculentus Pomatoceros sp. Alcyonium digitatum Hydroid turf ?Luidia sarsi Bryozoan crust Munida rugosa Sabella sp. Actinaria	F-C C-A R O O O-C F R O	
50		Sandy gravel and pebbles.	Sandy gravel and pebbles, when towards the end of the transect merged into sandy gravel and shells. Presence of cobbles decreases along transect. Cobbles are on or embedded within the sandy gravel and pebbles.	Echnius esculentus Pomatoceros sp. Bryozoan crust Hydroid turf Asterias rubens Munida sp. Melanogrammus aeglefinus Liocarcinus sp. Triglidae Microchirus variegatus Paguridae Flustra foliacea Actinaria Pagurus bernhardus	F-C C-A C-A R O F-O P O P P O R O O	

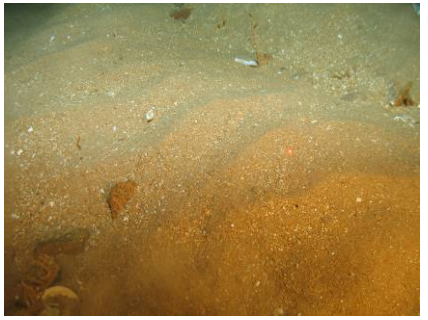
51		Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests	Lanice conchilega Hydroid turf Pagurus bernhardus Pomatoceros sp. Bivalve siphons Paguridae Aequipecten opercularis Pleuronectiformis	F R F R O O O P	
52		Rippled sand	Rippled shelly sand with dead Ensis sp. shells and occasional burrows,and Echinocardium cordatum tests.	Liocarcinus sp. Hydroid turf Lanice conchilega Aequipecten opercularis ?Limanda limanda Triglidae Hydrallmania falcata Chaetopterus variepedatus Eutrigla gurnhardus Bryozoan crust Flustra foliacea Pagurus bernhardus Pecten maximus Alcyonium digitatum ?Tethya citrina Bivalve siphons Abietinaria abietina Cirripedia	O O C O P P R R P R R O O R R P R R	

53		Rippled sand	Rippled shelly sand with dead Ensis sp. shells	Chaetopterus variepedatus Paguridae Liocarcinus sp. Lanice conchilega Hydroid turf Pomatoceros sp.	O O O C-A R O	
54		Sandy pebbles and cobbles with shells	Pebbles and cobbles on shelly sandy gravel. The proportion of sand and coarse substrate varies along the transect. A few large angular boulder with Pomatoceros sp. present.	Liocarcinus sp. Pomatoceros sp. Asterias rubens Nemertesia antennina Corallinaceae Bryozoan crust Hydroid / bryozoan meadow Hydroid turf Alcyonium digitatum Callionymus sp. Aequipecten opercularis Cancer pagurus Galathea sp. Lanice conchilega Caridea Gobiesocidae	O C O C O F R O R P O O P O P R	
55		Gravelly sand with cobbles.	Gravelly sand with cobbles and isolated boulders with patches of ripped sand with a few pebbles, cobbles and large boulders. The proportion of sand, gravel and pebbles varied significantly along the length of the transect.	Flustra foliacea Aequipecten opercularis Agonus cataphractus Nemertesia antennina Pagurus prideaux Adamsia carcinopados Pecten maximus Liocarcinus depurator Munida rugosa Callionymus sp. Pomatoceros sp. Bryozoan crust Hydroid turf	R O P R O O O O F P C O R	

56		Gravelly sand	Rippled gravelly sand with pebbles, cobbles and shells. Along the transect were patches where the proportion of pebbles and shell increased. A couple of angular boulders were present.	Munida rugosa Pomatoceros sp. Bryozoan crust Asterias rubens Echinus esculentus Lanice conchilega Liocarcinus sp. Caridea Hydroid turf Flustra foliacea Liocarcinus depurator Corallinaceae Sabella sp. Halecium sp.	O Locally C Locally F O F O P O R O Locally O O R	 
57		Shelly sand	Shelly sand with shells and pebbles, and a small proportion of gravel and small cobbles in places.	Microchirus variegates Pomatoceros sp. Inachus sp. Trispoterus luscus Lanice conchilega Triglidae Echinus esculentus Liocarcinus sp. Flustra foliacea Asterias rubens Cancer pagurus Cerianthus lloydii Bryozoan crust Hydroid / bryozoan meadow Hydroid turf	P F O P O P O O R O F R R R O	

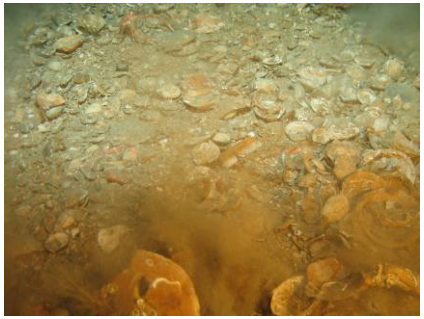
58		Rippled sand	Rippled sand with burrows, and patches of whole shells	Hydroid turf Lanice conchilega Liocarcinus sp. Aequipecten opercularis Bivalve siphons	R C-F O O O	
59		Shelly sand	Shelly sand, with varying proportion of whole and broken shells along transect.	Atelecyclus rotundatus Asterias rubens Inachus sp, Hydroid turf Pagurus bernhardus Liocarcinus sp. Chaeopterus variepedatus Pomatoceros sp. Bryozoan crust Nemertesia sp. Alcyonium digitatum Aequipecten opercularis Liocarcinus depurator Crossaster papposus Lanice conchilega Bivalve siphons Nemertesia antennina ?Cerianthus llyodii	O R O R O O O F O O R F O R O O R O	

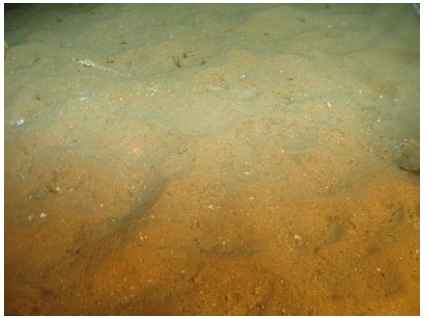
60		Rippled shelly sand	Rippled shelly sand with two boulders and dead Ensis sp. shells. A small proportion of gravel, pebbles and small cobbles.	Hydroid turf Pomatoceros sp. Bryozoan crust Aequipecten opercularis Agonus cataphractus Asterias rubens Munida rugosa Liocarcinus sp. Lanice conchilega Chaetopterus variepedatus Hydrallmania falcata Gobiesocidae Nemertesia ramosa Alcyonium digitatum	R O-F O F P O O O O R R R R R	
61		Rippled sand	Rippled shelly sand	Microchirus variegatus Munida rugosa Merlangius merlangus Pagurus bernhardus Melanogrammus aeglefinus Hydrallmania falcata Lanice conchilega Hydroid turf Liocarcinus sp. Alcyonium digitatum Flustra foliacea Cancer pagurus Aequipecten opercularis Bivalve siphons Cerianthus lloydii Pomatoceros sp. Ammodytidae Halecium sp. Eutrigla gurnhardus Hydroid / bryozoan meadow	P O P O P R O O O R R F F P O O P R P R	

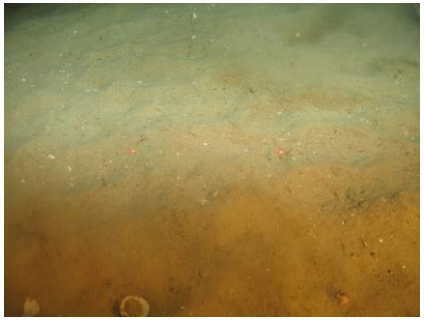
62		Rippled sand	Rippled shelly sand with dead Enssis sp. shells, rarely occurring low lying small cobbles covered with sand and rarely occurring small boulders.	Bivalve siphons Liocarcinus sp. Lanice conchilega Asterias rubens Pleuronectiformis Hydroid turf Pagurus bernhardus Chaetopterus variepedatus Alcyonium digitatum Pomatoceros sp. Bryozoan crusts Astropecten irregularis	P O F – C F P O O O R F R O	
63		Rippled sand	Rippled shelly sand with rarely occurring pebbles and dead Ensis sp. shells	Pagurus bernhardus Pomatoceros sp. Asterias rubens Bivalve siphons Lanice conchilega Ophiurida	O O O P F O	
64		Rippled sand	Rippled shelly sand with dead Ensis sp.shells. Patches of gravel and pebbles within troughs. Slightly more gravelly towards the end of the transect.	Lanice conchilega Bivalve siphons Asterias rubens Hydroid turf Liocarcinus sp. Alcyonium digitatum Pleuronectiformis Bryozoan crust Liocarcinus depurator Chaetopterus variepedatus Ammodytidae Pomatoceros sp.	F-C P F R O R P R O O P O	

65		Rippled sand	Rippled shelly sand with dead Ensis sp. shells. Varying proportion of shell and gravel along transect. Rarely occurring small cobbles.	Lanice conchilega Bivalve siphons Asterias rubens Liocarcinus sp. Pomatoceros sp. Bryozoan crust Ammodytidae Pagurus bernhardus Microchirus variegates	F O O O O R P O P	
66	Start until 58o08.6252'N, 002o49.8557' W	Gravelly sand with pebbles and small and medium cobbles	Rippled gravelly sand with pebbles and small cobbles.	Pomatoceros sp. Bryozoan crust Asterias rubens Alcyonium digitatum Pagurus bernhardus Cirripedia Hydroid turf	C O-C O-F R O O R	
	58o08.6252'N, 002o49.8557' W until end	Gravel, pebbles and small cobbles	Slightly sandy gravel and pebbles and small cobbles with rarely occurring small boulder. Cobbles are on or embedded within the sandy gravel and pebbles.	Pomatoceros sp. Bryozoan crust Asterias rubens Alcyonium digitatum Pagurus bernhardus Cirripedia Hydroid turf Munida rugosa Crossaster papposus Echinus esculentus Flustra foliacea Pleuronectiformis Porifera crust	C-A O-F O O O O O O-F O F R P R	

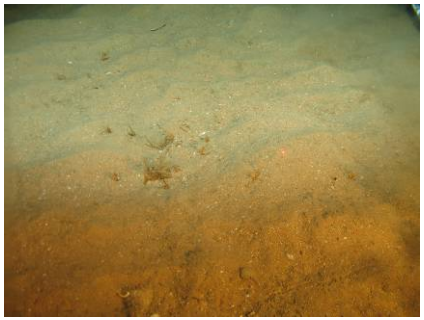
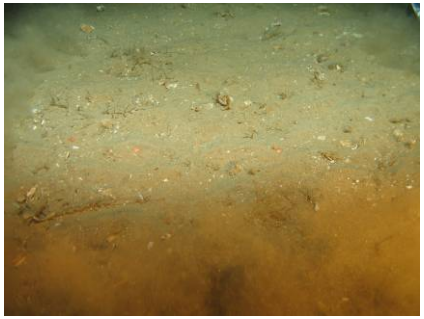
67		Sandy gravel with pebbles and cobbles.	Sandy gravel with pebbles and cobbles. The proportion of sand, gravel, pebbles and cobbles varied significantly along the length of the transect. Cobbles are on or embedded within the sandy gravel and pebbles.	Flustra foliacea Asterias rubens Echinus esculentus Aequipecten opercularis Calliostoma zizyphinum Lanice conchilega Munida rugosa Paguridae Hydroid turf ?Henricia sp. Halecium sp. Hydrallmania falcate Liocarcinus sp. Pomatoceros sp. Bryzoan crust Cirripedia	R O F O O F F-O O R O R R O C-A O-A O	
68		Shelly sand	Shelly sand with dead Ensis sp. shells and a varying proportion of gravel along transect.	Asterias rubens Pomatoceros sp. Liocarcinus depurator Bryozoan crust Aequipecten opercularis Bivalve siphons Hydrallmania falcata Lanice conchilega Chaetopterus variepedatus Cirripedia Pagurus prideaux Adamsia carcinopados Echinus esculentus Flustra foliacea Hydroid turf Alcyonium digitatum Galathea sp.	O C - F O R O O R O O R O O O R R R O	
69	Start until 58o07.3638'N, 002o45.5861' W	Shelly sand	Shelly sand with whole shells and occasional pebbles.	Liocarcinus sp. Agonus cataphractus Lanice conchilega Hydroid turf	O P F R	Video capture

	58o07.3638'N, 002o45.5861' W until 58o07.3529'N, 002o45.5841' W	Rippled sand	Rippled shelly sand	Lanice conchilega	C-F	
	58o07.3529'N, 002o45.5841' W until 58o07.3388'N, 002o45.5816' W	Shelly sand	Shelly sand with whole shells and a low lying boulder	Hydroid turf Alcyonium digitatum Munida rugosa Liocarcinus sp. Pomatoceros sp. Bryozoan crust Pagurus bernhardus Nemertesia sp.	R R O O O R O R	
69	58o07.3388'N, 002o45.5816' W until end	Rippled sand	Rippled sand with burrows, and dead Ensis sp. shells.	Lanice conchilega	C-F	

70		Rippled sand	Rippled shelly sand with occasional pebbles. Varying proportion of gravel and whole shells along transect.	Lanice conchilega Hydroid turf Pomatoceros sp. Asterias rubens Pagurus bernhardus Bryozoan crust Pecten maximus Echinus esculentus Liocarcinus sp. Pagurus bernhardus Callionymus sp. ?Halecium halecium Bivalve siphons	C-F R C-F O O O-R O O O O P R O	
71	Start until 58o07.5608'N, 002o42.5353' W	Rippled sand	Rippled shelly sand	Chaetopterus variepedatus Lanice conchilega Hydroid turf Flustra foliacea Asterias rubens Pagurus bernhardus Hydractinia echinata Callionymus sp. Liocarcinus sp. Pomatoceros sp.	O C-F R R O O O P O O	
	58o07.5608'N, 002o42.5353' W until end	Shelly sand	Rippled shelly sand with whole shells in the troughs	Pomatoceros sp. Bryozoan crust Alcyonium digitatum Hydroid turf Flustra foliacea	C O R R R	VIDEO CAPTURE

72		Rippled sand	Rippled shelly sand	Hydroid turf Liocarcinus sp. Asterias rubens Alcyonium digitatum Porifera Crossaster papposus Nemertesia sp. Aequipecten opercularis Pagurus bernhardus Pomatoceros sp. Bryozoan crust Caridea Microchirus variegates Melanogrammus aeglefinus Lanice conchilega	O O O R R O R O O C R P P P O	
73		Rippled sand	Rippled shelly sand	Lanice conchilega Hydroid turf Alcyonidium diaphanum Liocarcinus sp. Virgularia mirabilis Melanogrammus aeglefinus Asterias rubens Alcyonium digitatum Pennatula phosphorea Caridea Hydrallmania falcata Bivalve siphons Pomatoceros sp.	F R R O C-A P O R O P R P O	
74	All of transect except for the area shown below.	Rippled sand	Rippled shelly sand with burrows	Melanogrammus aeglefinus Lanice conchilega Callionymus sp. Pleuronectiformis Nemertesia antennina Flustra foliacea Hydroid turf Eutigla gurnhardus Paguridae Pomatoceros sp. Bryozoan crust Hydroid / bryozoan meadow	P O P P R R R P O O R R	

	58o07.0310'N, 002o39.7956' W until 58o07.014'N, 002o39.7742' W	Rippled shelly sand	Rippled shelly sand with whole shells within the troughs	Munida rugosa Cancer pagurus Lanice conchilega Pecten maximus Pomatoceros sp. Bryozoan crust Hydroid / bryozoan crust Hydroid turf Alcyonium digitatum Agonus cataphractus Nemertesia antennina Flustra foliacea Ebalia sp.	O F O O F R R O R P R R O	
75		Rippled shelly sand	Rippled shelly sand with burrows, and Echinocardium cordatum tests.	Pomatoceros sp. Lanice conchilega Hydroid turf Flustra foliacea Callionymus sp. Alcyonium digitatum Asterias rubens Pagurus bernhardus Bivalve siphons Nemertesia sp.	O F-C R R P R O O O R	
76	Start until 58o09.4205'N, 002o40.7235' W	Gravelly shelly sand	Gravelly shelly sand with pebbles and low lying cobbles.	Pomatoceros sp. Bryozoan crust Hydroid turf Flustra foliacea Triglidae Echinus esculentus Chaetopterus variepedatus Lanice conchilega	O-C O-F O-R R P O-F O O	

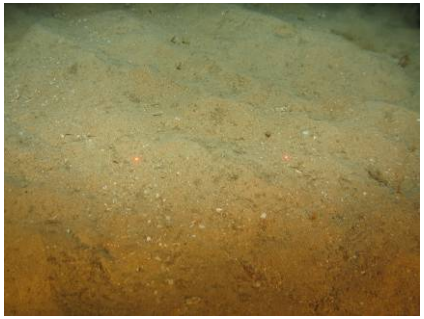
	58o09.4205'N, 002o40.7235' W	Rippled shelly sand	Rippeld shelly sadn with rarely occurring pebbles and cobbles.	Lanice conchilega Pomatoceros sp. Hydroid turf	F-C O O-R	
77		Rippled shelly sand	Rippled shelly sand with burrows. Varying small proportion of gravel, shells and pebbles along transect.	Pomatoceros sp. Hydroid turf Lanice conchilega Hydrallmania falcata Aequipecten opercularis Nemertesia antennina Callionymus sp. Alcyonium digitatum Bryozoan crust Nemertesia ramose	O-F R F-C R O R P R R R	
78		Rippled shelly sand	Rippled shelly sand with varying proportion of shell and gravel along transect. Dead Ensis sp. shells, and burrows, and rarely occurring low lying small cobbles.	Paguridae Liocarcinus sp. Microchirus variegatus Pomatoceros sp. Hydroid turf Lanice conchilega Actinaria Hydrallmania falcata Ophiurida Caridea Bryozoan crust Chaetopterus variepedatus Liocarcinus depurator Melanogrammus aeglefinus	O O P O R C-F R R O O O O O P	

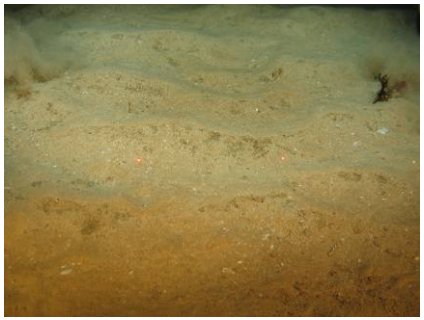
79		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests, and rarely occurring pebbles and cobbles	Liocarcinus depurator Lanice conchilega Hydroid turf Microchirus variegatus Eutrigla gurnhardus Melanogrammus aeglefinus Pecten maximus Flusta foliacea Liocarcinus sp. Pennatula phosphorea Alcyonium digitatum Paguridae Halecium halecium Pomatoceros sp.	O F R P P P O R O R R O R O	
80		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests, and rarely occurring pebbles and cobbles	Liocarcinus sp. Hydroid turf Pennatula phosphorea Lanice conchilega Pomatoceros sp. Melanogrammus aeglefinus Liocarcinus depurator Paguridae Bryozoan crusts Alcyonium digitatum Nemertesia antennina Chaetopterus variepedatus	O O-R O-F F-C O P O O R R R R	
81		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests	Flustra foliacea Lanice conchilega Hydroid turf Liocarcinus sp. Melanogrammus aeglefinus Pomatoceros sp. Aequipecten opercularis Nemertesia antennina	R F R O P O O R	

82		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests. Rarely occurring small low lying cobble. Varying, small proportion of gravel, pebbles and shell along transect	Lanice conchilega Hydroid turf Microchirus variegatus Aequipecten opercularis Hydrallmania falcata Pomatoceros sp. Bryozoan crust Asterias rubens	F-C O-R P O R O R O	
83		Rippled shelly sand	Rippled shelly sand with burrows and Echinocardium cordatum tests. Varying proportion of shell along transect. Whole shells found in patches	Pomatoceros sp. Lanice conchielga Pleuronectiformis Bryozoan crust Hydroid turf Melanogrammus aeglefinus Paguridae Eutrigla gurnhardus Hydrallmania falcata Nemertesia ramosa Pagurus bernhardus Triglidae Liocarcinus depurator Alcyonium digitatum Macropodia sp. Microchirus variegatus Agonus cataphractus	O F P R O-R P O P R R O P O R O P P	

84		Rippled shelly sand	Shelly sand with cobbles and boulders. Varying proportion of gravel along transect.	Echinus esculentus Pomatoceros sp. Bryozoan crust Flustra foliacea Lanice conchilega Asterias rubens Alcyonium digitatum Hydroid / bryozoan meadow Munida rugosa Paguruidae Pleuronectiformis Pagurus bernhardus Hydroid turf Hydrallmania falcata Pleuronectes plastessa Chaetopterus variepedatus Abietinaria abietina Bivalve siphons	C C O-F O F O R O F O P O R R P O R O	
85		Rippled shelly sand	Rippled shelly sand with occasional cobbles and small boulders	Lanice conchilega Triglidae ?Merlangius merlangus Pomatoceros sp. Bryozoan crust Flustra foliacea Melanogrammus aeglefinus Echinus esculentus Hydroid turf Trisopterus luscus ?Limanda limanda	F P P F-O O O-R P F R P P	

86		Rippled shelly sand	Rippled shelly sand	Paguridae Flustra foliacea Trisopterus luscus Lanice conchilega Aequipecten opercularis Pagurus bernhardus Hydroid/bryozaon meadow Hydroid turf	F-C R P O O F-C R R	
87		Rippled shelly sand	Rippled shelly sand with dead Ensis sp. shells	Lanice conchilega Paguridae Plueronectes platessa Ammodytidae Astropecten irregularis Asterias rubens Pagurus bernhardus	F O P P O O O	
88		Rippled shelly sand	Rippled shelly sand with dead Ensis sp. shells and rarely occurring small cobbles and boulders. Varying proportion of shell along transect	Pomatoceros sp. Hydroid turf Echinus esculentus Lanice conchilega Bivalve siphons Asterias rubens Pagurus bernhardus Alcyonium digitatum Chaetopterus variepedatus Liocarcinus sp. Astropecten irregularis	Locally F R o C-F O O O R O O O	

VT1		Shelly sand	Shelly sand with occasional gravel, pebbles and cobbles. Varying proportion of gravel, and shell along transect.	Nemertesia antennina Hydroid turf Ophiurida Paguridae Hydrallmania falcata Echinus esculentus Pomatoceros sp. Aequipecten opercularis Alcyonium digitatum Pecten maximus Munida rugosa Flustra foliiacea Chaetopterus variepedatus	R R F O R F O-F O R O F –C R O	
VT2		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests	Hydroid turf Lanice conchilega Paguridae Melanogrammus aeglefinus Triglidae Astropecten irregularis Asterias rubens Gastropoda Limanda limanda Actinaria Hydrallmania falcata Microchirus variegatus Bivalve siphons Necklace shell egg capsules	R O O P P O O O P O R P O P	
V01		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests. With one very large boulder	Lanice conchilega Melanogrammus aeglefinus Limanda limanda Hydroid turf Microchirus variegatus On boulder: Metridium senile Alcyonium digitatum Echinus esculentus Bryozoan crust Pomatoceros sp. Munida rugosa	O P P R P Locally A C A A A-S F	

V02		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests. One small boulder	Paguridae Hyroid turf Astropecten irregulairs Microchirus varigatus Triglidae	O R O P P	
V03		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests. Rarely occurring small cobble	Triglidae Lanice conchilega Pomatoceros sp. Microchirus variegatus Hydroid turf	P O O P R	
V04		Rippled sand	Rippled shelly sand with burrows and Echinocardium cordatum tests.	Lanice conchilega Asterias rubens Microchirus variegatus Paguridae Triglidae Hydroid turf Echinus esculentus Melanogrammus aeglefinus Limanda limanda	O O P O P R O P P	

DV8		Rippled shelly sand	Rippled shelly sand with dead Ensis sp. shells and occasional pebbles and cobbles	Lanice conchilega Bivalve siphons Liocarcinus sp. Hydroid turf Pomatoceros sp. Bryozoan crust	F-C O O R O R	

Appendix IX Grab sample species list

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Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
ZM0001	RHODOPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0194	Corallinaceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-
ZM0443	Plocamium cartilagineum	-	-	-	-	P	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0556	Ptilota gunneri	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0628	Brongniartella byssoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0655	Polysiphonia	-	-	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
ZR0313	Dictyota dichotoma	-	-	-	P	P	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0001	CHLOROPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0149	Enteromorpha	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0195	Cladophora	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
	BRYOPHYTA	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (eggs)	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-
A0001	PROTOZOA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Astrorhiza	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lagotia viridis	P	P	P	P	-	-	P	P	P	P	P	P	P	P	-	P	P	-	-	P	P	P	P	P	P	P	P	P	P	P
C0001	PORIFERA	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C0133	Scypha ciliata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C0475	Cliona	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	P	-	P	-	-
D0216	FILIFERA	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
D0218	Eudendrium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0246	Bougainvilliidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0261	Dicoryne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-
D0336	Lovenella clausa	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-
D0351	Campanulina pumila	-	P	-	P	-	-	P	P	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	-	P	P	-	-	-
D0382	Filellum serpens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0386	Lafoea dumosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
D0390	Halecium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	P	-	-	-	-	-	P	-	-	-
D0413	Diphasia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0424	Hydrallmania falcata	-	-	-	-	-	-	P	P	-	-	-	P	-	-	P	-	-	-	-	P	-	-	-	-	-	P	P	-	P	-
D0427	Sertularella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-
D0433	Sertularia	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	P	-	P	-	P	-	-
D0452	Halopteris catharina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0455	Kirchenpaueria pinnata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
D0462	Nemertesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0469	Plumularia setacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
D0491	Campanulariidae	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	P	-	-	P	P	P	P	-	-	-
D0494	Campanularia hincksii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0499	Rhizocaulus verticillatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0503	Clytia hemisphaerica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0597	Alcyonium digitatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	-
D0632	Cerianthus lloydii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0662	ACTINIARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0759	Edwardsiidae	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
D0766	Edwardsia claparedii	1	-	1	1	-	-	-	1	-	3	-	1	3	-	1	-	-	-	-	-	-	1	-	1	1	-	-	-	-	P
F0002	TURBELLARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
G0001	NEMERTEA	3	2	1	2	-	-	3	2	1	-	1	4	1	P	1	-	1	6	3	4	2	1	-	-	1	4	3	3	-	1
HD0001	NEMATODA	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	-	1	-	-	-	-	-	24	-	-	-	-
K0015	Loxosomella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K0045	Pedicellina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sagittidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N0014	Golfingia elongata	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N0017	Golfingia vulgaris	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N0020	Nephasoma (?)	-	-	-	-	2	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-
N0025	Nephasoma minutum	-	-	-	-	1	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-	2	-	-	-	-	6	-	-	-	-
N0034	Phascolion strombus	-	-	1	-	-	-	-	4	-	-	-	3	-	-	1	-	-	-	-	1	-	-	-	-	-	-	4	-	-	-
P0008	Paleanotus debilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0015	Pisione remota	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
P0019	Aphrodita aculeata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0027	Acanthicolepis asperrima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subadyte (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0034	Alentia gelatinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0049	Gattyana cirrhosa	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-
P0058	Harmothoe extenuata	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-
P0059	Harmothoe fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0065	Harmothoe impar (agg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	-	-	-	-	4	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
ZM0001	RHODOPHYTA	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0194	Corallinaceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-
ZM0443	Plocamium cartilagineum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-
ZM0556	Ptilota gunneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0628	Brongniartella byssoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0655	Polysiphonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZR0313	Dictyota dichotoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P
ZS0001	CHLOROPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0149	Enteromorpha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-
ZS0195	Cladophora	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BRYOPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (eggs)	-	-	-	P	-	P	-	-	-	P	-	P	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-	-
A0001	PROTOZOA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
	Astrorhiza	-	-	-	1	-	1	-	-	-	-	5	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
	Lagotia viridis	-	P	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	-	P	P	P	-	-	P	P	-	P
C0001	PORIFERA	-	-	-	-	P	-	-	-	P	-	-	-	-	-	P	P	-	-	-	P	-	-	-	-	-	-	-	P	P	-
C0133	Scypha ciliata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-
C0475	Cliona	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	P	-	P	P	-	-	-	P	-	-	-	-	-	-	P
D0216	FILIFERA	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0218	Eudendrium	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-
D0246	Bougainvilliidae	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0261	Dicoryne	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0336	Lovenella clausa	-	-	P	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-
D0351	Campanulina pumila	-	-	-	-	P	-	P	-	-	P	-	P	-	P	-	-	-	P	-	-	-	-	-	-	-	P	-	P	-	-
D0382	Filellum serpens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0386	Lafoea dumosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0390	Halecium	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	P	-	P	P	-	-	-	P	P	-	-	-	-	-	-
D0413	Diphasia	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0424	Hydrallmania falcata	-	-	-	-	P	-	P	-	-	-	-	P	-	P	-	-	-	-	P	P	-	-	-	-	-	P	-	P	-	-
D0427	Sertularella	-	-	-	-	-	-	P	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P
D0433	Sertularia	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	P	-	-	-	P	-	-	-	-	-	-	-
D0452	Halopteris catharina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0455	Kirchenpaueria pinnata	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-
D0462	Nemertesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0469	Plumularia setacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0491	Campanulariidae	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	P	P	-	-	P	P	P	-	-	-	-	P	P
D0494	Campanularia hincksii	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0499	Rhizocaulus verticillatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
D0503	Clytia hemisphaerica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	P	-	-	-	-	P	-	-
D0597	Alcyonium digitatum	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	P	-	-	-	-	P	-	-
D0632	Cerianthus lloydii	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
D0662	ACTINIARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0759	Edwardsiidae	-	-	2	1	-	-	-	-	-	-	P	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
D0766	Edwardsia claparedii	2	-	-	1	-	-	2	1	-	-	-	1	-	1	1	-	3	-	-	3	1	3	-	-	-	3	-	5	2	1
F0002	TURBELLARIA	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
G0001	NEMERTEA	-	-	-	-	9	P	-	5	3	1	3	1	P	7	1	1	-	2	5	1	3	2	6	2	P	5	3	5	9	5
HD0001	NEMATODA	-	-	-	-	47	-	-	-	-	-	-	-	-	3	-	-	-	-	1	-	-	-	6	-	-	-	-	-	68	-
K0015	Loxosomella	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K0045	Pedicellina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	P	-	-	P	-	P	-	-
	Sagittidae	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N0014	Golfingia elongata	-	-	2	-	2	-	-	-	4	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	8	-	-	1	-
N0017	Golfingia vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
N0020	Nephasoma (?)	-	-	1	-	18	-	-	-	14	-	-	-	1	1	3	1	-	-	3	-	-	-	2	-	-	32	-	3	23	2
N0025	Nephasoma minutum	-	-	-	-	30	-	-	-	7	-	-	-	-	2	2	7	-	3	-	-	-	-	9	2	-	34	-	7	15	-
N0034	Phascolion strombus	-	-	1	-	-	-	-	-	5	1	-	1	3	4	2	1	-	2	-	-	-	-	7	3	-	-	-	-	-	-
P0008	Paleanotus debilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	15	-
P0015	Pisione remota	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
P0019	Aphrodita aculeata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0027	Acanthicolepis asperrima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subadyte (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-
P0034	Alentia gelatinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0049	Gattyana cirrhosa	-	-	-	-	-	-	2	-	-	-	-	-	-	4	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-
P0058	Harmothoe extenuata	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	3	-
P0059	Harmothoe fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0065	Harmothoe impar (agg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	8	5	-	-	-	4	-	-	-	-	-	3	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
ZM0001	RHODOPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
ZM0194	Corallinaceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0443	Plocamium cartilagineum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-
ZM0556	Ptilota gunneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0628	Brongniartella byssoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZM0655	Polysiphonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZR0313	Dictyota dichotoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0001	CHLOROPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0149	Enteromorpha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZS0195	Cladophora	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
	BRYOPHYTA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (?)	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANIMALIA (eggs)	-	-	P	P	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	P	-
A0001	PROTOZOA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Astrorhiza	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	4	-	6	6	-	-	1	-	-	-	-	-
	Lagotia viridis	-	P	P	P	P	-	P	P	-	P	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-	P	P
C0001	PORIFERA	-	-	-	-	-	-	-	-	-	-	P	P	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-
C0133	Scypha ciliata	-	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C0475	Cliona	-	-	-	-	-	-	P	-	-	-	P	-	P	-	P	-	-	-	-	-	P	-	P	-	P	-	-
D0216	FILIFERA	-	-	-	-	-	-	-	P	-	P	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-
D0218	Eudendrium	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0246	Bougainvilliidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0261	Dicoryne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0336	Lovenella clausa	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
D0351	Campanulina pumila	P	-	-	-	-	P	-	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-
D0382	Filellum serpens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-
D0386	Lafoea dumosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0390	Halecium	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0413	Diphasia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0424	Hydrallmania falcata	-	-	-	-	P	-	-	-	-	-	-	-	-	P	P	-	P	-	-	-	P	-	-	-	-	P	-
D0427	Sertularella	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
D0433	Sertularia	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-
D0452	Halopteris catharina	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0455	Kirchenpaueria pinnata	-	-	-	-	-	P	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0462	Nemertesia	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0469	Plumularia setacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0491	Campanulariidae	-	-	-	-	P	P	-	-	P	-	-	-	-	P	-	-	P	-	-	-	P	-	-	-	-	-	-
D0494	Campanularia hincksii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0499	Rhizocaulus verticillatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0503	Clytia hemisphaerica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D0597	Alcyonium digitatum	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
D0632	Cerianthus lloydii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	-	-
D0662	ACTINIARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
D0759	Edwardsiidae	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
D0766	Edwardsia claparedii	-	-	-	-	3	-	-	3	-	2	4	1	-	1	-	3	-	-	1	5	-	2	-	-	8	1	1
F0002	TURBELLARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
G0001	NEMERTEA	2	2	4	-	9	11	14	1	2	2	2	4	1	P	20	5	16	4	2	2	11	2	1	-	6	3	-
HD0001	NEMATODA	-	-	-	-	2	23	51	-	8	-	-	-	31	-	7	-	19	-	-	-	7	-	-	-	9	-	-
K0015	Loxosomella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K0045	Pedicellina	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sagittidae	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N0014	Golfingia elongata	-	-	-	-	-	18	1	-	-	-	-	-	-	-	19	-	4	-	-	-	10	-	-	-	-	-	-
N0017	Golfingia vulgaris	-	-	-	-	-	9	-	-	-	-	-	-	2	-	1	-	-	-	-	-	2	-	-	-	-	-	-
N0020	Nephasoma (?)	-	-	-	-	-	30	11	-	-	-	-	-	-	-	63	1	31	-	-	-	32	1	-	-	1	-	-
N0025	Nephasoma minutum	-	-	-	-	3	48	2	-	28	-	1	-	-	-	29	-	56	-	-	-	69	-	-	-	-	-	-
N0034	Phascolion strombus	2	-	-	-	2	10	-	-	5	2	-	-	-	P	20	1	15	-	2	-	10	-	-	1	1	-	1
P0008	Paleanotus debilis	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0015	Pisione remota	-	-	-	-	-	11	18	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	43	-	-
P0019	Aphrodita aculeata (juv)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0027	Acanthicolepis asperrima	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subadyte (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0034	Alentia gelatinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0049	Gattyana cirrhosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0058	Harmothoe extenuata	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0059	Harmothoe fragilis	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0065	Harmothoe impar (agg)	-	-	-	-	1	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
P0051	Malmgreniella andreapolis	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0055	Malmgreniella castanea	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0066	Malmgreniella ljungmani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	4	-	1	-	-
P0067	Malmgreniella arenicolae	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0070	Malmgreniella mcintoshi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	12	-	-	-	-
P0082	Lepidonotus squamatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-
P0092	Pholoe baltica (sensu petersen)	2	1	-	1	1	1	-	-	-	-	-	2	-	-	3	-	1	P	2	-	-	-	-	-	-	15	2	1	-	-
P0094	Pholoe inornata (sensu petersen)	-	-	-	-	1	-	-	-	-	-	-	P	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-
P0104	Sigalion mathildae	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0109	Sthenelais limicola	-	1	-	1	1	1	-	-	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P	2
P0118	Eteone longa (agg)	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-	1	-	-
P0122	Hesionura elongata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0124	Hypereteone foliosa	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0136	Pseudomystides limbata	1	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
P0141	Anaitides groenlandica	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0146	Anaitides rosea	-	-	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0151	Eulalia aurea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0152	Eulalia bilineata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
P0155	Eulalia mustela	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	4	1	-	-	-	-	-	-	-	-	-	-	-
P0161	Eulalia viridis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
P0164	Eumida bahusiensis	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
P0165	Eumida ockelmanni (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0167	Eumida sanguinea	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-
P0169	Nereiphylla lutea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0174	Notophyllum foliosum	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0176	Paranaitis kosteriensis	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0256	Glycera alba	1	-	1	-	1	-	1	-	-	-	-	1	-	-	1	-	2	-	-	-	-	-	1	-	-	-	2	-	-	-
P0259	Glycera fallax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	P	-	-	-	-
P0260	Glycera lapidum (agg)	2	-	1	-	2	3	-	5	-	1	-	11	-	-	9	-	3	-	4	-	5	-	-	-	1	2	3	2	-	-
P0262	Glycera oxycephala	-	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
P0268	Glycinde nordmanni	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0271	Goniada maculata	1	-	1	-	5	-	1	-	-	-	1	-	-	-	1	1	1	-	-	-	-	1	-	-	-	-	1	1	-	-
P0276	Goniadella gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0282	Ephesiella peripatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0291	Sphaerodorum gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0297	Gyptis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0305	Psamathe fusca	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-	-	-	-
P0311	Nereimyra punctata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	6	-	-	-	-	-	1	-	-	-	-
P0319	Podarkeopsis capensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0346	Syllidae (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0355	Eurysyllis tuberculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0358	Syllis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	Syllis "species D"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0365	Syllis armillaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-
P0349	Syllis cornuta (agg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Syllis parapari	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	6	-	-	-	-
P0371	Syllis variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0362	Trypanosyllis coeliaca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-
P0380	Eusyllis blomstrandi	-	-	-	3	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
P0387	Odontosyllis fulgurans	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	-	-	-	-
P0388	Odontosyllis gibba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0421	Exogone hebes	-	-	1	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
P0421	Exogone hebes (epitoke)	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0422	Exogone naidina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0423	Exogone verugera	1	-	-	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0423	Exogone verugera (epitoke)	-	-	2	1	-	1	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	4	-	1	-
P0425	Sphaerosyllis bulbosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0427	Sphaerosyllis hystrix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0430	Sphaerosyllis taylori	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0430	Sphaerosyllis taylori (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0434	Autolytus	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0458	Nereididae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eunereis (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0475	Eunereis longissima	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
P0478	Nereis zonata	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0493	Aglaophamus rubella	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
P0051	Malmgreniella andreapolis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0055	Malmgreniella castanea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0066	Malmgreniella ljungmani	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-	-	-	1	-	-	2	-	2	21	-
P0067	Malmgreniella arenicolae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-
P0070	Malmgreniella mcintoshi	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	6	-
P0082	Lepidonotus squamatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
P0092	Pholoe baltica (sensu petersen)	-	-	-	-	12	-	2	1	2	-	-	1	-	3	2	-	-	1	1	3	1	-	2	1	-	-	1	1	2	-
P0094	Pholoe inornata (sensu petersen)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
P0104	Sigalion mathildae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
P0109	Sthenelais limicola	-	P	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-
P0118	Eteone longa (agg)	-	-	-	-	2	-	-	1	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2	1
P0122	Hesionura elongata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0124	Hypereteone foliosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0136	Pseudomystides limbata	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
P0141	Anaitides groenlandica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0146	Anaitides rosea	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
P0151	Eulalia aurea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	1	-	-	-	-	-	-	-
P0152	Eulalia bilineata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	-	-	-	1	-	-	-	-	-	-	-
P0155	Eulalia mustela	-	-	-	-	2	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
P0161	Eulalia viridis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	-	-
P0164	Eumida bahusiensis	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	1	-	-	1	-	-	-
P0165	Eumida ockelmanni (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0167	Eumida sanguinea	-	-	-	-	6	-	-	-	1	-	-	-	-	-	-	-	-	1	2	-	-	-	1	-	-	9	-	1	2	1
P0169	Nereiphylla lutea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
P0174	Notophyllum foliosum	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0176	Paranaitis kosteriensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0256	Glycera alba	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	1
P0259	Glycera fallax	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
P0260	Glycera lapidum (agg)	-	-	-	-	5	-	-	-	2	-	-	-	-	8	3	3	-	-	4	1	-	-	2	1	3	1	1	2	13	1
P0262	Glycera oxycephala	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	P	-	-	-	-	1	1	-	-
P0268	Glycinde nordmanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0271	Goniada maculata	-	-	-	-	-	-	-	1	1	-	-	-	2	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-
P0276	Goniadella gracilis	-	-	-	-	3	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
P0282	Ephesiella peripatus	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
P0291	Sphaerodorum gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0297	Gyptis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
P0305	Psamathe fusca	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	5	-
P0311	Nereimyra punctata	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	23	10	-	-	-	1	-	-	7	-	1	2	-
P0319	Podarkeopsis capensis	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
P0346	Syllidae (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0355	Eurysyllis tuberculata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0358	Syllis	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	-
	Syllis "species D"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
P0365	Syllis armillaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	6	1	-	-	-	-	-	-	4	-	-	2	-
P0349	Syllis cornuta (agg)	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Syllis parapari	-	-	-	-	1	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	-	-	3	-	-	-	-	-	10	-
P0371	Syllis variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0362	Trypanosyllis coeliaca	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	13	-
P0380	Eusyllis blomstrandi	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0387	Odontosyllis fulgurans	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0388	Odontosyllis gibba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0421	Exogone hebes	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0421	Exogone hebes (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0422	Exogone naidina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0423	Exogone verugera	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0423	Exogone verugera (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0425	Sphaerosyllis bulbosa	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	32	-
P0427	Sphaerosyllis hystrix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
P0430	Sphaerosyllis taylori	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	1	-
P0430	Sphaerosyllis taylori (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0434	Autolytus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0458	Nereididae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eunereis (Type A)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
P0475	Eunereis longissima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0478	Nereis zonata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
P0493	Aglaophamus rubella	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
P0051	Malmgreniella andreapolis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0055	Malmgreniella castanea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P0066	Malmgreniella ljungmani	-	-	-	-	1	7	6	-	-	-	-	-	10	-	1	-	-	-	-	-	-	-	-	-	1	-	-
P0067	Malmgreniella arenicolae	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-
P0070	Malmgreniella mcintoshi	-	-	-	-	-	19	-	-	1	-	-	-	8	-	1	-	3	-	-	-	2	-	-	-	-	-	-
P0082	Lepidonotus squamatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0092	Pholoe baltica (sensu petersen)	-	-	-	-	3	2	-	2	-	-	-	3	2	-	15	2	17	-	-	4	4	-	-	-	-	-	-
P0094	Pholoe inornata (sensu petersen)	-	-	-	-	1	1	1	-	1	2	1	-	1	-	7	-	1	-	1	-	1	-	-	-	-	-	-
P0104	Sigalion mathildae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0109	Sthenelais limicola	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	1	-	1	-	1	1
P0118	Eteone longa (agg)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	-	-	-	2	-	1	-	1	-	-
P0122	Hesionura elongata	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0124	Hypereteone foliosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0136	Pseudomystides limbata	-	-	-	-	-	18	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0141	Anaitides groenlandica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0146	Anaitides rosea	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0151	Eulalia aurea	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0152	Eulalia bilineata	-	-	-	-	-	4	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
P0155	Eulalia mustela	1	-	-	-	-	6	2	-	3	-	-	-	2	-	8	-	1	-	-	-	2	-	1	-	4	-	-
P0161	Eulalia viridis	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P0164	Eumida bahusiensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-
P0165	Eumida ockelmanni (?)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0167	Eumida sanguinea	-	-	-	-	3	-	3	-	1	-	1	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
P0169	Nereiphylla lutea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P0174	Notophyllum foliosum	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0176	Paranaitis kosteriensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0256	Glycera alba	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
P0259	Glycera fallax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-
P0260	Glycera lapidum (agg)	1	-	1	-	5	7	13	-	2	-	-	-	19	-	7	-	10	-	-	-	10	1	2	-	9	-	-
P0262	Glycera oxycephala	4	-	-	-	-	-	-	3	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0268	Glycinde nordmanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0271	Goniada maculata	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	-	-	1	-	-	-	-	-
P0276	Goniadella gracilis	-	-	-	1	-	-	7	-	-	-	-	-	2	-	2	-	-	-	-	-	2	-	-	1	1	-	-
P0282	Ephesiella peripatus	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	1	-	-	-	-	-	-	-	-	-	-
P0291	Sphaerodorum gracilis	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0297	Gyptis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0305	Psamathe fusca	-	-	-	-	-	1	4	-	1	-	-	-	5	-	-	-	-	-	-	-	1	-	-	-	4	-	-
P0311	Nereimyra punctata	-	1	-	-	12	22	-	-	3	-	-	-	-	-	5	-	3	-	-	-	-	-	-	-	-	-	-
P0319	Podarkeopsis capensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0346	Syllidae (epitoke)	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0355	Eurysyllis tuberculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0358	Syllis	-	-	-	-	1	2	9	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4	-	-
	Syllis "species D"	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0365	Syllis armillaris	-	-	-	-	5	-	-	-	1	-	-	-	-	-	5	-	4	-	-	-	-	-	-	-	-	-	-
P0349	Syllis cornuta (agg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
	Syllis parapari	-	-	-	-	-	21	4	-	11	-	-	-	-	-	21	-	22	-	2	-	6	-	-	-	2	-	-
P0371	Syllis variegata	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0362	Trypanosyllis coeliaca	-	-	-	-	-	2	1	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0380	Eusyllis blomstrandi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0387	Odontosyllis fulgurans	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0388	Odontosyllis gibba	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0421	Exogone hebes	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0421	Exogone hebes (epitoke)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0422	Exogone naidina	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-
P0423	Exogone verugera	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
P0423	Exogone verugera (epitoke)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0425	Sphaerosyllis bulbosa	-	-	-	-	-	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0427	Sphaerosyllis hystrix	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0430	Sphaerosyllis taylori	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0430	Sphaerosyllis taylori (epitoke)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0434	Autolytus	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0458	Nereididae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eunereis (Type A)	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
P0475	Eunereis longissima	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	-	-	1	1	-	-	-	-	-	-
P0478	Nereis zonata	-	-	-	-	1	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
P0493	Aglaophamus rubella	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
P0494	Nephtys (juv)	1	2	3	-	3	3	-	-	1	2	-	-	1	2	1	-	1	-	-	-	-	-	1	-	-	-	2	5	3	-
P0495	Nephtys assimilis	1	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0496	Nephtys caeca	2	-	-	3	-	-	-	-	-	-	-	2	1	-	-	1	1	-	-	-	2	-	-	-	-	-	-	-	-	1
P0498	Nephtys cirrosa	-	-	2	2	-	1	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	1	2	1	-	-	-	1	2	-
P0499	Nephtys hombergii	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
P0502	Nephtys kersivalensis	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0503	Nephtys longosetosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0505	Nephtys pente	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0537	Onuphidae (juv)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0539	Aponuphis bilineata	-	-	-	-	2	1	-	3	1	-	1	1	-	2	3	-	1	1	-	-	2	-	-	-	-	1	3	3	1	-
P0542	Hyalinoecia tubicola	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
P0545	Nothria conchylega (Type A)	-	-	-	-	-	-	-	1	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
P0563	Marphysa (juv)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0564	Marphysa bellii	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0572	Lumbrineris (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0579	Lumbrineris gracilis	3	1	P	-	-	1	-	-	-	-	-	3	-	-	1	1	11	3	-	P	2	-	-	-	1	10	4	7	1	-
	Scoletoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
P0597	Notocirrus scoticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0613	Ophryotrocha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-
P0633	Parougia caeca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0638	Protodorvillea kefersteini	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0642	Schistomeringos neglecta	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
P0661	Orbinia (juv)	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
P0665	Orbinia sertulata	-	-	-	-	-	-	-	-	2	-	-	-	-	2	1	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1
P0672	Scoloplos armiger	1	1	2	1	1	1	1	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	1	-	-	-	3	1	-	1
P0684	Aricidea catherinae	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	-	-
P0685	Aricidea cerrutii	6	3	5	-	3	1	1	2	2	1	-	4	1	1	2	-	2	1	1	-	-	1	1	-	-	2	1	1	1	1
P0686	Aricidea laubieri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0688	Aricidea simonae	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
P0693	Levinsenia gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0695	Paradoneis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0699	Paradoneis lyra	-	-	2	-	2	1	-	-	-	-	-	-	-	-	-	-	1	2	-	-	3	-	-	-	-	3	3	2	-	-
P0718	Poecilochaetus serpens	4	5	2	1	2	1	-	-	-	-	1	3	3	3	2	1	3	1	-	-	-	1	5	-	-	-	5	2	2	1
P0723	Aonides paucibranchiata	1	1	-	1	-	-	-	2	-	-	2	17	-	-	4	-	1	8	2	-	-	1	-	-	1	10	-	1	1	-
P0733	Laonice bahusiensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-
P0739	Malacoceros vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0743	Microspio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0745	Minuspio (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0747	Minuspio cirrifera	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-
P0750	Polydora caeca (agg)	-	-	1	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	100	10	1	-	-	-	3	2	2	-	-
P0751	Polydora caulleryi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	-	-	-	-	1	-	-	-	-
P0766	Prionospio banyulensis	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	1	-	-	-	-	2	-	-	-	-
P0774	Pseudopolydora pulchra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P0777	Scolelepis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0779	Scolelepis bonnieri	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0780	Scolelepis cantabra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni (Type A, ?)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0788	Spio armata (agg)	-	-	-	-	-	-	-	1	-	-	-	4	-	-	-	1	-	4	-	-	6	-	-	-	-	2	-	-	-	-
P0789	Spio decorata	-	1	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0790	Spio filicornis	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
P0790	Spio filicornis (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0793	Spiophanes (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
P0794	Spiophanes bombyx	52	39	55	26	46	32	57	26	11	19	9	2	7	6	12	11	42	-	-	-	-	13	10	20	2	-	32	26	15	9
P0796	Spiophanes kroyeri	-	1	1	-	1	-	1	-	-	-	-	2	-	-	2	-	3	1	-	-	-	-	-	-	-	-	1	-	-	-
P0804	Magelona alleni	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-
P0805	Magelona filiformis	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0811	Chaetopterus	-	-	-	-	P	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
	Aphelochaeta "species A"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
	Caulleriella "species B"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0829	Caulleriella alata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chaetozone christiei	-	-	3	2	-	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	2	3	2
P0834	Chaetozone setosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0831	Chaetozone zetlandica	1	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	1	1	-	-	1	-	-	-	-	2	-	-	-	-
P0835	Cirratulus (juv)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
P0494	Nephtys (juv)	1	-	-	-	-	-	1	6	-	3	2	-	1	5	-	-	-	1	1	1	-	-	-	1	-	1	2	-	-	-
P0495	Nephtys assimilis	-	-	-	1	-	1	-	1	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
P0496	Nephtys caeca	-	-	-	-	-	-	-	-	2	-	-	-	2	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0498	Nephtys cirrosa	1	1	1	-	-	-	-	-	-	-	-	2	3	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-
P0499	Nephtys hombergii	-	1	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0502	Nephtys kersivalensis	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
P0503	Nephtys longosetosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
P0505	Nephtys pente	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0537	Onuphidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P0539	Aponuphis bilineata	1	-	1	-	-	-	-	2	-	1	-	-	-	5	2	-	-	5	2	-	-	2	-	1	1	2	5	4	-	-
P0542	Hyalinoecia tubicola	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0545	Nothria conchylega (Type A)	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
P0563	Marphysa (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0564	Marphysa bellii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0572	Lumbrineris (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
P0579	Lumbrineris gracilis	-	-	8	4	12	2	4	9	11	-	13	9	-	3	5	-	-	6	6	11	2	8	1	3	14	26	1	24	2	13
	Scoletoma	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0597	Notocirrus scoticus	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	1
P0613	Ophryotrocha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0633	Parougia caeca	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0638	Protodorvillea kefersteini	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
P0642	Schistomeringos neglecta	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
P0661	Orbinia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0665	Orbinia sertulata	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-
P0672	Scoloplos armiger	P	-	1	-	-	-	-	-	3	-	-	-	1	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-
P0684	Aricidea catherinae	-	-	-	-	-	-	2	-	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P0685	Aricidea cerrutii	1	1	-	-	5	-	1	1	2	1	-	-	3	2	2	-	-	-	-	-	-	-	8	2	-	-	1	1	10	-
P0686	Aricidea laubieri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0688	Aricidea simonae	-	-	1	2	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
P0693	Levinsenia gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P0695	Paradoneis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0699	Paradoneis lyra	-	-	1	-	1	-	1	2	3	-	1	-	-	3	-	1	-	3	-	3	-	-	2	-	-	-	-	3	3	1
P0718	Poecilochaetus serpens	1	-	-	-	1	-	4	10	P	5	4	1	4	6	-	-	-	-	-	4	-	1	-	-	4	1	2	1	-	-
P0723	Aonides paucibranchiata	-	-	-	-	10	-	1	1	1	-	1	-	1	6	4	-	1	-	-	-	-	-	5	-	-	-	-	-	5	-
P0733	Laonice bahusiensis	-	-	-	-	4	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	-	-	-	-
P0739	Malacoceros vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P0743	Microspio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	1
P0745	Minuspio (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0747	Minuspio cirrifera	-	-	-	-	1	1	1	-	1	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
P0750	Polydora caeca (agg)	-	-	1	-	2	-	1	1	-	-	1	-	2	1	-	3	-	94	65	-	4	1	7	1	2	48	2	14	-	1
P0751	Polydora caulleryi	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	2	-	1	4	-	4	-	-
P0766	Prionospio banyulensis	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-
P0774	Pseudopolydora pulchra	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0777	Scolelepis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0779	Scolelepis bonnieri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0780	Scolelepis cantabra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	Scolelepis korsuni (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
	Scolelepis korsuni (Type A, ?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0788	Spio armata (agg)	1	-	-	-	-	-	-	-	2	-	-	-	-	1	-	2	-	-	2	-	-	-	6	1	-	-	-	-	-	-
P0789	Spio decorata	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0790	Spio filicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0790	Spio filicornis (Type A)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0793	Spiophanes (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0794	Spiophanes bombyx	5	6	19	8	-	12	46	20	-	3	10	25	9	3	-	-	4	-	-	15	4	4	-	-	3	1	7	6	-	1
P0796	Spiophanes kroyeri	-	-	-	2	-	1	2	2	-	1	1	1	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	3	-	-
P0804	Magelona alleni	-	-	2	3	-	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	1	-	3
P0805	Magelona filiformis	-	1	-	3	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	1	-	-
P0811	Chaetopterus	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	Aphelochaeta "species A"	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caulleriella "species B"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0829	Caulleriella alata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
	Chaetozone christiei	1	3	-	-	-	2	1	2	-	-	-	2	-	-	-	-	2	-	-	1	2	2	-	-	1	1	-	2	-	-
P0834	Chaetozone setosa	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0831	Chaetozone zetlandica	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	1	-	3	-	-
P0835	Cirratulus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
P0494	Nephtys (juv)	1	2	-	3	-	-	-	6	1	1	3	3	-	1	-	-	-	-	1	-	-	-	-	1	-	2	3
P0495	Nephtys assimilis	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0496	Nephtys caeca	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
P0498	Nephtys cirrosa	-	3	2	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1
P0499	Nephtys hombergii	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-
P0502	Nephtys kersivalensis	-	-	-	-	-	-	-	-	1	-	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
P0503	Nephtys longosetosa	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0505	Nephtys pente	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0537	Onuphidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0539	Aponuphis bilineata	7	1	2	1	6	-	1	1	5	-	-	-	-	-	-	-	1	-	-	-	-	3	1	-	-	-	-
P0542	Hyalinoecia tubicola	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
P0545	Nothria conchylega (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0563	Marphysa (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0564	Marphysa bellii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
P0572	Lumbrineris (Type A)	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0579	Lumbrineris gracilis	-	2	-	-	26	-	-	5	4	7	27	8	2	4	15	14	18	2	9	4	6	10	-	-	-	-	-
	Scoletoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0597	Notocirrus scoticus	-	-	-	-	-	-	-	-	-	-	P	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0613	Ophryotrocha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0633	Paarougia caeca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0638	Protodorvillea kefersteini	-	-	-	-	-	2	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-
P0642	Schistomeringos neglecta	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-
P0661	Orbinia (juv)	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0665	Orbinia sertulata	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
P0672	Scoloplos armiger	2	1	-	-	2	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0684	Aricidea catherinae	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0685	Aricidea cerrutii	1	-	2	-	2	-	2	1	-	-	-	-	-	-	4	-	2	-	-	-	-	-	-	-	5	1	2
P0686	Aricidea laubieri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P0688	Aricidea simonae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
P0693	Levinsenia gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0695	Paradoneis	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0699	Paradoneis lyra	-	-	-	-	5	2	-	-	-	1	-	-	-	-	3	4	-	1	-	-	-	-	-	-	-	-	-
P0718	Poecilochaetus serpens	1	5	1	2	-	-	-	4	1	19	-	-	1	5	2	-	2	-	1	-	1	1	-	-	1	3	2
P0723	Aonides paucibranchiata	2	-	-	-	3	8	8	2	4	1	-	-	6	1	3	-	3	-	-	1	-	-	1	-	20	-	1
P0733	Laonice bahusiensis	-	-	-	-	-	2	1	-	-	-	-	-	2	-	-	-	5	-	-	-	2	-	-	-	-	-	-
P0739	Malacoceros vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0743	Microspio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0745	Minuspio (?)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0747	Minuspio cirrifera	-	-	-	-	2	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0750	Polydora caeca (agg)	1	-	-	-	55	27	-	-	13	-	-	-	-	-	10	-	5	-	-	-	1	1	-	-	-	-	-
P0751	Polydora caulleryi	-	-	-	-	-	6	-	-	2	-	-	-	-	-	4	-	1	-	-	-	1	-	-	-	-	-	-
P0766	Prionospio banyulensis	-	-	-	-	-	4	-	1	1	-	-	-	-	-	1	-	4	-	-	-	-	-	-	-	-	-	-
P0774	Pseudopolydora pulchra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0777	Scolelepis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
P0779	Scolelepis bonnieri	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-
P0780	Scolelepis cantabra	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scolelepis korsuni (Type A, ?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0788	Spio armata (agg)	-	-	-	-	2	1	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	5	-	-	-	2
P0789	Spio decorata	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-
P0790	Spio filicornis	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P0790	Spio filicornis (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0793	Spiophanes (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0794	Spiophanes bombyx	7	13	5	9	1	-	-	5	-	5	-	-	-	6	-	-	-	1	-	3	-	1	-	1	1	12	6
P0796	Spiophanes kroyeri	-	-	-	-	1	-	-	1	2	-	1	1	-	2	1	1	-	1	2	-	-	4	1	-	-	-	-
P0804	Magelona alleni	-	-	-	-	-	-	-	-	-	-	7	7	1	1	-	1	-	-	-	3	-	3	-	-	-	-	-
P0805	Magelona filiformis	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	4	-	1	-	-	-	-	-	-	-
P0811	Chaetopterus	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
	Aphelochaeta "species A"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
	Caulleriella "species B"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
P0829	Caulleriella alata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chaetozone christiei	2	-	2	3	-	-	-	-	-	5	1	1	-	-	-	-	-	1	-	1	-	1	-	-	-	-	2
P0834	Chaetozone setosa	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0831	Chaetozone zetlandica	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-
P0835	Cirratulus (juv)	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
	Cirratulus incertus	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0840	Dodecaceria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
P0840	Dodecaceria (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0846	Tharyx killariensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
P0878	Diplocirrus glaucus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-
P0881	Flabelligera affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0919	Mediomastus fragilis	-	1	-	-	1	-	-	-	-	-	-	14	-	-	-	-	1	-	-	-	-	-	-	-	-	1	3	1	-	-
P0920	Notomastus	2	2	-	1	4	2	-	5	1	1	-	15	-	-	9	-	3	13	7	-	1	-	-	-	-	68	2	10	-	1
P0925	Peresiella clymenoides	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0944	Praxillura longissima	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0955	Clymenura	-	1	-	4	1	1	2	1	2	2	5	-	-	-	8	-	3	3	1	-	-	-	1	-	5	-	1	2	6	1
P0955	Clymenura (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0963	Euclymene lumbricoides	-	-	-	1	-	1	1	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-
P0964	Euclymene oerstedii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0971	Praxillella affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0993	Opheliidae (juv)	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0999	Ophelia borealis	2	4	4	6	2	6	5	1	4	7	2	-	3	5	5	13	1	-	-	-	-	7	3	1	2	-	3	-	1	1
P1007	Travisia forbesii	1	-	-	1	-	-	-	-	3	2	2	-	-	2	-	2	-	-	-	-	-	1	-	1	2	-	-	-	-	-
P1014	Ophelina acuminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1022	Asclerocheilus intermedius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1026	Scalibregma celticum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
P1027	Scalibregma inflatum	1	-	-	-	1	-	-	-	-	-	-	9	-	-	-	-	1	1	-	-	-	-	-	-	-	2	-	-	-	-
P1062	Polygordius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
P1093	Galathowenia oculata	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1095	Myriochele danielsseni	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1098	Owenia fusiformis	2	1	-	3	5	1	3	-	1	1	P	-	-	-	8	2	-	-	-	-	-	1	-	P	1	-	3	-	1	2
P1102	Amphictene auricoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P1107	Lagis koreni	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P1111	Petta pusilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
P1135	Ampharete falcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1139	Ampharete lindstroemi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
P1147	Anobothrus gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1167	Sosane sulcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1175	Terebellides stroemi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1179	Terebellidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
P1185	Amphitritides gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-
P1190	Eupolymnia nesidensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
P1195	Lanice conchilega	3	-	1	1	5	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	1	4	-	-	-
P1211	Nicolea zostericola	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
P1215	Phisidia aurea	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	-
P1217	Pista cristata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1218	Pistella lornensis	1	-	3	-	-	2	1	4	1	1	-	6	-	-	10	-	5	9	-	-	2	1	-	-	1	-	-	6	3	-
P1235	Polycirrus	2	-	-	1	4	-	-	1	-	-	-	5	-	-	-	-	8	9	2	1	1	-	-	-	-	16	3	1	1	-
P1249	Parathelepus collaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P1254	Thelepus cincinnatus	1	-	-	4	2	2	-	1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3	5	-	-	-
P1264	Chone	-	-	-	-	-	-	1	-	-	-	-	18	-	-	2	-	3	11	13	1	5	-	-	-	-	41	3	-	-	-
P1269	Chone filicaudata	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	3	-	-	-	-	6	-	1	-	-
P1271	Demonax	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P1277	Euchone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1289	Jasmineira caudata	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	1	8	1	-	27	-	1	-	-	14	-	-	-	-
P1290	Jasmineira elegans	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	1	16	-	-	-	-	6	-	-	-	-
P1316	Pseudopotamilla reniformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1324	Serpulidae	2	-	-	-	-	-	-	-	-	-	1	6	-	-	-	-	-	-	-	20	16	-	-	-	-	8	2	2	-	-
P1334	Hydroides norvegica	-	-	-	-	-	-	-	-	-	-	-	7	-	-	1	-	1	-	-	5	9	-	-	-	-	10	2	6	-	-
P1341	Pomatoceros triqueter	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	42	52	-	-	-	-	6	-	-	-	-
P1343	Serpula vermicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1369	Circeis spirillum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	-	-	-	-	-	1	-	-	-
P1524	Grania	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Q0009	Nymphon hirtum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
Q0032	Callipallene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q0044	Anoplodactylus petiolatus	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
R0022	Scalpellum scalpellum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0041	Verruca stroemia	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	2	-	-	-	-
R0073	Balanidae	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0073	Balanidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-
R0076	Balanus balanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
	Cirratulus incertus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
P0840	Dodecaceria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7	-	-	-	2	-	-	-	-	-	-	-
P0840	Dodecaceria (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-
P0846	Tharyx killariensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
P0878	Diplocirrus glaucus	-	-	-	1	-	-	1	-	2	2	P	1	-	-	-	-	-	-	-	1	6	1	-	-	-	1	-	1	-	3
P0881	Flabelligera affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-
P0919	Mediomastus fragilis	-	-	-	-	2	-	2	-	10	1	-	-	-	-	2	-	-	1	2	-	-	-	5	4	-	3	-	-	-	1
P0920	Notomastus	-	-	-	-	61	1	1	2	2	-	1	1	1	19	7	2	-	-	-	4	-	1	3	3	1	-	-	8	8	3
P0925	Peresiella clymenoides	-	-	1	2	-	9	3	1	-	-	-	2	-	-	-	-	-	-	2	-	6	-	-	-	-	3	-	10	-	4
P0944	Praxillura longissima	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-
P0955	Clymenura	-	1	1	-	1	-	4	2	-	4	2	1	2	7	-	-	-	-	-	3	1	-	1	-	-	-	-	3	-	-
P0955	Clymenura (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
P0963	Euclymene lumbricoides	-	-	-	-	-	-	1	2	-	1	1	1	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-
P0964	Euclymene oerstedii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
P0971	Praxillella affinis	-	-	-	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0993	Opheliidae (juv)	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0999	Ophelia borealis	2	6	1	-	-	-	-	1	-	3	-	2	-	3	-	1	1	-	-	-	-	3	-	-	-	-	3	-	-	-
P1007	Travisia forbesii	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
P1014	Ophelina acuminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1022	Asclerocheilus intermedius	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1026	Scalibregma celticum	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1027	Scalibregma inflatum	-	-	-	-	8	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
P1062	Polygordius	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	37	-
P1093	Galathowenia oculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1095	Myriochele danielsseni	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P1098	Owenia fusiformis	-	2	2	2	-	1	3	2	-	4	2	2	2	-	-	-	1	-	-	1	1	2	-	-	1	-	1	1	-	1
P1102	Amphictene auricoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1107	Lagis koreni	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-
P1111	Petta pusilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-
P1135	Ampharete falcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1139	Ampharete lindstroemi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
P1147	Anobothrus gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1167	Sosane sulcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1175	Terebellides stroemi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P1179	Terebellidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1185	Amphitritides gracilis	-	-	-	-	-	-	-	-	2	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	4	-	1	-	-
P1190	Eupolymnia nesidensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1195	Lanice conchilega	1	-	1	1	1	1	2	1	-	1	3	-	1	2	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
P1211	Nicolea zostericola	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6	-
P1215	Phisidia aurea	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1217	Pista cristata	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
P1218	Pistella lornensis	-	-	-	-	2	-	1	2	-	3	1	-	-	15	-	-	-	-	-	1	-	-	-	-	3	-	2	-	-	-
P1235	Polycirrus	-	-	1	-	5	-	2	2	2	-	1	-	1	7	-	1	-	1	4	-	-	-	-	-	1	4	-	6	2	-
P1249	Parathelepus collaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
P1254	Thelepus cincinnatus	-	-	-	-	-	-	-	1	-	-	1	-	-	5	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-
P1264	Chone	1	-	-	-	129	-	-	-	14	-	2	-	-	-	23	5	-	-	2	1	-	-	50	10	1	-	-	2	14	1
P1269	Chone filicaudata	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	6	-	-	1	-
P1271	Demonax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1277	Euchone	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	1	5	-	-
P1289	Jasmineira caudata	-	-	-	-	33	-	-	-	32	-	-	-	-	-	-	-	-	3	14	-	-	-	20	1	-	1	-	7	4	-
P1290	Jasmineira elegans	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	1	13	-	-	-	4	1	2	-	-	-	1	-
P1316	Pseudopotamilla reniformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	1	-	-	-	-	-	-	-
P1324	Serpulidae	-	-	-	-	6	-	-	-	15	-	-	-	-	-	1	5	-	41	84	3	-	-	39	-	-	36	-	40	1	5
P1334	Hydroides norvegica	-	-	-	-	10	-	2	-	22	-	-	-	-	-	2	2	-	31	22	-	-	-	24	20	-	13	-	62	-	-
P1341	Pomatoceros triqueter	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	4	-	199	85	4	-	-	56	1	-	7	-	35	-	-
P1343	Serpula vermicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P1369	Circeis spirillum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1524	Grania	-	-	-	-	7	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-
Q0009	Nymphon hirtum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q0032	Callipallene	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Q0044	Anoplodactylus petiolatus	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1
R0022	Scalpellum scalpellum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0041	Verruca stroemia	-	-	-	-	42	-	-	-	-	-	-	-	-	-	-	-	-	28	100	2	-	-	7	3	-	4	-	14	19	-
R0073	Balanidae	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0073	Balanidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
R0076	Balanus balanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
	Cirratulus incertus	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0840	Dodecaceria	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0840	Dodecaceria (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0846	Tharyx killariensis	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0878	Diplocirrus glaucus	-	-	-	-	-	-	-	-	-	-	3	6	-	-	-	-	-	7	1	2	-	1	-	-	-	-	-
P0881	Flabelligera affinis	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0919	Mediomastus fragilis	-	-	-	-	7	-	-	-	5	-	6	1	-	-	10	5	5	2	1	-	4	-	-	-	1	-	-
P0920	Notomastus	-	-	-	-	4	11	5	2	17	2	1	1	20	-	24	1	72	1	1	1	31	1	-	-	14	-	-
P0925	Peresiella clymenoides	-	-	-	-	5	-	-	-	-	-	7	3	-	-	-	-	-	5	10	3	-	1	-	-	-	-	-
P0944	Praxillura longissima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0955	Clymenura	-	-	-	-	1	-	-	6	-	3	-	1	4	3	-	-	-	1	1	3	1	2	-	4	-	-	1
P0955	Clymenura (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P0963	Euclymene lumbricoides	-	-	-	-	-	-	-	-	-	1	3	1	-	2	-	-	-	-	1	1	-	1	-	-	-	-	-
P0964	Euclymene oerstedii	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-
P0971	Praxillella affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	5	-	-	-	-	-
P0993	Opheliidae (juv)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
P0999	Ophelia borealis	7	10	23	9	-	-	-	2	-	4	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	16	5
P1007	Travisia forbesii	1	2	P	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
P1014	Ophelina acuminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
P1022	Asclerocheilus intermedius	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-
P1026	Scalibregma celticum	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P1027	Scalibregma inflatum	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-
P1062	Polygordius	-	-	-	-	-	2	27	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	62	-	-
P1093	Galathowenia oculata	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	-	1	1	8	1	-	P	-	-	-	-	-
P1095	Myriochele danielsseni	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	3	6	5	-	-	-	-	-	-	-
P1098	Owenia fusiformis	-	-	-	-	-	-	-	2	1	5	3	1	-	4	-	4	2	1	-	6	-	4	P	1	-	-	-
P1102	Amphictene auricoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1107	Lagis koreni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1111	Petta pusilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-
P1135	Ampharete falcata	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1139	Ampharete lindstroemi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1147	Anobothrus gracilis	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1167	Sosane sulcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
P1175	Terebellides stroemi	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
P1179	Terebellidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1185	Amphitritides gracilis	-	-	-	-	1	-	1	-	-	1	-	-	-	-	1	-	8	-	-	-	-	1	-	-	-	-	-
P1190	Eupolymnia nesidensis	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P1195	Lanice conchilega	2	-	-	-	-	-	-	-	-	2	1	-	5	-	-	1	-	-	-	-	-	-	-	-	1	-	-
P1211	Nicolea zostericola	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1215	Phisidia aurea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
P1217	Pista cristata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1218	Pistella lornensis	2	-	1	-	-	-	-	4	2	2	-	-	2	6	-	-	-	-	-	1	2	3	2	2	-	-	1
P1235	Polycirrus	1	-	-	-	5	5	1	1	7	-	1	1	3	-	4	1	6	-	2	1	3	-	-	1	6	-	-
P1249	Parathelepus collaris	-	-	-	-	-	3	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-
P1254	Thelepus cincinnatus	-	-	-	-	-	-	1	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
P1264	Chone	-	-	-	-	-	15	17	-	74	-	-	-	153	-	265	-	193	-	1	-	116	-	1	-	-	-	-
P1269	Chone filicaudata	-	-	-	-	-	3	-	-	4	-	-	-	2	-	1	-	18	-	-	-	2	-	-	-	-	-	-
P1271	Demonax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
P1277	Euchone	-	-	1	-	1	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	2	1	-	-	-	-	-
P1289	Jasmineira caudata	-	-	-	-	5	3	2	-	22	-	-	-	35	-	41	-	48	-	-	-	8	-	-	-	-	-	-
P1290	Jasmineira elegans	-	-	-	-	1	4	-	-	4	-	-	-	25	-	17	-	34	-	-	-	7	-	-	-	-	-	-
P1316	Pseudopotamilla reniformis	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
P1324	Serpulidae	-	-	-	-	68	19	-	-	12	-	-	-	-	P	19	-	48	-	-	-	6	-	-	-	-	2	-
P1334	Hydroides norvegica	-	-	1	-	78	12	-	-	P	-	2	-	1	-	41	-	25	-	-	-	2	-	-	-	-	9	-
P1341	Pomatoceros triqueter	-	-	-	-	55	6	-	-	2	-	-	-	-	-	10	-	6	-	-	-	1	-	-	-	-	1	-
P1343	Serpula vermicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1369	Circeis spirillum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1524	Grania	-	-	-	-	1	2	7	-	1	-	-	-	4	-	2	-	1	-	-	-	-	-	-	-	5	-	-
Q0009	Nymphon hirtum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q0032	Callipallene	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q0044	Anoplodactylus petiolatus	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-
R0022	Scalpellum scalpellum	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0041	Verruca stroemia	-	-	-	-	14	-	1	2	-	-	-	-	-	-	47	-	5	-	-	-	-	-	-	-	8	-	-
R0073	Balanidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-
R0073	Balanidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0076	Balanus balanus	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
R0077	Balanus crenatus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
R0142	COPEPODA	2	3	1	1	1	1	1	1	1	-	-	1	-	1	1	-	-	1	-	-	12	4	9	-	5	2	-	2	1	-
R0142	COPEPODA (Type A)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2098	Artotrogus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
R2413	MYODOCOPIDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
S0005	Nebalia (juv)	-	-	-	-	-	2	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nebalia clausi	-	-	-	-	10	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0008	Nebalia herbsti	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0010	Sarsinebalia	1	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
S0031	Mysidae	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0041	Gastrosaccus lobatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0044	Gastrosaccus spinifer	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0102	Apherusa bispinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0107	Apherusa ovalipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0125	Monoculodes carinatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
S0128	Monoculodes subnudus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0131	Perioculodes longimanus	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
S0132	Pontocrates (Type A)	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
S0138	Synchelidium maculatum	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
S0140	Westwoodilla caecula	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0159	Amphilochus neapolitanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0177	Leucothoe incisa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S0178	Leucothoe lilljeborgi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0213	Stenothoe marina	-	-	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
S0248	Urothoe elegans	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	5	-	-	-	-	-	1	2	-	-
S0249	Urothoe marina	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0254	Harpinia antennaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0255	Harpinia crenulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S0256	Harpinia laevis	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0265	Parametaphoxus fultoni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0296	Hippomedon denticulatus	-	-	1	1	-	-	2	2	1	-	-	-	1	2	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-
S0301	Lepidepecreum longicorne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0321	Orchomenella nana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0328	Scopelocheirus hopei	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S0330	Socarnes erythrophthalmus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0335	Tmetonyx	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0343	Tryphosella nanoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S0347	Tryphosites longipes	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
S0360	Argissa hamatipes	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0380	Iphimedia minuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-
S0413	Atylus vedlomensis	-	1	-	-	4	-	1	-	-	-	-	1	-	-	-	-	2	-	3	1	-	-	-	-	-	5	-	3	-	-
S0427	Ampelisca brevicornis	-	-	-	-	1	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-	-	-
S0429	Ampelisca diadema	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
S0434	Ampelisca provincialis	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
S0438	Ampelisca spinipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0439	Ampelisca spooneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S0440	Ampelisca tenuicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	4	-	-
S0442	Ampelisca typica	-	-	-	1	-	-	-	2	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	1	-	2	1	-	-
S0452	Bathyporeia elegans	-	-	-	1	-	-	1	-	1	1	1	-	1	-	-	1	-	-	-	-	-	4	1	3	2	-	-	2	-	1
S0453	Bathyporeia gracilis	1	1	-	1	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-
S0454	Bathyporeia guilliamsoniana	-	-	-	-	-	-	-	-	3	3	-	-	1	5	2	1	-	-	-	-	-	2	-	1	-	-	-	-	-	1
S0459	Bathyporeia tenuipes	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0489	Megaluropus agilis	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
S0502	Ceradocus semiserratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0503	Cheirocratus (female)	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	2	3	-	-	-	-	-	-	1	-	-
S0504	Cheirocratus assimilis	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0505	Cheirocratus intermedius	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0519	Maera othonis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	-	-	-	-	1	-	-	-	-
S0539	Gammaropsis cornuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0540	Gammaropsis lobata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0541	Gammaropsis maculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	1	-	-	-
S0552	Photis longicaudata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0561	Ericthonius (female)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	1	-	-	-
S0564	Ericthonius punctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	1	-	-	-
S0577	Aoridae (female)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0588	Leptocheirus hirsutimanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
R0077	Balanus crenatus	-	-	-	-	5	-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R0142	COPEPODA	-	-	-	3	1	1	1	-	3	-	1	8	-	1	-	-	-	1	-	-	1	1	-	5	17	3	1	8	4	-
R0142	COPEPODA (Type A)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
R2098	Artotrogus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
R2413	MYODOCOPIDA	-	-	-	-	5	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0005	Nebalia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nebalia clausi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0008	Nebalia herbsti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0010	Sarsinebalia	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0031	Mysidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0041	Gastrosaccus lobatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0044	Gastrosaccus spinifer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0102	Apherusa bispinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
S0107	Apherusa ovalipes	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0125	Monoculodes carinatus	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0128	Monoculodes subnudus	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
S0131	Perioculodes longimanus	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0132	Pontocrates (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0138	Synchelidium maculatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	1	-	1	-	-
S0140	Westwoodilla caecula	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0159	Amphilochus neapolitanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0177	Leucothoe incisa	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0178	Leucothoe lilljeborgi	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0213	Stenothoe marina	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0248	Urothoe elegans	-	1	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	1	-	-	5	-	-
S0249	Urothoe marina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	13	-	-	-	-
S0254	Harpinia antennaria	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
S0255	Harpinia crenulata	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0256	Harpinia laevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0265	Parametaphoxus fultoni	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0296	Hippomedon denticulatus	1	1	-	-	-	-	-	1	-	-	1	1	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-
S0301	Lepidepecreum longicorne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	P
S0321	Orchomenella nana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
S0328	Scopelocheirus hopei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0330	Socarnes erythrophthalmus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-
S0335	Tmetonyx	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S0343	Tryphosella nanoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0347	Tryphosites longipes	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0360	Argissa hamatipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0380	Iphimedia minuta	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0413	Atylus vedlomensis	-	-	-	-	8	-	2	-	1	1	-	-	1	2	1	-	-	-	2	-	-	-	2	1	-	1	-	-	15	1
S0427	Ampelisca brevicornis	-	-	3	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S0429	Ampelisca diadema	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
S0434	Ampelisca provincialis	-	-	1	-	-	-	-	1	-	1	1	1	1	1	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-
S0438	Ampelisca spinipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0439	Ampelisca spooneri	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
S0440	Ampelisca tenuicornis	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
S0442	Ampelisca typica	-	1	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
S0452	Bathyporeia elegans	1	3	3	-	-	-	-	2	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-	4	-	-	-
S0453	Bathyporeia gracilis	-	3	1	-	-	1	1	2	-	2	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S0454	Bathyporeia guilliamsoniana	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0459	Bathyporeia tenuipes	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0489	Megaluropus agilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0502	Ceradocus semiserratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
S0503	Cheirocratus (female)	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	1	1	-	-	-	9	2	-	2	-	-	2	-
S0504	Cheirocratus assimilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S0505	Cheirocratus intermedius	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0519	Maera othonis	-	-	-	-	4	-	-	-	5	-	-	-	-	-	-	-	-	-	2	-	-	-	2	2	-	3	-	2	-	-
S0539	Gammaropsis cornuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
S0540	Gammaropsis lobata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
S0541	Gammaropsis maculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	1	-	1	-	-
S0552	Photis longicaudata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0561	Ericthonius (female)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S0564	Ericthonius punctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S0577	Aoridae (female)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
S0588	Leptocheirus hirsutimanus	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
R0077	Balanus crenatus	-	-	-	-	-	5	-	-	-	-	-	-	-	-	4	-	-	-	-	1	3	-	-	-	-	-	-
R0142	COPEPODA	1	3	19	2	7	2	-	3	-	2	2	3	3	6	1	-	2	1	3	-	-	-	-	1	-	1	2
R0142	COPEPODA (Type A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2098	Artotrogus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2413	MYODOCOPIDA	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-
S0005	Nebalia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nebalia clausi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0008	Nebalia herbsti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0010	Sarsinebalia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0031	Mysidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0041	Gastrosaccus lobatus	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0044	Gastrosaccus spinifer	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
S0102	Apherusa bispinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0107	Apherusa ovalipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0125	Monoculodes carinatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0128	Monoculodes subnudus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0131	Perioculodes longimanus	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0132	Pontocrates (Type A)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0138	Synchelidium maculatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0140	Westwoodilla caecula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0159	Amphilochus neapolitanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0177	Leucothoe incisa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0178	Leucothoe lilljeborgi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0213	Stenothoe marina	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
S0248	Urothoe elegans	-	-	-	-	3	-	-	-	5	-	3	2	-	-	-	1	-	-	-	-	2	1	1	-	-	-	-
S0249	Urothoe marina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S0254	Harpinia antennaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	1	-	-	-	-	-
S0255	Harpinia crenulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0256	Harpinia laevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0265	Parametaphoxus fultoni	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-
S0296	Hippomedon denticulatus	-	-	-	1	-	-	-	2	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0301	Lepidepecreum longicorne	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	1	-	-	-	-	-
S0321	Orchomenella nana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0328	Scopelocheirus hopei	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
S0330	Socarnes erythrophthalmus	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0335	Tmetonyx	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0343	Tryphosella nanoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0347	Tryphosites longipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S0360	Argissa hamatipes	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0380	Iphimedia minuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0413	Atylus vedlomensis	2	-	-	-	2	2	8	-	1	-	-	-	6	1	3	-	1	-	-	1	5	-	-	-	-	-	-
S0427	Ampelisca brevicornis	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0429	Ampelisca diadema	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0434	Ampelisca provincialis	-	-	-	-	-	-	-	2	-	-	-	-	-	3	-	1	-	-	-	1	-	-	-	-	-	-	-
S0438	Ampelisca spinipes	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S0439	Ampelisca spooneri	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
S0440	Ampelisca tenuicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
S0442	Ampelisca typica	1	3	1	1	3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
S0452	Bathyporeia elegans	-	2	-	-	1	-	-	6	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
S0453	Bathyporeia gracilis	-	-	-	-	-	-	-	5	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-
S0454	Bathyporeia guilliamsoniana	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	6
S0459	Bathyporeia tenuipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S0489	Megaluropus agilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0502	Ceradocus semiserratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S0503	Cheirocratus (female)	-	-	-	-	1	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-
S0504	Cheirocratus assimilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0505	Cheirocratus intermedius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0519	Maera othonis	-	-	-	-	-	3	-	-	1	-	-	-	3	-	6	-	23	-	-	-	-	-	-	-	-	-	-
S0539	Gammaropsis cornuta	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0540	Gammaropsis lobata	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0541	Gammaropsis maculata	-	-	-	-	5	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S0552	Photis longicaudata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
S0561	Ericthonius (female)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0564	Ericthonius punctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0577	Aoridae (female)	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0588	Leptocheirus hirsutimanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
S0611	Crassicorophium crassicorne	3	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	1	-	1	-
S0619	Siphonoecetes striatus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
S0622	Unciola planipes	-	-	-	-	-	-	1	-	-	1	1	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0651	Pariambus typicus	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0657	Phtisica marina	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-
S0659	Pseudoprotella phasma	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0740	Themisto abyssorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0792	Gnathiidae (female)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
S0792	Gnathiidae (juv)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S0794	Gnathia dentata (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0796	Gnathia oxyuraea	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-
S0797	Gnathia vorax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0892	Janira maculosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0952	Astacilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
S0949	Arcturella (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0951	Arcturella dilatata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1142	Tanaopsis graciloides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1194	Bodotria arenosa	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1210	Eudorellopsis deformis	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
S1254	Diastylis rugosa	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1264	Euphausiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1268	Nyctiphanes couchi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1276	DECAPODA (megalopa)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
S1276	DECAPODA (zoea)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
S1334	Hippolytidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1344	Eualus occultus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1345	Eualus pusiolus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1350	Hippolyte varians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1363	Processa canaliculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S1374	Pandalina brevirostris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	1	-	-
S1377	Pandalus montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1418	Upogebia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S1445	Paguridae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	6	-	-	-	-	-	-	-	-	-
S1448	Anapagurus hyndmanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (megalopa)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1472	Galathea intermedia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
S1472	Galathea intermedia (juv)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	31	-	-	-	-	2	-	-	-	-
S1474	Galathea nexa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1482	Pisidia longicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	10	-	-	-	-	-	-	-	-	-
S1504	Ebalia (juv)	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S1505	Ebalia cranchii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1508	Ebalia tuberosa	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-
S1515	Maja brachydactyla (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1529	Macropodia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S1535	Eurynome (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1536	Eurynome aspera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1555	Atelecyclus rotundatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S1555	Atelecyclus rotundatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
S1577	Liocarcinus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	2	-	-	-
S1584	Liocarcinus pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1609	Monodaeus couchi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0053	Leptochiton asellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	12	15	-	-	-	-	8	-	1	-	-
W0088	GASTROPODA (larva)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0106	Emarginula fissura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
W0174	Jujubinus montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0161	Gibbula tumida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	-	-	-	-	4	-	-	-	-
W0182	Calliostoma zizyphinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0371	Onoba semicostata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0430	Aporrhais pespelecani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polinices (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
	Polinices catena	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0490	Polinices montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0491	Polinices pulchellus	2	2	-	2	-	-	1	1	-	1	-	2	1	1	-	1	1	-	-	-	-	-	1	-	3	-	1	-	2	1

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
S0611	Crassicorophium crassicorne	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-
S0619	Siphonoecetes striatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0622	Unciola planipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0651	Pariambus typicus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0657	Phtisica marina	1	-	-	-	-	-	-	-	-	-	-	-	3	4	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-
S0659	Pseudoprotella phasma	-	-	-	-	-	-	3	-	-	-	-	-	-	3	-	-	-	-	1	-	-	-	2	1	-	-	-	-	-	-
S0740	Themisto abyssorum	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0792	Gnathiidae (female)	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	1
S0792	Gnathiidae (juv)	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-
S0794	Gnathia dentata (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
S0796	Gnathia oxyuraea	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	3	-	-	7	-	4	-	1
S0797	Gnathia vorax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0892	Janira maculosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S0952	Astacilla	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
S0949	Arcturella (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0951	Arcturella dilatata	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1142	Tanaopsis graciloides	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	1	-	-
S1194	Bodotria arenosa	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-
S1210	Eudorellopsis deformis	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-
S1254	Diastylis rugosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-
S1264	Euphausiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
S1268	Nyctiphanes couchi	-	-	-	-	-	P	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1276	DECAPODA (megalopa)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S1276	DECAPODA (zoea)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1334	Hippolytidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
S1344	Eualus occultus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S1345	Eualus pusiolus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
S1350	Hippolyte varians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
S1363	Processa canaliculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1374	Pandalina brevirostris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1377	Pandalus montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1418	Upogebia (juv)	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-
S1445	Paguridae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-
S1448	Anapagurus hyndmanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (megalopa)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1472	Galathea intermedia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-
S1472	Galathea intermedia (juv)	-	-	-	-	3	-	-	-	4	-	-	-	-	1	-	-	-	11	17	-	-	-	10	4	-	-	-	-	-	-
S1474	Galathea nexa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	-	-	-	-
S1482	Pisidia longicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	20	-	-	-	-	-	-	-	-	-	-	-
S1504	Ebalia (juv)	-	-	-	-	P	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1505	Ebalia cranchii	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1508	Ebalia tuberosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
S1515	Maja brachydactyla (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S1529	Macropodia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1535	Eurynome (juv)	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1536	Eurynome aspera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
S1555	Atelecyclus rotundatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S1555	Atelecyclus rotundatus (juv)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1577	Liocarcinus (juv)	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-
S1584	Liocarcinus pusillus	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1609	Monodaeus couchi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W0053	Leptochiton asellus	-	-	-	-	13	-	-	-	6	-	-	-	-	-	2	1	-	6	27	-	-	-	7	1	-	5	-	1	19	-
W0088	GASTROPODA (larva)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0106	Emarginula fissura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
W0174	Jujubinus montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0161	Gibbula tumida	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	2	6	-	-	-	1	-	-	-	-	-	-	-
W0182	Calliostoma zizyphinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
W0371	Onoba semicostata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1	-	-	-	-	-	-	-
W0430	Aporrhais pespelecani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	Polinices (juv)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
	Polinices catena	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0490	Polinices montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-
W0491	Polinices pulchellus	1	-	-	1	1	-	-	-	-	-	-	1	1	2	-	1	-	-	-	-	-	-	1	-	-	1	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
S0611	Crassicorophium crassicorne	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
S0619	Siphonoecetes striatus	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
S0622	Unciola planipes	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
S0651	Pariambus typicus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0657	Phtisica marina	-	-	-	-	3	-	-	-	-	1	2	-	-	-	-	-	-	5	-	-	1	-	-	-	-	-	-
S0659	Pseudoprotella phasma	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0740	Themisto abyssorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0792	Gnathiidae (female)	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	3	-	-	-	-	-	-
S0792	Gnathiidae (juv)	-	-	-	-	5	4	-	-	-	-	-	-	-	-	1	-	4	-	1	-	1	-	-	-	-	-	-
S0794	Gnathia dentata (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0796	Gnathia oxyuraea	-	-	-	-	16	-	-	-	-	-	-	-	1	-	1	1	21	-	-	-	6	-	-	-	-	-	-
S0797	Gnathia vorax	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0892	Janira maculosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0952	Astacilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S0949	Arcturella (juv)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
S0951	Arcturella dilatata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1142	Tanaopsis graciloides	-	-	-	-	-	-	-	-	-	-	2	1	-	1	-	1	-	5	-	1	-	-	-	-	-	-	-
S1194	Bodotria arenosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1210	Eudorellopsis deformis	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1254	Diastylis rugosa	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
S1264	Euphausiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1268	Nyctiphanes couchi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
S1276	DECAPODA (megalopa)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P
S1276	DECAPODA (zoea)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1334	Hippolytidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1344	Eualus occultus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1345	Eualus pusiolus	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1350	Hippolyte varians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1363	Processa canaliculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1374	Pandalina brevirostris	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
S1377	Pandalus montagui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1418	Upogebia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-
S1445	Paguridae (juv)	-	-	-	-	3	-	-	-	3	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
S1448	Anapagurus hyndmanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (megalopa)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1470	Galathea (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1472	Galathea intermedia	-	-	-	-	6	3	-	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	-
S1472	Galathea intermedia (juv)	-	-	-	-	9	8	2	-	-	-	-	-	-	-	6	-	13	-	1	-	-	-	-	-	-	-	-
S1474	Galathea nexa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1482	Pisidia longicornis	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1504	Ebalia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	1	-	-	-	-	-	-	-	-	-	-
S1505	Ebalia cranchii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-
S1508	Ebalia tuberosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	1	-	-	-	-	-	-	-	-	-	-
S1515	Maja brachydactyla (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1519	Hyas coarctatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1529	Macropodia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1535	Eurynome (juv)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1536	Eurynome aspera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1555	Atelecyclus rotundatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1555	Atelecyclus rotundatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1577	Liocarcinus (juv)	-	-	-	-	1	-	P	-	2	1	-	-	1	-	-	-	2	-	-	-	2	-	-	-	-	-	-
S1584	Liocarcinus pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1609	Monodaeus couchi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0053	Leptochiton asellus	-	-	-	-	12	23	8	-	12	-	-	-	-	-	13	-	7	-	-	-	2	-	-	-	-	-	-
W0088	GASTROPODA (larva)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0106	Emarginula fissura	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W0174	Jujubinus montagui	-	-	-	-	-	-	4	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W0161	Gibbula tumida	-	-	-	-	1	11	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-
W0182	Calliostoma zizyphinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0371	Onoba semicostata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0430	Aporrhais pespelecani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polinices (juv)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
	Polinices catena	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0490	Polinices montagui	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0491	Polinices pulchellus	-	3	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
W0443	Capulus ungaricus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0602	Eulima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0603	Eulima bilineata	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0634	Melanella alba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0669	Vitreolina philippi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
W0708	Buccinum undatum (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W0718	Colus (eggs)	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colus gracilis	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0747	Hinia incrassata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	2	-	-	-	-	-	-	-	-	-
W0776	Haedropleura septangularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0798	Mangelia brachystoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0801	Mangelia nebula	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0861	Raphitoma linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0985	Turbonilla crenata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0965	Partulida pellucida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0909	Odostomia acuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
W0913	Odostomia plicata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0915	Odostomia turrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1006	Acteon tornatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1036	Philine	-	-	1	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1028	Cylichna cylindracea	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1243	NUDIBRANCHIA (eggs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1346	Aegires punctilucens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1333	Acanthodoris pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1320	Onchidoris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	3	-	-	-	-	-	-	-	-	-
W1325	Onchidoris muricata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	1	-	-	-
W1354	Limacia clavigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1267	Dendronotus frondosus (juv)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1270	Doto	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1246	Tritonia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1415	Flabellinidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1519	Antalis entalis	-	1	-	1	-	1	1	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1
W1563	Nuculidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
W1569	Nucula nitidosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1570	Nucula nucleus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
W1577	Nuculoma tenuis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1688	Glycymeris glycymeris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W1688	Glycymeris glycymeris (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1715	Crenella decussata	-	3	3	1	-	1	3	3	1	7	2	-	-	-	4	-	1	-	-	-	-	1	3	-	-	5	-	1	10	3
W1698	Modiolus (juv)	-	-	-	-	-	-	-	-	1	-	-	2	-	-	1	-	-	1	-	2	-	-	-	-	-	7	1	-	-	-
W1702	Modiolus modiolus	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1746	Limatula subauriculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1786	Palliolum tigerinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
W1773	Aequipecten opercularis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1805	Anomiidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	26	1	-	-	-	-	-	-	-	-	-
W1829	Lucinoma borealis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1829	Lucinoma borealis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1837	Thyasira flexuosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1864	Diplodonta rotundata	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
W1864	Diplodonta rotundata (juv)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1875	Kellia suborbicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1882	Semierycina nitida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
W1892	Montacuta substriata	-	-	-	-	-	-	-	-	-	-	-	23	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
W1906	Kurtiella bidentata	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-
W1902	Tellimya ferruginosa	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	-	-	-
W1921	Astartidae (juv)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
W1929	Goodallia triangularis	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
W1936	Tridonta montagui	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W1951	Parvicardium ovale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-
W1952	Parvicardium scabrum	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1973	Spisula (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
W1977	Spisula solida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1977	Spisula solida (juv)	-	-	-	-	-	-	-	-	-	2	1	-	1	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	1	2
W1996	Ensis (juv)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1998	Ensis arcuatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1998	Ensis arcuatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
W0443	Capulus ungaricus (juv)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
W0602	Eulima	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
W0603	Eulima bilineata	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0634	Melanella alba	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0669	Vitreolina philippi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0708	Buccinum undatum (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
W0718	Colus (eggs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colus gracilis	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0747	Hinia incrassata	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	13	3	-	-	-	-	-	-	-	-	-	-	-
W0776	Haedropleura septangularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0798	Mangelia brachystoma	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0801	Mangelia nebula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0861	Raphitoma linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
W0985	Turbonilla crenata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
W0965	Partulida pellucida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W0909	Odostomia acuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0913	Odostomia plicata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W0915	Odostomia turrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
W1006	Acteon tornatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
W1036	Philine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
W1028	Cylichna cylindracea	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W1243	NUDIBRANCHIA (eggs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1346	Aegires punctilucens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
W1333	Acanthodoris pilosa	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1320	Onchidoris	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
W1325	Onchidoris muricata	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	2	2	-	-	-	1	-	-	3	-	-	-	-
W1354	Limacia clavigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1267	Dendronotus frondosus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1270	Doto	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1246	Tritonia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W1415	Flabellinidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1519	Antalis entalis	-	-	-	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
W1563	Nuculidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W1569	Nucula nitidosa	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	3
W1570	Nucula nucleus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	12	6	-	-	-	-	-	-	-	-	2	-	-
W1577	Nuculoma tenuis	-	-	-	1	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1688	Glycymeris glycymeris	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
W1688	Glycymeris glycymeris (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
W1715	Crenella decussata	-	-	3	-	7	-	1	-	-	4	-	-	6	1	4	-	2	-	-	-	-	1	-	1	-	-	3	1	4	-
W1698	Modiolus (juv)	-	-	-	-	5	-	-	-	1	-	-	-	-	3	-	1	-	1	-	-	-	-	1	-	-	-	-	-	5	-
W1702	Modiolus modiolus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1746	Limatula subauriculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1786	Palliolum tigerinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-
W1773	Aequipecten opercularis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1805	Anomiidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	22	7	-	-	-	1	-	-	-	-	-	-	-
W1829	Lucinoma borealis	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1829	Lucinoma borealis (juv)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1837	Thyasira flexuosa	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1864	Diplodonta rotundata	-	-	-	1	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
W1864	Diplodonta rotundata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1875	Kellia suborbicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1882	Semierycina nitida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1892	Montacuta substriata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1906	Kurtiella bidentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
W1902	Tellimya ferruginosa	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1921	Astartidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
W1929	Goodallia triangularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	-
W1936	Tridonta montagui	-	-	-	-	-	-	-	-	1	1	-	1	-	-	3	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-
W1951	Parvicardium ovale	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	6	1	-	-	-	-	-	-	-	-	1	-	-
W1952	Parvicardium scabrum	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
W1973	Spisula (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
W1977	Spisula solida	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
W1977	Spisula solida (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1996	Ensis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1998	Ensis arcuatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
W1998	Ensis arcuatus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
W0443	Capulus ungaricus (juv)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W0602	Eulima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0603	Eulima bilineata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0634	Melanella alba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0669	Vitreolina philippi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0708	Buccinum undatum (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0718	Colus (eggs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-
	Colus gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0747	Hinia incrassata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0776	Haedropleura septangularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
W0798	Mangelia brachystoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0801	Mangelia nebula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0861	Raphitoma linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0985	Turbonilla crenata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0965	Partulida pellucida	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0909	Odostomia acuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W0913	Odostomia plicata	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W0915	Odostomia turrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1006	Acteon tornatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1036	Philine	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
W1028	Cylichna cylindracea	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-
W1243	NUDIBRANCHIA (eggs)	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1346	Aegires punctilucens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W1333	Acanthodoris pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1320	Onchidoris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1325	Onchidoris muricata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W1354	Limacia clavigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1267	Dendronotus frondosus (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1270	Doto	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1246	Tritonia (juv)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1415	Flabellinidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W1519	Antalis entalis	-	-	-	-	-	-	-	1	-	-	1	2	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-
W1563	Nuculidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1569	Nucula nitidosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-
W1570	Nucula nucleus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1577	Nuculoma tenuis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
W1688	Glycymeris glycymeris	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1688	Glycymeris glycymeris (juv)	-	-	1	-	-	-	6	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	1	-	-
W1715	Crenella decussata	2	2	7	-	-	-	-	6	2	1	-	-	-	2	3	-	1	-	-	-	2	1	1	-	4	-	3
W1698	Modiolus (juv)	-	-	-	-	-	20	1	-	2	-	-	-	1	-	4	-	1	-	-	-	1	-	-	-	1	-	-
W1702	Modiolus modiolus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1746	Limatula subauriculata	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1786	Palliolum tigerinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1773	Aequipecten opercularis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1805	Anomiidae (juv)	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1829	Lucinoma borealis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1829	Lucinoma borealis (juv)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
W1837	Thyasira flexuosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W1864	Diplodonta rotundata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1864	Diplodonta rotundata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1875	Kellia suborbicularis	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1882	Semierycina nitida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1892	Montacuta substriata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-
W1906	Kurtiella bidentata	-	-	-	-	10	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
W1902	Tellimya ferruginosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
W1921	Astartidae (juv)	-	-	6	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1929	Goodallia triangularis	-	-	3	-	-	-	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-
W1936	Tridonta montagui	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	3	-	-	-	-	-	-
W1951	Parvicardium ovale	-	-	-	-	-	3	-	-	-	-	-	-	-	-	1	-	4	-	-	-	-	-	-	-	-	-	-
W1952	Parvicardium scabrum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1973	Spisula (juv)	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
W1977	Spisula solida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1977	Spisula solida (juv)	-	1	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
W1996	Ensis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1998	Ensis arcuatus	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
W1998	Ensis arcuatus (juv)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
W2006	Phaxas pellucidus	1	2	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	1	-	-	-	1	-	-
W2015	Arcopagia crassa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2015	Arcopagia crassa (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2019	Fabulina fabula	2	6	6	3	1	-	1	-	-	-	-	-	2	1	-	-	1	-	-	-	-	1	-	-	-	-	2	-	-	-
W2023	Moerella pygmaea	1	-	2	-	-	1	2	4	7	20	13	-	1	21	-	18	1	1	-	-	-	-	2	2	-	1	-	-	-	5
W2054	Solecurtus scopula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2051	Gari fervensis	-	1	2	-	-	-	2	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	2	1	3	-	-	3	1	-
W2051	Gari fervensis (juv)	2	13	2	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2049	Gari tellinella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
W2049	Gari tellinella (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2062	Abra prismatica	2	4	3	2	2	1	1	-	4	1	3	-	2	-	-	2	-	-	-	-	-	-	-	1	-	-	1	-	1	3
W2072	Arctica islandica (juv)	-	1	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2091	Circomphalus casina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
W2091	Circomphalus casina (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2095	Gouldia minima	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2126	Dosinia (juv)	1	1	-	2	-	-	-	-	-	6	2	2	2	1	6	-	-	-	-	-	-	2	11	4	-	1	1	4	-	1
W2128	Dosinia lupinus	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
W2130	Dosinia exoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2110	Tapes (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-
W2113	Tapes rhomboides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
W2113	Tapes rhomboides (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chamelea striatula	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
	Chamelea striatula (juv)	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	-	5	-	1	-	-	-	-	-
W2100	Clausinella fasciata	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2100	Clausinella fasciata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2104	Timoclea ovata	-	8	-	2	-	-	-	-	2	-	-	1	-	1	-	-	-	-	1	1	1	-	1	-	-	1	-	-	-	-
W2139	Mysia undata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2147	Mya truncata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
W2152	Sphenia binghami	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W2166	Hiatella arctica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	10	2	-	-	-	-	1	-	-	-	-
W2227	Thracia (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2233	Thracia villosiuscula	-	-	-	-	-	-	-	-	2	1	1	1	-	-	2	1	-	1	-	-	1	-	-	-	-	-	-	-	1	1
W2239	Cochlodesma praetenue	-	7	2	8	-	1	6	1	-	7	3	1	9	7	2	5	-	-	-	-	-	12	4	8	20	-	6	4	19	9
W2239	Cochlodesma praetenue (juv)	2	3	10	13	4	3	1	1	4	6	2	1	9	5	11	3	2	-	-	-	-	-	4	2	5	-	5	6	6	4
W2247	Lyonsia norwegica	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0013	Crisia	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0027	Tubulipora	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P	-	P	P	P	P	-	P	-	-	P	P	-	-	-
Y0039	Eurystrotos compacta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-
Y0042	Plagioecia sarniensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	-	-
Y0054	Entalophoroecia deflexa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	P	-	P	P	-	P	P	-	-	-
Y0066	Disporella hispida	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	P	P	P	-	P	-	-	P	-	-	-	-
Y0070	CTENOSTOMATIDA (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0079	Alcyonidium mamillatum	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0080	Alcyonidium mytili	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0081	Alcyonidium parasiticum	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0091	Nolella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0131	Vesicularia spinosa	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0153	Aetea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0165	Eucratea loricata	P	P	P	P	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	-	P	-	-	-	P	P	P	P	P	P
Y0178	Electra pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0180	Pyripora catenularia	-	-	-	-	-	-	-	P	-	-	-	P	-	-	P	-	-	-	-	P	-	-	-	-	-	P	P	-	-	-
Y0187	Flustra foliacea	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-
Y0194	Securiflustra securifrons	-	P	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0208	Alderina imbellis	-	-	-	-	-	-	-	-	-	-	-	P	-	-	P	-	-	-	P	-	-	-	-	-	-	P	-	P	-	-
Y0214	Tegella unicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0222	Amphiblestrum auritum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0223	Amphiblestrum flemingii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Y0228	Ramphonotus minax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0261	Beania mirabilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0279	Scrupocellaria scruposa	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	P	-	P	-	-	-	P	P	P	-	-	-
Y0299	Cellaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0310	Cribrilina punctata	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0332	Hippothoa divaricata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	P	-	-	-
Y0333	Hippothoa flagellum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
Y0344	Chorizopora brongniarti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Y0359	Escharoides mamillata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
W2006	Phaxas pellucidus	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1
W2015	Arcopagia crassa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2015	Arcopagia crassa (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
W2019	Fabulina fabula	-	4	1	8	-	5	1	2	-	-	7	4	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
W2023	Moerella pygmaea	5	-	1	-	-	-	-	-	-	-	-	-	-	3	1	1	2	-	-	-	-	-	1	-	-	-	-	-	3	-
W2054	Solecurtus scopula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
W2051	Gari fervensis	1	1	4	-	-	-	-	1	-	-	2	1	1	-	-	-	-	-	-	2	-	1	-	-	-	-	-	1	-	1
W2051	Gari fervensis (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
W2049	Gari tellinella	-	-	-	-	3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	1	-	-	-	-	1	-
W2049	Gari tellinella (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-
W2062	Abra prismatica	-	3	4	-	-	-	1	1	-	2	1	1	3	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
W2072	Arctica islandica (juv)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
W2091	Circomphalus casina	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
W2091	Circomphalus casina (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2095	Gouldia minima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	3	-
W2126	Dosinia (juv)	2	-	3	-	-	-	1	-	-	-	3	-	1	1	-	-	4	-	-	-	-	1	-	-	-	-	1	3	8	-
W2128	Dosinia lupinus	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2130	Dosinia exoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2110	Tapes (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
W2113	Tapes rhomboides	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P	1	-	-	-	-	-	-	-	-	1	1	-
W2113	Tapes rhomboides (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chamelea striatula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-
	Chamelea striatula (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2100	Clausinella fasciata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	2	-	-	-	-	-	5	-
W2100	Clausinella fasciata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
W2104	Timoclea ovata	-	-	1	1	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	1	-	2	2	-	3	5	-
W2139	Mysia undata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
W2147	Mya truncata (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2152	Sphenia binghami	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-
W2166	Hiatella arctica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	3	-	-	-	-	-	-	4	-	-	-	-
W2227	Thracia (juv)	-	-	-	3	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	1	-	7	-
W2233	Thracia villosiuscula	-	1	-	-	4	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-
W2239	Cochlodesma praetenue	2	8	13	-	-	1	4	8	-	5	6	6	1	1	-	-	11	-	-	2	2	11	-	1	-	-	16	1	-	-
W2239	Cochlodesma praetenue (juv)	4	6	21	-	-	4	6	5	1	4	4	7	11	-	-	-	-	1	-	8	3	8	-	1	1	-	4	5	-	1
W2247	Lyonsia norwegica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0013	Crisia	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-
Y0027	Tubulipora	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	P	-	-	P	P	-	-	P	-	-	-	-	P	-	P
Y0039	Eurystrotos compacta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	P	P	-	-	P	-	-	-	-	-	-	-
Y0042	Plagioecia sarniensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0054	Entalophoroecia deflexa	-	-	-	-	P	-	-	-	P	-	-	-	-	-	P	P	-	-	P	P	-	-	P	P	-	-	-	-	P	-
Y0066	Disporella hispida	-	P	-	-	-	-	-	-	P	-	-	-	P	-	P	P	-	-	P	P	-	-	P	-	-	-	-	-	P	-
Y0070	CTENOSTOMATIDA (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0079	Alcyonidium mamillatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0080	Alcyonidium mytili	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0081	Alcyonidium parasiticum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P
Y0091	Nolella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0131	Vesicularia spinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0153	Aetea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0165	Eucratea loricata	-	P	P	P	P	P	P	P	P	P	P	P	-	P	P	-	-	P	-	P	-	-	-	-	-	-	-	P	P	P
Y0178	Electra pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0180	Pyripora catenularia	-	P	-	-	P	-	-	-	P	-	-	-	P	-	-	P	-	-	P	-	-	-	P	-	-	-	-	P	P	P
Y0187	Flustra foliacea	-	-	-	P	P	-	-	-	-	-	-	-	-	P	P	-	-	P	-	-	-	-	-	P	-	-	-	-	-	-
Y0194	Securiflustra securifrons	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P	-	-
Y0208	Alderina imbellis	-	-	-	-	P	-	-	-	P	-	-	-	-	-	-	P	-	-	P	P	-	-	P	P	-	-	-	P	P	P
Y0214	Tegella unicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	-	-
Y0222	Amphiblestrum auritum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0223	Amphiblestrum flemingii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	-	-	-	P	P	P
Y0228	Ramphonotus minax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0261	Beania mirabilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0279	Scrupocellaria scruposa	-	-	P	-	P	-	-	-	-	-	-	-	-	P	P	P	-	-	P	-	-	P	P	P	P	P	-	P	P	P
Y0299	Cellaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	P	P	-
Y0310	Cribrilina punctata	-	P	-	P	P	-	P	-	P	-	-	-	-	P	P	P	-	-	-	P	-	-	P	-	-	-	-	P	-	-
Y0332	Hippothoa divaricata	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-
Y0333	Hippothoa flagellum	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-	-	P	-
Y0344	Chorizopora brongniarti	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-
Y0359	Escharoides mamillata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
W2006	Phaxas pellucidus	-	-	-	-	-	-	-	1	-	-	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
W2015	Arcopagia crassa	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
W2015	Arcopagia crassa (juv)	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2019	Fabulina fabula	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	2	-	1	-	-	-	-	-
W2023	Moerella pygmaea	5	1	5	4	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	15	5
W2054	Solecurtus scopula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2051	Gari fervensis	-	1	2	-	-	-	-	1	-	1	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	1
W2051	Gari fervensis (juv)	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2049	Gari tellinella	-	-	-	-	-	1	3	-	-	-	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W2049	Gari tellinella (juv)	-	-	-	-	-	1	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2062	Abra prismatica	-	-	-	-	-	-	-	2	-	4	1	-	-	2	-	1	-	1	-	-	-	3	-	-	-	-	-
W2072	Arctica islandica (juv)	-	1	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
W2091	Circomphalus casina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2091	Circomphalus casina (juv)	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2095	Gouldia minima	-	-	-	-	-	2	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W2126	Dosinia (juv)	-	3	-	1	3	-	1	3	-	-	-	1	-	-	1	-	-	1	-	2	-	-	-	-	-	-	-
W2128	Dosinia lupinus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W2130	Dosinia exoleta	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2110	Tapes (juv)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
W2113	Tapes rhomboides	-	-	-	-	-	-	-	-	P	-	-	-	8	-	1	-	3	-	-	-	-	-	-	-	-	-	-
W2113	Tapes rhomboides (juv)	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chamelea striatula	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-
	Chamelea striatula (juv)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2100	Clausinella fasciata	-	-	-	-	-	5	9	-	1	-	-	-	-	-	15	-	2	-	-	-	-	-	-	-	-	-	-
W2100	Clausinella fasciata (juv)	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2104	Timoclea ovata	-	-	-	-	17	3	3	1	-	2	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-
W2139	Mysia undata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2147	Mya truncata (juv)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2152	Sphenia binghami	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W2166	Hiatella arctica	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
W2227	Thracia (juv)	-	-	1	1	-	3	9	-	3	-	-	-	-	-	4	-	-	-	-	-	-	-	-	2	-	-	-
W2233	Thracia villosiuscula	2	-	-	-	-	-	-	-	1	1	-	-	-	-	2	-	3	-	-	-	-	-	-	-	-	-	-
W2239	Cochlodesma praetenue	4	8	8	1	-	-	-	11	-	6	-	-	-	8	-	-	-	-	-	5	-	-	-	-	-	8	4
W2239	Cochlodesma praetenue (juv)	2	7	1	2	3	-	-	3	-	5	1	-	-	3	-	-	-	-	-	3	-	-	-	1	-	3	2
W2247	Lyonsia norwegica	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Y0013	Crisia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0027	Tubulipora	P	-	-	-	P	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	P	P	-
Y0039	Eurystrotos compacta	-	-	-	-	P	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0042	Plagioecia sarniensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0054	Entalophoroecia deflexa	-	-	-	-	-	P	P	-	-	-	-	-	P	-	P	-	-	-	-	-	P	-	-	-	P	-	-
Y0066	Disporella hispida	-	-	-	P	-	-	P	-	-	-	-	-	P	-	P	-	-	-	-	-	P	-	-	-	P	-	-
Y0070	CTENOSTOMATIDA (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0079	Alcyonidium mamillatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0080	Alcyonidium mytili	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0081	Alcyonidium parasiticum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	-	-
Y0091	Nolella	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0131	Vesicularia spinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0153	Aetea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0165	Eucratea loricata	-	P	-	-	P	P	-	-	P	-	P	-	P	-	P	-	P	P	-	P	P	P	-	P	P	-	P
Y0178	Electra pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-
Y0180	Pyripora catenularia	-	-	-	-	-	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-
Y0187	Flustra foliacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	P	-	P	-
Y0194	Securiflustra securifrons	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	P	-	-	-
Y0208	Alderina imbellis	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	P	-	-
Y0214	Tegella unicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-
Y0222	Amphiblestrum auritum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0223	Amphiblestrum flemingii	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0228	Ramphonotus minax	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0261	Beania mirabilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0279	Scrupocellaria scruposa	-	-	-	-	-	P	P	P	P	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	P	-
Y0299	Cellaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0310	Cribrilina punctata	-	-	-	P	-	-	P	-	-	-	-	P	-	P	P	-	-	-	-	-	-	-	-	-	P	P	-
Y0332	Hippothoa divaricata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0333	Hippothoa flagellum	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0344	Chorizopora brongniarti	-	-	-	P	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	P	-
Y0359	Escharoides mamillata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation.
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31
Y0364	Escharella immersa	-	-	-	-	-	-	P	P	-	-	-	P	-	-	-	-	-	P	P	P	P	-	P	-	-	P	P	P	-	-
Y0370	Escharella ventricosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-
Y0376	Neolagenipora collaris	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	-	-
Y0385	Porella concinna	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-	P	-	-	P	P	-	-	-
Y0393	Palmiskenea skenei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
Y0414	Hippoporina pertusa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
Y0421	Phylactella labrosa	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0465	Parasmittina trispinosa	-	-	-	-	-	-	-	-	-	-	-	P	-	-	P	-	-	-	P	P	P	-	-	-	-	P	P	-	-	-
Y0468	Schizomavella auriculata	-	-	-	-	-	-	-	P	-	-	-	P	-	-	P	-	-	P	-	P	P	-	-	-	-	P	P	P	-	-
Y0474	Schizomavella linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	P	-	-	-	-	-	P	-	-	-	-
Y0480	Microporella ciliata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	P	-	-	-	-	P	-	-	-	-
Y0483	Fenestrulina malusii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	-
Y0485	Diporula verrucosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0502	Lagenipora lepralioides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0504	Turbicellepora avicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0533	Rhynchozoon bispinosum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZA0003	Phoronis	1	2	1	1	2	2	-	-	-	1	-	-	-	-	2	-	1	-	-	-	2	-	1	-	-	3	7	3	-	-
ZA0006	Phoronis ovalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0018	ASTEROIDEA (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
ZB0100	Asterias rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
ZB0124	Ophiothrix fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
ZB0128	Ophiocomina nigra (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
ZB0143	Ophiactis balli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
ZB0143	Ophiactis balli (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae (juv)	1	5	7	5	-	2	2	-	-	-	2	2	-	-	2	-	1	1	1	1	-	-	1	-	4	6	1	-	1	-
ZB0151	Acrocnida brachiata	-	P	P	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
ZB0154	Amphiura filiformis	1	3	P	-	-	-	3	-	P	-	-	-	1	-	1	P	-	-	-	-	-	-	-	-	-	P	-	1	-	-
ZB0157	Amphiura securigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
ZB0161	Amphipholis squamata	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	3	3	-	-	-	-	3	-	-	-	-
ZB0165	Ophiuridae (juv)	1	-	-	1	-	-	2	1	-	-	-	3	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	2	-	-
ZB0168	Ophiura albida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0167	Ophiocten affinis	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
ZB0190	ECHINOIDA (juv)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
ZB0193	Psammechinus miliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0198	Echinus esculentus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
ZB0212	Echinocyamus pusillus	3	3	9	5	4	7	6	-	10	2	8	1	6	3	17	12	2	3	-	-	-	3	4	4	7	1	13	5	11	8
ZB0213	SPATANGOIDA (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	-	2	1	-	-
ZB0219	Spatangus purpureus	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0220	Spatangus raschi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
ZB0224	Echinocardium flavescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-
ZB0266	Cucumariidae (juv)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0280	Leptopentacta elongata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0291	Leptosynapta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0294	Leptosynapta decaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
ZB0296	Leptosynapta inhaerens	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0300	Labidoplax digitata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZC0012	ENTEROPNEUSTA	-	-	-	P	-	-	-	-	2	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	1	-
ZD0002	ASCIDIACEA (juv)	-	-	-	-	-	-	-	4	1	-	-	-	3	-	4	-	3	-	-	-	-	-	-	-	-	P	1	-	4	3
ZD0102	Pelonaia corrugata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0112	Polycarpa fibrosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0120	Dendrodoa grossularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0128	Botrylloides leachi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
ZD0149	Molgula complanata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Branchiostoma lanceolatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
ZG0001	OSTEICHTHYES (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0086	Diplecogaster bimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0443	Ammotydes tobianus	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0455	Gobiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
	Total No. Species (S)	**65**	**60**	**55**	**69**	**52**	**44**	**56**	**57**	**51**	**41**	**30**	**106**	**30**	**26**	**75**	**30**	**65**	**53**	**51**	**90**	**98**	**36**	**37**	**26**	**36**	**112**	**96**	**77**	**41**	**34**
	Total No. Individuals (A)	**150**	**159**	**167**	**145**	**142**	**98**	**132**	**109**	**90**	**113**	**71**	**266**	**66**	**78**	**179**	**85**	**148**	**127**	**85**	**476**	**321**	**75**	**84**	**57**	**78**	**405**	**186**	**174**	**110**	**71**
	Biomass (g) (B)	**0.1875**	**0.3393**	**0.3164**	**0.7401**	**0.4615**	**0.5261**	**0.4642**	**0.1587**	**0.1763**	**0.1201**	**0.3008**	**2.8814**	**0.4015**	**0.0778**	**0.4298**	**0.1302**	**0.2921**	**0.5237**	**0.0758**	**6.5414**	**1.2873**	**0.4864**	**0.2469**	**0.1588**	**0.6082**	**1.6649**	**0.4054**	**0.4761**	**0.7806**	**0.2097**

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
Y0364	Escharella immersa	-	-	-	-	P	-	-	-	P	-	-	-	P	-	P	P	-	-	P	-	-	-	P	P	-	-	-	P	P	P
Y0370	Escharella ventricosa	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	P	-	-	P	-	-	-	P	-	-	-	-	-	-	-
Y0376	Neolagenipora collaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0385	Porella concinna	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	P	P	-	-	-	P	-	-	-	-	P	-	-
Y0393	Palmiskenea skenei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0414	Hippoporina pertusa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0421	Phylactella labrosa	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0465	Parasmittina trispinosa	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P	P	-	-	P	-	-	-	P	-	-	-	-	P	P	-
Y0468	Schizomavella auriculata	-	P	-	-	-	-	-	-	P	-	-	-	-	P	P	P	-	P	P	P	-	-	P	P	-	-	-	P	P	-
Y0474	Schizomavella linearis	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	P	-	-
Y0480	Microporella ciliata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	P	-	-	-	-	-	P	-
Y0483	Fenestrulina malusii	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	P	-
Y0485	Diporula verrucosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0502	Lagenipora lepralioides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-
Y0504	Turbicellepora avicularis	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0533	Rhynchozoon bispinosum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
ZA0003	Phoronis	-	-	1	1	2	1	3	P	7	2	2	2	1	-	P	-	-	-	-	1	2	1	5	-	1	P	1	4	-	-
ZA0006	Phoronis ovalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
ZB0018	ASTEROIDEA (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
ZB0100	Asterias rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
ZB0124	Ophiothrix fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0128	Ophiocomina nigra (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0143	Ophiactis balli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	4	-	-	-	-	-	2	-
ZB0143	Ophiactis balli (juv)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae (juv)	-	3	-	6	7	2	1	2	1	-	3	1	1	1	-	-	2	15	4	2	6	4	-	4	-	-	1	-	43	3
ZB0151	Acrocnida brachiata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0154	Amphiura filiformis	-	-	-	1	-	-	3	-	-	-	P	2	2	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
ZB0157	Amphiura securigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0161	Amphipholis squamata	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3	1	-	-	-	3	-	-	4	-	-	3	-
ZB0165	Ophiuridae (juv)	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	6	5	-	-	-	2	-	-	-	2	2	-	2
ZB0168	Ophiura albida	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0167	Ophiocten affinis	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
ZB0190	ECHINOIDA (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0193	Psammechinus miliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
ZB0198	Echinus esculentus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0212	Echinocyamus pusillus	2	4	4	5	15	2	17	7	6	8	3	6	5	10	11	6	9	-	-	11	-	12	2	7	17	6	6	17	13	1
ZB0213	SPATANGOIDA (juv)	-	-	-	-	-	-	5	-	-	-	P	2	1	-	-	P	-	-	-	-	3	1	-	-	-	-	-	-	-	-
ZB0219	Spatangus purpureus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0220	Spatangus raschi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0224	Echinocardium flavescens	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0266	Cucumariidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0280	Leptopentacta elongata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
ZB0291	Leptosynapta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
ZB0294	Leptosynapta decaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0296	Leptosynapta inhaerens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0300	Labidoplax digitata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZC0012	ENTEROPNEUSTA	-	-	-	6	1	7	-	-	-	1	2	-	-	1	-	-	-	-	-	2	3	2	-	-	-	-	-	P	-	P
ZD0002	ASCIDIACEA (juv)	-	-	1	-	-	-	1	-	-	2	-	-	-	2	-	-	-	-	3	-	-	1	-	-	-	-	-	1	-	-
ZD0102	Pelonaia corrugata	-	-	-	2	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0112	Polycarpa fibrosa	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
ZD0120	Dendrodoa grossularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0128	Botrylloides leachi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0149	Molgula complanata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Branchiostoma lanceolatum	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0001	OSTEICHTHYES (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
ZG0086	Diplecogaster bimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0443	Ammotydes tobianus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
ZG0455	Gobiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
	Total No. Species (S)	**29**	**31**	**47**	**46**	**115**	**38**	**73**	**51**	**88**	**38**	**53**	**47**	**49**	**105**	**56**	**52**	**21**	**96**	**114**	**61**	**44**	**44**	**112**	**55**	**37**	**71**	**45**	**117**	**116**	**53**
	Total No. Individuals (A)	**47**	**63**	**121**	**86**	**645**	**75**	**212**	**127**	**258**	**74**	**107**	**110**	**90**	**229**	**105**	**68**	**51**	**660**	**666**	**115**	**104**	**90**	**384**	**103**	**94**	**359**	**92**	**390**	**608**	**74**
	Biomass (g) (B)	**0.1104**	**0.2542**	**0.8608**	**0.2836**	**7.2250**	**0.1901**	**2.1377**	**0.6101**	**0.4206**	**0.1558**	**0.4351**	**0.5085**	**0.2924**	**1.4689**	**0.1459**	**0.0820**	**0.1216**	**1.1440**	**5.1381**	**0.7968**	**0.4433**	**0.2507**	**0.5941**	**0.1397**	**0.1271**	**0.5816**	**0.3238**	**0.7247**	**11.6090**	**0.1620**

Appendix IX
Moray Firth R3 Stevenson, Telford & MacColl :
Results of the macrofaunal analyses
Abundance / 0.1m²
P = present (colonial sessile epifauna)

SDC	TaxonName	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Y0364	Escharella immersa	-	-	-	-	P	-	P	-	-	-	-	P	-	-	P	-	-	-	-	-	P	-	P	-	P	P	-
Y0370	Escharella ventricosa	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
Y0376	Neolagenipora collaris	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0385	Porella concinna	-	-	-	-	P	P	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-
Y0393	Palmiskenea skenei	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0414	Hippoporina pertusa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	P	-
Y0421	Phylactella labrosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Y0465	Parasmittina trispinosa	-	-	-	-	P	P	P	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	-	-	-	P	-
Y0468	Schizomavella auriculata	-	-	-	P	P	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	P	-	P	-	P	P	-
Y0474	Schizomavella linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0480	Microporella ciliata	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Y0483	Fenestrulina malusii	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	P	-
Y0485	Diporula verrucosa	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0502	Lagenipora lepralioides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0504	Turbicellepora avicularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y0533	Rhynchozoon bispinosum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZA0003	Phoronis	-	-	-	-	6	-	-	P	2	3	P	P	-	8	3	10	4	4	2	3	11	7	-	1	1	-	1
ZA0006	Phoronis ovalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-
ZB0018	ASTEROIDEA (juv)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0100	Asterias rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0124	Ophiothrix fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0128	Ophiocomina nigra (juv)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0143	Ophiactis balli	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0143	Ophiactis balli (juv)	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0148	Amphiuridae (juv)	-	2	-	-	4	5	6	2	1	2	3	2	23	3	2	P	2	5	-	3	2	1	-	P	1	-	-
ZB0151	Acrocnida brachiata	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0154	Amphiura filiformis	-	-	-	-	-	-	-	-	-	1	1	-	-	1	1	-	-	2	-	1	-	-	-	-	-	-	P
ZB0157	Amphiura securigera	-	-	-	-	-	-	-	-	P	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
ZB0161	Amphipholis squamata	-	-	-	-	3	6	4	-	-	-	-	-	8	-	-	-	-	-	1	-	-	-	-	-	-	-	-
ZB0165	Ophiuridae (juv)	-	-	-	-	4	-	-	-	-	-	-	-	-	1	P	-	1	-	-	-	1	1	-	-	-	-	-
ZB0168	Ophiura albida	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0167	Ophiocten affinis	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	2	-	1	-	-
ZB0190	ECHINOIDA (juv)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0193	Psammechinus miliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0198	Echinus esculentus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0212	Echinocyamus pusillus	4	12	28	8	4	15	14	15	14	26	7	13	-	27	24	2	12	7	-	12	10	8	-	1	1	1	12
ZB0213	SPATANGOIDA (juv)	-	1	-	-	1	P	-	2	-	-	2	3	-	7	-	1	-	5	-	3	-	2	-	-	-	-	-
ZB0219	Spatangus purpureus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
ZB0220	Spatangus raschi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0224	Echinocardium flavescens	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0266	Cucumariidae (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0280	Leptopentacta elongata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0291	Leptosynapta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0294	Leptosynapta decaria	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0296	Leptosynapta inhaerens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZB0300	Labidoplax digitata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
ZC0012	ENTEROPNEUSTA	-	1	-	-	-	-	-	-	-	4	2	16	-	1	-	2	-	11	1	4	-	6	-	-	-	-	-
ZD0002	ASCIDIACEA (juv)	-	-	-	-	7	1	-	-	-	3	-	-	-	1	-	-	2	-	-	-	2	-	-	-	-	-	-
ZD0102	Pelonaia corrugata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0112	Polycarpa fibrosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0120	Dendrodoa grossularia	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0128	Botrylloides leachi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZD0149	Molgula complanata	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Branchiostoma lanceolatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
ZG0001	OSTEICHTHYES (juv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG0086	Diplecogaster bimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
ZG0443	Ammotydes tobianus	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
ZG0455	Gobiidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
	Total No. Species (S)	**36**	**38**	**37**	**34**	**136**	**108**	**94**	**52**	**74**	**52**	**58**	**51**	**62**	**51**	**130**	**41**	**100**	**52**	**40**	**55**	**79**	**51**	**24**	**27**	**64**	**43**	**33**
	Total No. Individuals (A)	**80**	**102**	**144**	**62**	**632**	**587**	**380**	**132**	**324**	**148**	**125**	**111**	**427**	**131**	**907**	**84**	**880**	**114**	**87**	**111**	**440**	**100**	**26**	**30**	**254**	**93**	**73**
	Biomass (g) (B)	**0.1728**	**0.2715**	**0.2902**	**0.9313**	**0.7632**	**1.2547**	**9.1265**	**0.7592**	**1.3277**	**0.5696**	**0.2407**	**0.8080**	**7.2392**	**0.2364**	**4.3122**	**0.2852**	**8.8356**	**0.5966**	**0.4551**	**0.5808**	**0.3670**	**0.8036**	**0.0222**	**0.0643**	**0.9420**	**0.4924**	**0.0886**

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Appendix X Results of the biomass analysis

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Appendix X
Moray Firth R3 Stevenson, Telford & MacColl sites. Benthic ecological characterisation
Results of the biomass analyses
Grams wet weight. Ricciardi & Bourget conversions for direct comparison with Beatrice data

Biomass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Other taxa	0,0119	0,0364	0,0266	0,0091	0,0066	0,0037	0,0674	0,0079	0,0149	0,0135	0,0292	0,0487	0,0063	0,0009	0,0228	0,0002
Crustaceans	0,0008	0,0004	0,0035	0,0030	0,0009	0,0005	0,0046	0,0038	0,0036	0,0019	0,0010	0,0201	0,0019	0,0077	0,0021	0,0006
Echinoderms	0,0059	0,0214	0,0073	0,0659	0,0013	0,0017	0,0208	0,0006	0,0031	0,0003	0,0028	2,5179	0,0106	0,0004	0,0117	0,0033
Molluscs	0,0384	0,1924	0,1737	0,1658	0,0032	0,1526	0,1042	0,0405	0,0916	0,0406	0,2196	0,0470	0,1671	0,0194	0,1037	0,0230
Oligochaetes								0,0000								
Polychaetes	0,1305	0,0887	0,1053	0,4962	0,4494	0,3676	0,2673	0,1060	0,0631	0,0639	0,0483	0,2476	0,2156	0,0494	0,2896	0,1031
TOTAL	**0,1875**	**0,3393**	**0,3164**	**0,7401**	**0,4615**	**0,5261**	**0,4642**	**0,1587**	**0,1763**	**0,1201**	**0,3008**	**2,8814**	**0,4015**	**0,0778**	**0,4298**	**0,1302**

Biomass	17	18	19	21	22	23	24	25	26	27	28	29	30	31	32	33
Other taxa	0,0013	0,0065	0,0103	0,0364	0,0134	0,0122	0,0053	0,0081	0,1376	0,0648	0,0497	0,0067	0,0006	0,0016	0,0006	-
Crustaceans	0,0010	0,0023	0,0090	0,0924	1,0547	0,0031	0,0002	0,0021	0,0015	0,1446	0,0068	0,0059	0,0015	0,0003	0,0011	0,0051
Echinoderms	0,1461	0,0297	0,0003	6,2358	0,0014	0,0955	0,0019	0,0017	0,0040	0,0352	0,0068	0,0089	0,0165	0,0013	0,0123	0,0010
Molluscs	0,0276	0,3045	0,0075	0,0382	0,0308	0,3345	0,1942	0,1185	0,3978	0,8334	0,0797	0,3465	0,6612	0,1416	0,0546	0,1998
Oligochaetes			0,0003													
Polychaetes	0,1161	0,1808	0,0486	0,1386	0,1869	0,0412	0,0452	0,0284	0,0673	0,5869	0,2625	0,1082	0,1008	0,0650	0,0417	0,0482
TOTAL	**0,2921**	**0,5237**	**0,0758**	**6,5414**	**1,2873**	**0,4864**	**0,2469**	**0,1588**	**0,6082**	**1,6649**	**0,4054**	**0,4761**	**0,7806**	**0,2097**	**0,1104**	**0,2542**

Biomass	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Other taxa	0,0124	0,1333	0,0286	0,0402	0,0055	0,0651	0,0405	0,0291	0,1360	0,0322	0,0097	0,0337	0,0180	0,0060	0,0090	0,0242
Crustaceans	0,0035	0,0010	0,0779	0,0022	0,0023	0,0083	0,0119	0,0010	0,0038	0,0022	0,0011	0,0244	0,0012	0,0006	0,0040	0,4767
Echinoderms	0,0023	0,0038	0,0063	0,0001	0,0154	0,0010	0,0023	0,0012	0,0029	0,0107	0,0134	0,0053	0,0039	0,0097	0,0038	0,0451
Molluscs	0,6958	0,0493	6,6070	0,0806	1,9085	0,2456	0,0883	0,0428	0,1030	0,3465	0,1111	0,5384	0,0519	0,0211	0,0475	0,1268
Oligochaetes			0,0003									0,0000	0,0000			
Polychaetes	0,1468	0,0961	0,5051	0,0671	0,2060	0,2901	0,2776	0,0817	0,1895	0,1170	0,1570	0,8670	0,0708	0,0446	0,0572	0,4712
TOTAL	**0,8608**	**0,2836**	**7,2250**	**0,1901**	**2,1377**	**0,6101**	**0,4206**	**0,1558**	**0,4351**	**0,5085**	**0,2924**	**1,4689**	**0,1459**	**0,0820**	**0,1216**	**1,1440**

Appendix X
Moray Firth R3 Offshore Wind Farm (Eastern Phase)
Results of the biomass analyses
Grams wet weight. Ricciardi & Bourget conversions for direct comparison with Beatrice data

Biomass	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Other taxa	0,0119	0,0231	0,0178	0,0136	0,0993	0,0030	0,0119	0,1941	0,1051	0,0737	0,0633	0,0267	0,0148	0,0516	0,0016	0,0001
Crustaceans	0,4235	0,0018	0,0021	0,0007	0,0238	0,0044	0,0008	0,0056	0,0024	0,1562	0,0055	0,0010	0,0007	0,0034	0,0010	0,0035
Echinoderms	0,0018	0,0015	0,1784	0,0031	0,0133	0,0014	0,0015	0,0116	0,0019	0,0112	0,0161	0,0016	0,0018	0,0054	0,0066	0,0021
Molluscs	4,1875	0,4944	0,1917	0,1786	0,1628	0,0826	0,0007	0,1176	0,1862	0,1885	11,3144	0,0717	0,0413	0,1210	0,2299	0,8587
Oligochaetes					0,0000						0,0000					
Polychaetes	0,5134	0,2760	0,0533	0,0546	0,2949	0,0482	0,1122	0,2527	0,0281	0,2951	0,2096	0,0609	0,1142	0,0901	0,0511	0,0669
TOTAL	**5,1381**	**0,7968**	**0,4433**	**0,2507**	**0,5941**	**0,1397**	**0,1271**	**0,5816**	**0,3238**	**0,7247**	**11,6090**	**0,1620**	**0,1728**	**0,2715**	**0,2902**	**0,9313**

Biomass	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
Other taxa	0,0441	0,1202	0,0327	0,0096	0,0163	0,0230	0,0398	0,5098	0,0021	0,0285	0,1359	0,1507	0,0778	0,0652	0,0486	0,2238
Crustaceans	0,0463	0,0107	0,0107	0,0067	0,0255	0,0006	0,0005	0,0028	0,0048	0,0014	0,0579	0,0080	0,0344	0,0134	0,0008	0,0035
Echinoderms	0,0059	0,0025	0,0068	0,0017	0,0220	0,0077	0,0075	0,0013	0,0047	0,0086	0,0186	0,0002	2,5515	0,0117	0,0010	0,0064
Molluscs	0,1259	0,6324	8,8085	0,6267	0,8017	0,3910	0,0337	0,0582	6,7067	0,1653	3,4930	0,0191	5,6965	0,4562	0,2980	0,2359
Oligochaetes	0,0000	0,0001	0,0002		0,0000				0,0003		0,0000		0,0000			
Polychaetes	0,5410	0,4889	0,2676	0,1146	0,4624	0,1474	0,1593	0,2359	0,5206	0,0326	0,6067	0,1073	0,4755	0,0502	0,1067	0,1111
TOTAL	**0,7632**	**1,2547**	**9,1265**	**0,7592**	**1,3277**	**0,5696**	**0,2407**	**0,8080**	**7,2392**	**0,2364**	**4,3122**	**0,2852**	**8,8356**	**0,5966**	**0,4551**	**0,5808**

Biomass	82	83	84	85	86	87	88
Other taxa	0,1191	0,1224	0,0020	0,0095	0,0272	0,0058	0,0005
Crustaceans	0,0101	0,0035	0,0040	0,0014	0,0000	0,0017	0,0042
Echinoderms	0,0018	0,0010	0,0009	0,0002	0,0005	0,0001	0,0044
Molluscs	0,0703	0,0254	0,0021	0,0109	0,8000	0,3953	0,0332
Oligochaetes					0,0000		
Polychaetes	0,1657	0,6513	0,0132	0,0422	0,1142	0,0895	0,0463
TOTAL	**0,3670**	**0,8036**	**0,0222**	**0,0643**	**0,9420**	**0,4924**	**0,0886**

Appendix XI Trawl sample species list

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Appendix XI
Moray R3 Stevenson, Telford & MacColl. Benthic ecology characterisation
Trawl sample species list
p = present

Taxon	MCS Code	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Suberites (=ficus spp. agg.?)	C0414	P	P	P	P	P	0	P	P	P	0	P
Suberites sp.	C0414	0	0	0	0	0	0	0	0	0	0	0
Cliona spp. (agg.)	C0475	0	0	0	0	0	0	0	0	0	0	0
Hymedesmiidae	C0918	0	0	0	0	0	0	0	0	0	0	0
Tubularia bellis	D0164	P	0	0	0	0	0	0	0	0	0	0
Tubularia indivisa	D0166	0	0	0	0	P	0	0	0	0	0	0
Eudendrium sp.	D0218	0	0	P	P	P	0	0	0	0	0	0
Bougainvilliidae	D0246	0	0	0	0	0	0	0	P	P	0	P
Hydractinia echinata	D0273	0	0	0	0	0	0	0	P	0	0	0
Campanulinidae	D0344	0	0	0	0	0	0	0	P	0	0	P
Lafoeidae	D0380	0	0	0	0	0	0	0	P	0	0	0
Lafoea dumosa	D0386	0	0	0	0	0	0	0	0	P	0	0
Halecium sp.	D0390	P	0	0	P	0	P	P	P	0	0	0
Halecium beanii	D0391	0	0	0	0	0	0	0	0	0	P	P
Halecium halecinum	D0392	0	0	0	0	P	P	0	P	0	0	0
Halecium muricatum	D0395	0	0	P	0	P	0	P	0	P	0	0
Abietinaria abietina	D0409	P	0	P	P	P	P	P	P	P	P	0
Hydrallmania falcata	D0424	P	P	P	P	P	P	P	P	P	P	P
Sertularella spp.	D0427	0	0	0	0	0	0	0	0	0	0	0
Sertularella polyzonias	D0430	P	0	P	P	0	0	P	P	0	0	P
Sertularella tenella	D0432	0	0	0	0	P	0	P	0	0	0	0
Sertularia sp.	D0433	0	P	P	0	P	0	0	P	P	0	P
Sertularia argentea	D0434	0	0	0	0	0	0	P	0	0	0	0
Tamarisca tamarisca	D0440	0	0	P	0	P	0	0	0	P	0	0
Thuiaria thuja	D0443	0	0	P	0	P	0	0	0	0	P	0
Antennella secundaria	D0450	0	0	0	0	0	0	0	0	0	0	0
Kirchenpaueria pinnata	D0455	0	0	P	P	0	0	0	P	P	0	0
Nemertesia sp.	D0462	P	P	P	P	P	0	P	P	P	0	P
Nemertesia antennina	D0463	P	P	0	P	0	0	0	P	0	0	0
Nemertesia ramosa	D0466	P	P	P	P	P	0	P	P	P	0	0
Plumularia setacea	D0469	0	0	0	0	0	0	0	0	0	0	P
Rhizocaulus verticillatus	D0499	0	0	0	0	0	0	P	0	P	0	0
Clytia spp.	D0501	0	0	0	0	0	0	0	P	0	0	0
Clytia hemisphaerica	D0503	P	0	0	0	0	P	0	0	0	0	0
Obelia spp.	D0517	0	0	0	0	0	0	P	P	P	0	0
Obelia dichotoma	D0519	0	0	0	0	0	P	0	P	P	0	0
Alcyonium digitatum	D0597	0	0	P	25g	0	0	10g	25g	125g	200g	0
Alcyonium glomeratum	D0598	0	0	0	0	0	0	0	0	0	0	0
Pennatula phosphorea	D0623	0	0	0	0	0	0	0	0	0	0	0
ACTINIARIA	D0662	0	0	0	0	0	0	0	0	0	0	2
Metridium senile	D0710	0	0	0	0	1	9	0	0	1	0	0
Adamsia carciniopados	D0743	13	4	9	22	53	0	4	3	1	2	2
Pedicellina spp.	K0045	0	0	P	0	0	0	0	P	P	0	0
Aphrodita aculeata	P0019	0	0	0	0	0	0	0	0	0	0	1
Alentia gelatinosa	P0034	0	0	0	0	1	0	0	0	0	1	0
Nephtys assimilis	P0495	0	0	0	0	0	0	0	0	0	0	0
Hyalinoecia tubicola	P0542	13	24	10	19	17	10	3	22	11	0	41
Sabellaria sp. tube	P1115	0	0	0	0	0	0	0	0	0	0	0

Taxon	MCS Code	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Pomatoceros spp.	P1339	0	0	0	0	0	0	0	0	0	0	0
CIRRIPEDIA sp. (juv.)	R0014	0	0	0	0	0	0	0	10	0	0	0
Scalpellum scalpellum	R0022	0	0	0	0	0	2	0	4	14	0	19
Verruca stroemia	R0041	0	0	0	0	0	0	0	2	20	0	2
Balanus crenatus	R0077	2	0	0	0	0	1	10	41	9	0	0
Ericthonius tube mass	S0561	0	0	0	0	0	0	0	0	0	0	0
CARIDEA	S1293	0	0	0	0	0	0	0	0	0	0	0
Processa sp.	S1362	0	9	0	0	0	0	0	0	16	5	6
Processa canaliculata	S1363	0	8	0	0	0	0	0	0	18	22	16
Pandalidae	S1370	0	0	0	0	0	0	0	0	0	0	0
Pandalina brevirostris	S1374	0	0	0	0	0	0	0	0	0	0	0
Pandalina brevirostris (SubSampled)	S1374	0	0	0	0	0	0	0	0	0	0	0
Pandalus sp.	S1375	0	0	0	0	0	0	0	0	0	1	0
Pandalus montagui	S1377	0	0	0	0	0	0	0	0	0	12	0
Crangon allmanni	S1384	2	0	0	0	0	0	0	0	1	0	1
Philocheras sculptus	S1389	0	0	0	0	0	0	0	0	0	0	0
Pontophilus spinosus	S1393	0	0	0	0	0	0	0	0	0	0	0
Paguridae	S1445	0	0	0	0	0	0	0	3	1	0	1
Anapagurus laevis	S1449	0	0	0	0	0	0	0	0	0	0	1
Pagurus bernhardus	S1457	6	1	9	6	4	3	3	1	1	0	6
Pagurus cuanensis	S1460	0	0	0	0	0	0	0	1	0	0	0
Pagarus prideaux	S1462	13	4	9	22	52	0	5	4	1	2	2
Galathea dispersa	S1471	4	0	0	0	0	0	0	1	0	3	0
Galathea intermedia	S1472	0	0	0	0	0	0	0	0	0	0	0
Galathea nexa	S1474	0	0	0	0	0	0	0	0	0	0	0
Munida rugosa	S1478	0	0	0	0	0	1	1	0	0	19	0
Macropodia parva/rostrata	S15??/S1532	9	1	5	6	11	0	16	2	1	5	3
Ebalia tuberosa	S1508	0	0	3	0	0	0	0	1	0	2	0
Hyas coarctatus	S1519	2	0	0	1	3	0	5	2	0	1	0
Inachus sp.	S1525	0	0	0	0	0	0	0	0	0	0	0
Inachus dorsettensis	S1526	2	0	4	0	5	0	3	0	0	1	0
Macropodia tenuirostris	S1533	2	1	2	1	13	2	6	17	17	5	4
Eurynome sp.	S1535	0	0	1	0	0	0	0	0	0	1	0
Atelecyclus rotundatus	S1555	2	1	0	2	1	0	1	0	1	0	0
Cancer pagurus	S1566	0	0	0	0	0	0	0	0	0	2	1
Cancer pagurus (female)	S1566	0	0	0	0	0	0	0	0	0	0	0
Liocarcinus depurator	S1580	5	0	1	0	5	6	7	15	40	9	20
Liocarcinus holsatus	S1581	1	11	0	0	0	3	1	4	6	0	2
Liocarcinus pusillus	S1584	0	0	0	0	0	0	0	0	0	0	0
Monodaeus couchi	S1609	0	0	0	0	0	0	0	0	0	0	0
Pecten maximus	W01771	0	0	0	1	0	0	0	1	0	0	0
Calliostoma zizyphinum	W0182	0	0	1	0	0	0	0	0	1	2	0
Buccinum undatum	W0708	2	0	1	1	1	1	0	2	0	1	1
Colus gracilis	W0715	1	0	0	1	1	0	0	0	0	0	0
Neptunea antiqua	W0727	0	0	1	0	0	0	0	0	0	1	0
Archidoris pseudoargus	W1376	0	0	0	0	2	0	2	0	0	0	0
Glycymeris glycymeris	W1688	0	0	0	0	0	0	0	0	0	0	0
Modiolus modiolus	W1702	0	0	0	0	0	0	0	0	0	1	0
Aequipecten opercularis	W1773	4	6	6	11	17	4	34	15	2	59	8
Palliolum tigerinum	W1786	1	0	0	0	1	0	0	0	0	0	0
Heteranomia squamula	W1809	0	0	0	0	0	0	0	0	4	0	0
Pododesmus patelliformis	W1814	0	0	0	0	0	0	0	0	0	0	0
Laevicardium crassum	W1959	0	0	0	0	0	0	0	0	0	0	0

Taxon	MCS Code	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Spisula elliptica	W1975	0	0	0	0	0	0	0	0	0	0	0
Ensis arcuatus	W1998	0	0	0	0	0	0	0	0	0	0	0
Gari tellinella	W2049	0	0	0	0	0	0	0	0	0	0	0
Venus fasciata	W2100	0	0	0	0	0	0	0	0	0	0	0
Sepiola atlantica	W2329	0	0	0	2	3	0	0	2	0	0	0
Crisia spp.	Y0013	0	0	0	0	0	0	0	0	0	0	0
Crisia eburnea	Y0017	P	0	0	0	0	0	0	0	0	0	0
Tubuliporidae	Y0026	0	0	0	0	0	0	0	0	0	0	0
Diastoporidae	Y0037	0	0	0	0	0	0	0	0	0	0	0
Eurystrotos compacta	Y0039	0	0	0	0	0	0	0	0	0	0	0
Diplosolen obelia	Y0044	0	0	0	0	0	0	0	0	0	0	0
Entalophoroecia deflexa	Y0054	0	0	0	0	0	0	0	0	0	0	0
Disporella hispida	Y0066	0	0	0	0	0	0	0	0	0	0	0
Alcyonidium sp.	Y0073	0	0	0	0	0	0	0	0	0	0	P
Alcyonidium diaphanum	Y0076	10g	P	>10g	0	0	0	10g	0	25g	0	27g
Alcyonidium mytili	Y0080	0	0	0	0	0	0	P	P	0	0	0
Alcyonidium parasiticum	Y0081	P	0	P	P	P	0	P	P	P	0	P
Vesicularia spinosa	Y0131	0	0	0	0	0	0	0	P	0	0	0
Eucratea loricata	Y0165	P	P	P	P	P	0	P	P	P	0	P
Electra pilosa	Y0178	0	0	0	0	0	0	0	0	P	0	P
Pyripora catenularia	Y0180	0	0	0	0	0	0	0	0	0	0	P
Flustra foliacea	Y0187	556g	175g	375g	300g	375g	125g	P	P	175g	375g	225g
Chartella barleei	Y0191	P	0	P	P	P	0	0	P	P	0	P
Callopora craticula	Y0202	0	0	0	0	0	0	0	0	0	0	0
Callopora dumerilii	Y0204	0	0	0	0	0	0	0	0	P	0	0
Tegella unicornis	Y0214	0	0	0	0	0	0	0	0	P	0	0
Bugula avicularia	Y0241	0	0	0	0	0	0	0	0	0	0	0
Scrupocellaria scruposa	Y0279	0	0	P	0	0	0	0	0	0	0	0
Cribrilina punctata	Y0310	0	0	0	0	0	0	0	P	P	0	P
Hippothoa divaricata	Y0332	0	0	0	0	0	0	0	0	0	0	0
Escharella immersa	Y0364	0	0	0	0	0	0	0	0	0	0	0
Escharella ventricosa	Y0370	0	0	0	0	0	0	0	0	0	0	0
Porella concinna	Y0385	0	0	0	0	0	0	0	0	0	0	0
Hippoporina pertusa	Y0414	0	0	0	0	0	0	0	0	0	0	0
Parasmittina trispinosa	Y0465	0	0	0	0	0	0	0	0	0	0	P
Schizomavella auriculata	Y0468	0	0	0	0	0	0	0	0	0	0	0
Schizomavella linearis	Y0474	0	0	0	0	0	0	0	0	0	0	0
Microporella ciliata	Y0480	0	0	0	0	0	0	0	0	0	0	0
Luidia ciliaris	ZB0022	0	0	0	1	0	0	0	0	0	0	0
Luidia sarsi	ZB0023	0	0	1	0	1	0	0	0	0	0	0
Astropecten irregularis	ZB0026	1	1	1	3	1	3	1	0	0	2	0
Anseropoda placenta	ZB0062	0	0	0	0	0	0	0	0	0	0	0
Crossaster papposus	ZB0075	0	1	0	1	0	0	2	0	0	0	0
Henricia sp.	ZB0082	0	0	0	0	0	0	0	0	0	0	0
Henricia sp. (juv.)	ZB0082	0	0	0	0	0	0	0	0	0	0	0
Henricia oculata	ZB0083	0	0	0	0	0	0	0	0	0	0	0
Asteriidae (juv.)	ZB0096	0	0	0	0	0	0	0	0	0	0	0
Asterias rubens	ZB0100	22	15	18	69	14	47	96	5	0	111	1
Ophiothrix fragilis	ZB0124	0	0	0	0	1	0	1	0	0	4	0
Ophiactis balli	ZB0143	0	0	0	0	0	0	0	0	0	0	0
Ophiura albida	ZB0168	0	0	0	0	0	0	0	0	0	0	0
Ophiura ophiura	ZB0170	1	0	1	1	8	0	1	6	0	0	0
ECHINOIDEA (juv.)	ZB0181	0	0	0	0	0	0	0	0	0	0	0
Psammechinus miliaris	ZB0193	3	1	2	0	8	0	5	0	1	2	0
Echinus sp.	ZB0195	0	0	0	5	0	0	4	1	0	0	1
Echinus esculentus	ZB0198	2	0	4	4	9	0	1	0	0	36	0

Taxon	MCS Code	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Spatangus sp.	ZB0218	0	0	0	0	0	0	0	0	0	0	0
Spatangus purpureus	ZB0219	0	0	0	0	0	0	0	0	0	0	0
Echinocardium sp.	ZB0222	0	0	0	0	0	0	0	0	0	0	0
Ciona intestinalis	ZD0071	0	0	0	0	0	0	0	0	0	0	0
Ascidiella spp.	ZD0083	0	0	0	0	0	0	0	0	2	0	0
Ascidiella scabra	ZD0085	0	0	1	0	0	0	15	3	2	0	0
Ascidia conchilega	ZD0088	0	0	0	0	0	0	1	0	0	0	0
Pelonaia corrugata	ZD0102	0	0	0	0	0	0	0	0	1	0	0
Styela clava	ZD0104	0	1	0	0	0	0	0	0	0	0	0
Polycarpa pomaria	ZD0115	0	0	0	0	0	0	0	0	0	0	0
Botryllus schlosseri	ZD0126	0	0	0	0	0	0	0	0	0	0	0
Botrylloides leachi	ZD0128	0	0	0	0	0	0	0	P	P	0	0
Leucoraja naevus	ZF0095	0	1	0	0	1	0	0	0	0	0	1
Lotinae (juv.)	ZG0???	0	0	0	0	0	0	0	0	0	0	0
OSTEICHTHYES (=?Gobiidae)	ZG0001	0	0	0	0	0	0	0	0	0	0	0
Argentina sphyraena	ZG0058	0	0	0	0	0	0	0	0	0	0	1
Lophius piscatorius	ZG0094	0	0	0	0	0	0	0	0	0	0	0
Ciliata septentrionalis	ZG0112	0	0	0	0	0	0	0	0	0	1	0
Gadus morhua	ZG0116	0	0	0	1	0	0	0	0	0	2	0
Melanogrammus aeglefinus	ZG0121	0	0	0	0	0	0	0	0	1	2	0
Merlangius merlangus	ZG0123	0	1	0	0	0	0	0	0	0	0	0
Molva molva	ZG0129	0	0	0	0	0	0	0	0	0	0	0
Trisopterus minutus	ZG0144	0	0	0	0	0	0	0	0	0	0	3
Zeus faber	ZG0209	0	0	2	0	1	0	0	0	0	0	0
Entelurus aequoraeus	ZG0237	1	0	2	1	0	0	0	0	0	0	0
Taurulus bubalis	ZG0238	0	0	0	0	2	0	1	0	0	4	0
Aspitrigla cuculus	ZG0262	0	0	0	0	1	0	0	0	0	2	0
Eutrigla gurnardus	ZG0265	0	4	0	0	0	1	0	2	5	0	3
Myoxocephalus scorpius	ZG0281	0	0	0	0	0	0	0	0	0	0	0
Agonus cataphractus	ZG0291	2	3	3	1	1	0	3	3	10	3	2
Blenniidae	ZG0406	0	0	0	0	0	0	0	0	0	1	0
Chirolophis ascanni	ZG0425	0	0	0	0	0	0	0	0	0	0	0
Pholis gunnellus	ZG0440	0	0	0	0	0	0	0	0	0	0	0
Ammodytes sp.	ZG0442	0	0	0	0	0	0	0	0	2	2	1
Gymnammodytes semisquamatus	ZG0446	0	0	0	0	0	0	0	0	0	0	0
Hyperoplus lanceolatus	ZG0449	0	0	0	0	0	0	0	0	0	0	0
Callionymus lyra	ZG0452	1	3	0	0	1	1	0	7	6	4	3
Gobiidae	ZG0455	0	0	2	0	1	0	1	2	0	1	0
Phrynorhombus sp.	ZG0550	0	0	0	0	0	0	0	0	0	0	0
Phrynorhombus norvegicus	ZG0551	0	0	0	1	0	0	2	0	0	4	0
Arnoglossus laterna	ZG0562	1	0	0	0	0	2	1	0	2	0	3
Limanda limanda	ZG0572	12	18	22	11	1	26	6	0	0	38	7
Microstomus kitt	ZG0574	0	2	1	1	2	0	2	1	0	4	1
Pleuronectes platessa	ZG0578	10	25	8	5	0	0	4	0	2	5	3
Buglossidium luteum	ZG0585	0	0	0	0	0	1	0	0	0	0	0
Microchirus variegatus	ZG0588	2	7	1	2	1	1	0	3	11	5	13

Appendix XI
Moray R3 eastern phase benthic ecology characterisation
Trawl sample species list
p = present

Taxon	MCS Code	T14	T15	T16	T17	T18	T19	T20	T21
Suberites (=ficus spp. agg.?)	C0414	0	0	P	0	0	0	0	0
Suberites sp.	C0414	0	0	0	0	P	P	0	0
Cliona spp. (agg.)	C0475	0	0	0	P	0	0	0	0
Hymedesmiidae	C0918	0	0	P	0	0	0	0	0
Tubularia bellis	D0164	0	0	0	0	0	0	0	0
Tubularia indivisa	D0166	0	0	0	0	0	0	0	0
Eudendrium sp.	D0218	0	0	0	0	0	0	0	0
Bougainvilliidae	D0246	0	0	0	P	0	0	0	P
Hydractinia echinata	D0273	0	0	0	0	0	0	0	0
Campanulinidae	D0344	0	0	0	0	0	0	0	0
Lafoeidae	D0380	0	0	0	0	0	0	0	0
Lafoea dumosa	D0386	0	0	P	0	0	0	0	0
Halecium sp.	D0390	0	P	P	P	P	0	0	P
Halecium beanii	D0391	0	0	0	P	0	0	0	0
Halecium halecinum	D0392	0	P	0	0	0	0	0	0
Halecium muricatum	D0395	0	0	P	P	P	0	0	0
Abietinaria abietina	D0409	P	P	P	P	P	P	P	P
Hydrallmania falcata	D0424	P	P	P	P	P	P	P	P
Sertularella spp.	D0427	0	0	0	P	0	P	0	0
Sertularella polyzonias	D0430	P	0	P	P	P	0	P	0
Sertularella tenella	D0432	0	0	P	P	P	0	0	0
Sertularia sp.	D0433	0	P	P	P	P	P	0	0
Sertularia argentea	D0434	0	0	0	0	0	P	0	0
Tamarisca tamarisca	D0440	0	0	0	P	0	0	0	0
Thuiaria thuja	D0443	0	P	0	P	P	0	0	0
Antennella secundaria	D0450	0	P	0	P	P	0	0	0
Kirchenpaueria pinnata	D0455	0	0	P	P	0	0	0	0
Nemertesia sp.	D0462	P	0	P	P	0	0	0	P
Nemertesia antennina	D0463	0	0	0	P	P	0	0	0
Nemertesia ramosa	D0466	0	P	P	P	P	P	0	0
Plumularia setacea	D0469	0	0	0	0	0	0	0	0
Rhizocaulus verticillatus	D0499	P	0	0	P	0	0	0	0
Clytia spp.	D0501	0	0	0	P	0	0	0	0
Clytia hemisphaerica	D0503	0	0	0	0	0	0	0	0
Obelia spp.	D0517	0	P	P	0	0	0	0	0
Obelia dichotoma	D0519	0	0	0	P	0	0	0	0
Alcyonium digitatum	D0597	0	25g	0	75g	175g	0	75g	25g
Alcyonium glomeratum	D0598	0	0	P	0	0	0	0	0
Pennatula phosphorea	D0623	0	0	0	0	0	0	0	0
ACTINIARIA	D0662	0	0	0	0	0	0	0	0
Metridium senile	D0710	0	0	0	0	0	0	0	0
Adamsia carciniopados	D0743	0	0	0	11	1	41	2	0
Pedicellina spp.	K0045	0	0	0	0	0	0	0	0
Aphrodita aculeata	P0019	0	0	1	0	0	0	0	0
Alentia gelatinosa	P0034	0	1	0	0	0	0	0	0
Nephtys assimilis	P0495	0	0	0	0	0	1	0	0
Hyalinoecia tubicola	P0542	0	0	9	4	5	0	0	0
Sabellaria sp. tube	P1115	0	0	0	0	1	0	0	0

Taxon	MCS Code	T14	T15	T16	T17	T18	T19	T20	T21
Pomatoceros spp.	P1339	0	0	0	0	0	0	0	0
CIRRIPEDIA sp. (juv.)	R0014	0	0	0	0	0	0	0	0
Scalpellum scalpellum	R0022	0	0	8	0	3	0	0	0
Verruca stroemia	R0041	0	0	0	2	0	0	0	0
Balanus crenatus	R0077	9	0	0	84	14	0	0	0
Ericthonius tube mass	S0561	P	P	0	P	0	0	0	0
CARIDEA	S1293	0	0	0	0	0	0	0	0
Processa sp.	S1362	4	1	0	0	0	2	0	27
Processa canaliculata	S1363	17	0	0	0	0	5	0	34
Pandalidae	S1370	0	20	0	0	0	0	0	0
Pandalina brevirostris	S1374	0	6	0	0	0	0	0	0
Pandalina brevirostris (SubSampled)	S1374	0	0	0	0	0	0	0	0
Pandalus sp.	S1375	0	2	0	0	0	0	0	0
Pandalus montagui	S1377	3	80	0	1	0	0	0	2
Crangon allmanni	S1384	1	0	0	0	0	2	0	2
Philocheras sculptus	S1389	0	2	0	4	0	0	0	0
Pontophilus spinosus	S1393	1	0	0	1	0	0	0	2
Paguridae	S1445	0	0	0	0	0	0	0	0
Anapagurus laevis	S1449	0	0	0	0	0	1	0	0
Pagurus bernhardus	S1457	3	2	2	6	1	6	4	4
Pagurus cuanensis	S1460	0	0	0	1	1	0	0	0
Pagarus prideaux	S1462	0	0	0	22	1	41	2	0
Galathea dispersa	S1471	1	1	1	3	1	1	0	0
Galathea intermedia	S1472	0	0	0	0	0	0	0	0
Galathea nexa	S1474	0	5	0	0	0	0	0	1
Munida rugosa	S1478	11	12	0	1	0	0	0	1
Macropodia parva/rostrata	S15??/S1532	2	3	1	8	0	3	0	1
Ebalia tuberosa	S1508	0	0	0	1	0	2	0	0
Hyas coarctatus	S1519	1	2	1	2	1	3	0	1
Inachus sp.	S1525	1	0	0	0	0	0	0	0
Inachus dorsettensis	S1526	5	0	0	5	0	2	0	0
Macropodia tenuirostris	S1533	3	1	10	13	2	1	0	1
Eurynome sp.	S1535	0	0	0	0	0	0	0	0
Atelecyclus rotundatus	S1555	0	0	0	16	0	0	0	0
Cancer pagurus	S1566	2	0	0	0	0	0	0	0
Cancer pagurus (female)	S1566	0	0	0	0	0	0	0	0
Liocarcinus depurator	S1580	86	13	33	58	41	3	7	48
Liocarcinus holsatus	S1581	0	0	1	0	0	4	1	1
Liocarcinus pusillus	S1584	0	0	0	1	0	0	0	2
Monodaeus couchi	S1609	0	2	0	0	0	0	0	1
Pecten maximus	W01771	0	1	0	0	0	0	0	0
Calliostoma zizyphinum	W0182	0	1	0	0	0	0	0	0
Buccinum undatum	W0708	1	0	0	1	0	1	1	2
Colus gracilis	W0715	0	0	0	0	0	0	0	0
Neptunea antiqua	W0727	0	0	0	0	0	0	0	0
Archidoris pseudoargus	W1376	0	1	0	1	0	1	0	0
Glycymeris glycymeris	W1688	1	0	0	1	0	2	0	0
Modiolus modiolus	W1702	0	0	0	0	0	0	0	0
Aequipecten opercularis	W1773	28	6	8	62	9	23	3	7
Palliolum tigerinum	W1786	0	0	0	0	0	0	0	0
Heteranomia squamula	W1809	0	0	0	0	1	0	0	0
Pododesmus patelliformis	W1814	0	1	0	0	0	0	0	0
Laevicardium crassum	W1959	0	0	0	0	0	1	0	0

Taxon	MCS Code	T14	T15	T16	T17	T18	T19	T20	T21
Spisula elliptica	W1975	0	0	0	0	0	3	0	0
Ensis arcuatus	W1998	0	0	0	0	0	1	0	0
Gari tellinella	W2049	0	0	0	0	0	2	0	0
Venus fasciata	W2100	1	0	0	0	0	0	0	0
Sepiola atlantica	W2329	1	0	4	0	2	0	2	0
Crisia spp.	Y0013	0	0	0	0	0	0	0	0
Crisia eburnea	Y0017	0	0	0	0	0	0	0	0
Tubuliporidae	Y0026	0	0	0	P	0	0	0	0
Diastoporidae	Y0037	0	0	0	0	0	0	0	0
Eurystrotos compacta	Y0039	0	0	0	0	0	0	0	0
Diplosolen obelia	Y0044	0	0	0	0	0	0	0	0
Entalophoroecia deflexa	Y0054	0	0	0	P	0	0	0	0
Disporella hispida	Y0066	0	0	0	0	0	0	0	0
Alcyonidium sp.	Y0073	0	0	0	0	0	0	0	0
Alcyonidium diaphanum	Y0076	0	0	10g	0	10g	0	0	0
Alcyonidium mytili	Y0080	0	0	0	P	P	0	0	0
Alcyonidium parasiticum	Y0081	0	P	P	P	P	P	0	P
Vesicularia spinosa	Y0131	0	0	0	2g	0	0	0	0
Eucratea loricata	Y0165	0	0	P	P	P	P	0	0
Electra pilosa	Y0178	0	0	0	P	0	0	0	0
Pyripora catenularia	Y0180	0	0	0	P	0	0	0	0
Flustra foliacea	Y0187	125g	525g	350g	1300g	225g	1300g	50g	200g
Chartella barleei	Y0191	0	0	P	0	0	P	0	P
Callopora craticula	Y0202	0	0	0	0	0	0	0	0
Callopora dumerilii	Y0204	0	0	0	0	0	0	0	0
Tegella unicornis	Y0214	0	0	0	P	0	0	0	0
Bugula avicularia	Y0241	0	0	0	0	0	0	0	0
Scrupocellaria scruposa	Y0279	0	0	P	0	0	0	0	0
Cribrilina punctata	Y0310	0	0	0	0	0	0	0	0
Hippothoa divaricata	Y0332	0	0	0	0	0	0	0	0
Escharella immersa	Y0364	0	0	0	0	0	0	0	0
Escharella ventricosa	Y0370	0	0	0	P	0	0	0	0
Porella concinna	Y0385	0	0	0	0	0	0	0	0
Hippoporina pertusa	Y0414	0	0	0	0	0	0	0	0
Parasmittina trispinosa	Y0465	0	0	0	0	0	0	0	0
Schizomavella auriculata	Y0468	0	0	0	P	0	0	0	0
Schizomavella linearis	Y0474	0	0	0	0	0	0	0	0
Microporella ciliata	Y0480	0	0	0	0	0	0	0	0
Luidia ciliaris	ZB0022	1	1	1	0	0	0	0	0
Luidia sarsi	ZB0023	0	0	0	0	0	0	0	0
Astropecten irregularis	ZB0026	0	0	0	2	0	0	7	0
Anseropoda placenta	ZB0062	0	0	0	0	1	0	0	0
Crossaster papposus	ZB0075	0	0	0	4	0	0	0	0
Henricia sp.	ZB0082	0	0	0	0	2	0	0	0
Henricia sp. (juv.)	ZB0082	0	0	0	1	0	0	0	0
Henricia oculata	ZB0083	1	0	0	2	0	0	0	0
Asteriidae (juv.)	ZB0096	0	0	0	0	0	0	0	0
Asterias rubens	ZB0100	103	169	2	17	1	7	49	58
Ophiothrix fragilis	ZB0124	0	52	0	1	0	1	2	6
Ophiactis balli	ZB0143	0	0	0	0	0	0	0	0
Ophiura albida	ZB0168	0	0	0	0	0	0	0	0
Ophiura ophiura	ZB0170	1	0	3	1	2	0	0	1
ECHINOIDEA (juv.)	ZB0181	0	0	0	0	0	0	0	0
Psammechinus miliaris	ZB0193	1	1	0	6	2	4	0	0
Echinus sp.	ZB0195	0	8	0	1	0	0	0	0
Echinus esculentus	ZB0198	13	35	0	6	0	2	0	2

Taxon	MCS Code	T14	T15	T16	T17	T18	T19	T20	T21
Spatangus sp.	ZB0218	0	0	0	0	0	0	0	0
Spatangus purpureus	ZB0219	0	0	0	0	0	1	0	0
Echinocardium sp.	ZB0222	1	0	0	0	0	0	0	0
Ciona intestinalis	ZD0071	0	0	0	0	0	0	0	0
Ascidiella spp.	ZD0083	0	0	0	1	0	0	0	0
Ascidiella scabra	ZD0085	0	0	3	0	0	0	0	0
Ascidia conchilega	ZD0088	0	0	0	0	0	0	0	0
Pelonaia corrugata	ZD0102	0	0	0	0	0	0	0	0
Styela clava	ZD0104	0	0	0	0	0	0	0	0
Polycarpa pomaria	ZD0115	0	0	0	1	0	0	0	0
Botryllus schlosseri	ZD0126	0	0	P	P	P	0	0	0
Botrylloides leachi	ZD0128	0	0	0	0	P	0	0	0
Leucoraja naevus	ZF0095	0	0	0	0	0	0	0	0
Lotinae (juv.)	ZG0???	0	1	0	0	0	0	0	0
OSTEICHTHYES (=?Gobiidae)	ZG0001	0	0	0	0	0	0	0	0
Argentina sphyraena	ZG0058	0	0	0	0	0	0	0	0
Lophius piscatorius	ZG0094	1	0	0	0	0	0	0	0
Ciliata septentrionalis	ZG0112	0	1	0	0	0	0	0	0
Gadus morhua	ZG0116	0	0	0	0	0	1	0	0
Melanogrammus aeglefinus	ZG0121	0	0	0	0	0	0	0	2
Merlangius merlangus	ZG0123	0	0	0	0	0	0	0	0
Molva molva	ZG0129	0	0	0	0	0	0	0	0
Trisopterus minutus	ZG0144	0	0	0	0	0	0	0	2
Zeus faber	ZG0209	1	1	1	0	1	0	0	0
Entelurus aequoraeus	ZG0237	0	0	0	0	0	1	0	2
Taurulus bubalis	ZG0238	0	0	0	0	0	0	0	0
Aspitrigla cuculus	ZG0262	2	1	0	0	0	0	0	0
Eutrigla gurnardus	ZG0265	9	0	0	0	0	0	0	0
Myoxocephalus scorpius	ZG0281	0	1	0	0	0	0	0	0
Agonus cataphractus	ZG0291	15	2	1	23	5	4	0	2
Blenniidae	ZG0406	0	0	0	0	0	0	0	0
Chirolophis ascanni	ZG0425	0	0	0	0	0	0	0	0
Pholis gunnellus	ZG0440	0	2	0	0	0	0	0	0
Ammodytes sp.	ZG0442	28	0	0	2	0	39	1	7
Gymnammodytes semisquamatus	ZG0446	3	0	0	0	0	0	0	0
Hyperoplus lanceolatus	ZG0449	14	0	0	1	0	1	3	0
Callionymus lyra	ZG0452	10	1	4	7	6	1	4	12
Gobiidae	ZG0455	2	10	0	2	1	0	0	0
Phrynorhombus sp.	ZG0550	0	0	0	0	0	0	0	0
Phrynorhombus norvegicus	ZG0551	0	5	0	2	0	2	0	0
Arnoglossus laterna	ZG0562	0	0	1	0	0	0	0	0
Limanda limanda	ZG0572	22	0	1	2	0	30	61	62
Microstomus kitt	ZG0574	2	3	0	6	0	0	0	0
Pleuronectes platessa	ZG0578	1	0	2	1	2	1	0	0
Buglossidium luteum	ZG0585	0	0	0	0	0	1	0	0
Microchirus variegatus	ZG0588	7	1	1	5	0	10	0	3