



ISLE OF MAY SEASEARCH 2001 AND 2002

REPORT

CHRISTINE HOWSON & CALUM DUNCAN

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A REPORT TO SCOTTISH NATURAL HERITAGE



Photo: Cameron Small

Seasearch participants on the Thistle 'B', September 2002



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SCOTTISH NATURAL HERITAGE**

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SYNOPSIS

Seasearch is a programme of Phase 1 marine biological survey, developed by the Marine Conservation Society (MCS) and the Joint Nature Conservation Committee (JNCC), designed to give sports divers an opportunity to participate in marine biological surveys, and to contribute to the information from an area by recording habitats and species. The Isle of May on the east coast of Scotland is home to the fourth largest breeding group of grey seals in the British Isles. The rocky reefs in the tide-swept waters around the island support kelp forests and turfs of anemones, sponges and hydroids, communities which provide foraging grounds for the seals. The island has been proposed to the EC as a European marine site to protect the seals and the reefs and it has been designated as a Special Protection Area to protect the large colonies of breeding seabirds. The island's proximity to Edinburgh and its attraction as a local diving site combined with the need for additional information to support its conservation status made the Isle of May an obvious choice for a series of Seasearch day trips for local divers.

This Seasearch survey was organised by MCS as a series of day trips over three weekends during the summers of 2001 and 2002. Diving was carried out from the hard boat 'Thistle B' of Aquatrek Diving Services based at North Berwick in East Lothian. The day trip format enabled a total of 29 divers to be involved, with most only taking part in one or two days' survey. The majority were local divers, although several travelled from further afield in order to complete the accreditation dives for a Seasearch Observer course. This project was part-funded by Scottish Natural Heritage.

Seasearch Observer and Surveyor recording forms were completed for 45 sites. 14 biotopes were recognised, and their distribution mapped. A species list has been compiled and CD-ROMs of photographs produced.

The range of biotopes recorded was characteristic of south-east Scotland and corresponded well with the results from earlier surveys, although there appeared to be a greater preponderance of the large brown alga *Desmarestia aculeata* during the Seasearch surveys. Gullies and caves in shallow water had rich turfs of anemones, ascidians, bryozoans and dead men's fingers on their walls. Kelp forests were generally heavily grazed by sea urchins as was the rock zone below the kelp, and there were relatively few species of algae and animal on the open rock and kelp stipes. In the more tide-swept areas, dead men's fingers were abundant on the rock and the deepest rock on the north and south ends of the island had dense beds of brittlestars. Sediments beyond the rock and boulder slopes were mixed, and supported hydroids and an apparently rich infauna, although this was not surveyed in detail. Kelp extended into deeper water on the east than the west coast, indicating a greater water clarity on the more exposed eastern side of the island.

Interesting species recorded include the anemone *Bolocera tuediae* and the wolf fish *Anarhichas lupus*, both northern species which are known to occur inshore in this part of the North Sea. The cup coral *Caryophyllia smithii* was found; this is very common on the west coast and around Orkney and Shetland but is only occasionally found in this part of the North Sea. The sun fish *Mola mola* is an open ocean species which is widespread but uncommon; this sighting in the Firth of Forth was very unusual.

This survey provided a good spread of sites around the Isle of May with enough information to supplement other surveys of the area. Whilst the survey was not designed to collect detailed information on species distributions, it has proved possible to assign at least provisional biotopes to most of the records. These compare well with those recorded from earlier surveys with the project identifying some potential changes since the MNCR survey of Bennett (1989).

1 INTRODUCTION

1.1 Background to survey

The Isle of May or May Isle lies on the east coast of Scotland at the junction of the sheltered waters of the Firth of Forth and the more open expanses of the North Sea. This small, elongate rocky island has sheer cliffs and caves on its west coast and more gentle rocky slopes on its eastern shore, and is home to thousands of seals and seabirds. Strong tides run around its headlands, and the rocky reefs in these tide-swept waters support kelp forests and turfs of anemones, sponges and hydroids. These communities provide foraging grounds for the seals which bask on the rocky shores.

The island supports the fourth largest breeding group of grey seals in the British Isles, and, as the UK has about 40% of the world population of grey seals, the island is of international conservation importance. In recognition of this, the island has been proposed to the EC as a European marine site to afford protection for the seals and the rocky reefs on which they breed and feed. The island has also been designated as a Special Protection Area to protect the thousands of breeding seabirds.



Photo: Christine Howson

Shallow rock wall on the west coast of the May Isle

The Isle of May has attracted marine biologists to its shores since the 1880's when Rattray and Henderson listed the species they found living on its shores (Henderson 1884a, 1884b; Rattray 1886a, 1886b). A century later the island was surveyed by the Marine Nature Conservation Review (MNCR) (Bennett, 1989) and more recently, broad-scale surveys have been carried out for Scottish Natural Heritage (ERTSL, 2003). The island's proximity to Edinburgh and its attraction as a local diving site combined with the need for additional

information on the shallow rocky communities to support its proposed status as a Special Area of Conservation (SAC) made the Isle of May an obvious choice for a series of Seasearch day trips for local divers.

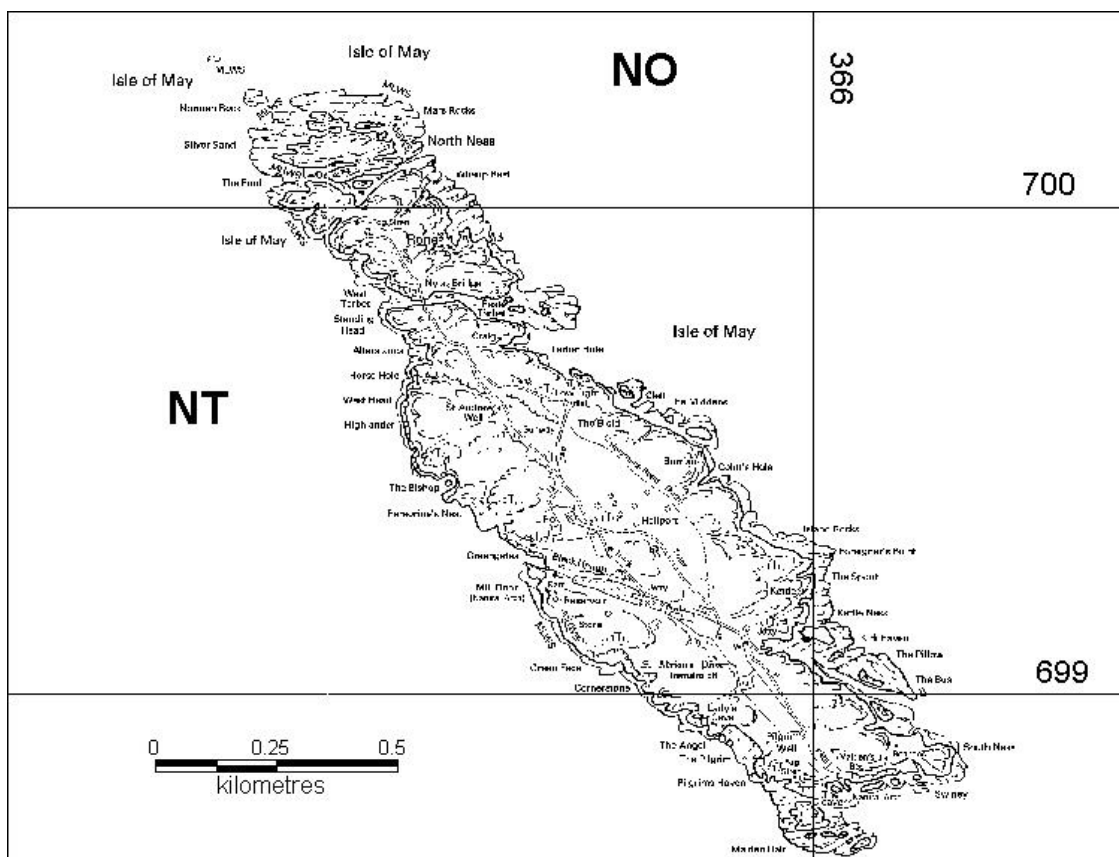


Figure 1 Location of survey area

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1.2 Isle of May

The Isle of May is formed of an olivine-dolerite sill, which is tilted in an easterly direction with vertical cliffs on the western side. These reach a height of 60 m and have numerous arches, stacks and caves. The eastern side is more gradually sloping. Fault lines have divided the island into a number of islets separated by intertidal channels – North Ness, Rona and the main island.

The shores of the island are predominantly rocky with occasional pockets of sediment restricted to bays. There are vertical faces, slopes, ledges and rock pools. The east coast of the island is more exposed to wave action than the west, but the distribution of the rocky intertidal biotopes around the island is determined largely by the angle of slope of the rocky shores, with steep to vertical shores on the west supporting barnacles and mussels and more gradually sloping shores on the east characterised by fucoid and barnacle mosaics. The large number of seabirds means that much of the upper rocky shore is covered by the tiny green alga *Prasiola stipitata*, a species which is characteristic of shores with guano.

The cliffs on the west coast of the island continue into the sublittoral to a depth of only about 3 m where they give way to a boulder slope. This continues to approximately 14 m where a plain of boulder and cobble on muddy shell gravel begins. On the east coast, a steep bedrock slope extends from the shore to a depth of about 20 m. A boulder slope beyond this changes to a cobble, pebble and shell gravel plain at about 25 m. This continues to at least 36 m but along the north and north east side of the island it forms only a narrow band and there is a plain of clean shell gravel from about 25 m. The tides run most strongly around the north-western and south-eastern tips of the island.

1.3 SEASEARCH

Seasearch is an underwater habitat surveying project for recreational SCUBA divers in the UK, extending to approximately five miles off the coast within depths of about 30 m. With over 16,000 km of coastline in Scotland alone, vast tracts of our inshore seabed remain unsurveyed. Simple but accurate seabed observations recorded by divers can help map the various kinds of habitats and marine life surrounding Scotland. Through Seasearch, recreational divers can therefore make a real contribution to marine conservation in Scotland. Collation of baseline habitat data from Seasearch volunteers can form the precursor to specialised professional surveys in newly identified areas of interest.



Photo: Christine Howson

Seasearch diver surveying a rocky seabed

With a growing baseline of knowledge gathered into a national database it is possible to identify which seabed types are most widespread, where there are unusual or important underwater features, and which species of marine wildlife are rarest or most abundant. Records from frequently visited sites will also help to identify where changes may be occurring. This information is vital in providing a framework for management decisions and conservation activities to protect and enhance our marine environment.

A National Seasearch Steering Group (NSSG) was established in 1999 to develop the potential of the project. The NSSG members include statutory conservation bodies (Scottish Natural Heritage, English Nature, Countryside Council for Wales and Joint Nature Conservation Committee), the Environment Agency, Non-Governmental Organisations (Marine Conservation Society and The Wildlife Trusts), the Marine Biological Association (MarLIN), diver training organisations (BSAC, SSAC, PADI and SAA), the Nautical

Archaeology Society and independent marine life experts. The Marine Conservation Society with the support of Scottish Natural Heritage is responsible for coordinating Seasearch activities in Scotland. The Isle of May expeditions were an excellent opportunity to use the Seasearch Surveyor and Observer forms being piloted throughout the UK in 2002.

2 PREVIOUS WORK IN THE AREA

The MNCR carried out a diving and intertidal survey of the Isle of May in 1988, sampling 30 sites around the island (Bennett, 1989). The descriptions given below are based on the results of that survey.

In the intertidal zone, much of the cliff area on the western side was covered by mussels and barnacles whilst on the more gradually sloping rock and in the more sheltered bays and inlets the fucoids *Fucus vesiculosus* and *Ascophyllum nodosum* were present either as a mosaic with barnacles or as denser blankets.

In the sublittoral fringe there was a zone of *Alaria esculenta* and *Laminaria hyperborea* on the vertical west coast rocks with a forest of *Laminaria hyperborea* from 3 m on the boulder slope. On the more gradually sloping east coast *Laminaria digitata* dominated the sublittoral fringe, again with *L. hyperborea* in the upper infralittoral. At the bottom of the *L. hyperborea* forest was a band of *Laminaria saccharina* mixed with *Saccorhiza polyschides*. This reached 9 m on the west coast and 13 m on the east. Below this, the lower infralittoral extended to about 14 m and was dominated by encrusting coralline algae and the sea urchin *Echinus esculentus* with dead men's fingers *Alcyonium digitatum*, the keel worm *Pomatoceros triqueter* and the brittlestar *Ophiothrix fragilis*. *A. digitatum* dominated the zone of boulders below this grazed rock.

On the west coast, there was a plain of boulder, cobble and gravel at about 16 m and this supported a hydroid and bryozoan community dominated by *Abietinaria abietina* and *Nemertesia antennina* with the burrowing anemone *Cerianthus lloydii* and the razor shell *Ensis arcuatus* in the sediment. On the north, east and south coasts, the boulders continued into deeper water where they were covered with beds of the brittlestars *Ophiocomina nigra* and *Ophiothrix fragilis*. These formed a dense blanket in the more tide-swept areas at the northern and southern ends of the island. This zone continued to at least 26 m where, at the two ends of the island, it gave way to boulder, cobble and muddy gravel. Along the north-east coast, however, there was a clean sand plain with the burrowing sea cucumber *Neopentadactyla mixta* from about 26 m.

There are caves in the cliffs of the west coast which extend into the sublittoral zone. The cave walls supported rich surge communities with sponges such as *Clathrina coriacea* and mats of anemones, particularly *Sagartia elegans*, hydroids, bryozoans and ascidians including *Polyclinum aurantium*, *Sidnyum turbinatum* and *Botryllus schlosseri*.

Amongst the relevant earlier surveys of the area was a study of the algae within the Firth of Forth carried out by Wilkinson & Scanlan (1987). They recorded 33 species of green, 37 species of brown and 47 species of red algae from the shores of the Isle of May and considered these shores to be rich in attached algae. Prior to this, Walker (1958) carried out surveys of the laminarian resource around Scotland during the post-war years. Five areas, including the Isle of May, were selected for studies of the sublittoral populations to provide baseline data for any subsequent studies. It was found that the more exposed north east side of the island supported more *Laminaria hyperborea* than the more sheltered north west, where *Laminaria saccharina* was the dominant laminarian.

3 METHODS

3.1 Survey facilities

This Seasearch survey was organised by Calum Duncan of MCS and Lothian Divers as a series of day trips over three weekends during the summers of 2001 and 2002 – 2nd June 2001, 10th & 11th August and 14th & 15th September 2002. Diving was carried out from the hard boat 'Thistle B' based at North Berwick in East Lothian and skippered by Cameron Small and Brian Anderson of Aquatrek Diving Services. The day trip format enabled a total of 29 divers to be involved, with most only taking part in one or two days' survey. The majority of the divers were based in Edinburgh and the Lothians, although several travelled from further afield for the last trip in order to complete the accreditation dives for a Seasearch Observer course held earlier in the summer. This project was part-funded by Scottish Natural Heritage.

3.2 Site selection and position fixing

Sites were selected to cover as much of the island as possible whilst providing a spread of sites around the main habitat types. Weather conditions had a major influence on the site selection with sea conditions restricting diving on some days to the north-west of the island. Positions were recorded with the Thistle B's GPS.

3.3 Survey techniques

Divers worked in pairs with the divers descending to the deepest depth of the dive where they then began recording the main habitat features and prominent species, using underwater writing boards. Ascending up the slope in a predetermined direction, usually directly towards the shore, they stopped to record different habitats and the most conspicuous species, noting the depth at which changes occurred. Species were recorded according to the diver's capabilities. The information was later transferred to Seasearch forms, with the less experienced surveyors completing the Observation form and the more experienced the Survey form. The Observation Form is the basic Seasearch survey form, requiring details of the site location, a sketch of the underwater terrain and some basic information about the types of seabed and plant or animal cover present. It also allows divers to record as many species as they are able. The Survey form requires the surveyor to divide the site into habitats and record a description, some basic information and a species list for each habitat. More details of these methods are included in the Seasearch Observer and Surveyor Course participant packs.

Few specimens were collected as logistics on this survey did not include facilities for identification or specimen preservation. However, field guides were available to assist with species recognition and biologists on the survey were able to help with identifying specimens in the field. Underwater photographs were taken by Emma Whinfield, Lee Patchell, Christine Howson and Jean Manson.

3.4 Data analysis

A list of sites surveyed with their location was compiled and species recorded were entered into an Excel spreadsheet. Upon completion of the survey, depths on the recording forms were corrected to Chart Datum using a Windows tidal programme. The survey forms were examined and biotope codes according to the Marine Nature Conservation Review (MNCR) manual (Connor et al, 1997) were assigned to habitat descriptions where possible, although sometimes the data were inadequate for this task (see discussion). Biotopes from the MNCR database which had previously been recorded in the area were used to help in this task.

The following series of Excel spreadsheets was compiled from the information recorded on the survey forms:

- Site information including site location and biotope codes;
- Species list;
- Seabed types.

These lists were imported into the MapInfo® Geographical Information System (GIS), along with locations of biotopes recorded at previous survey sites. This enabled the sites and features recorded to be mapped and compared directly with earlier data.

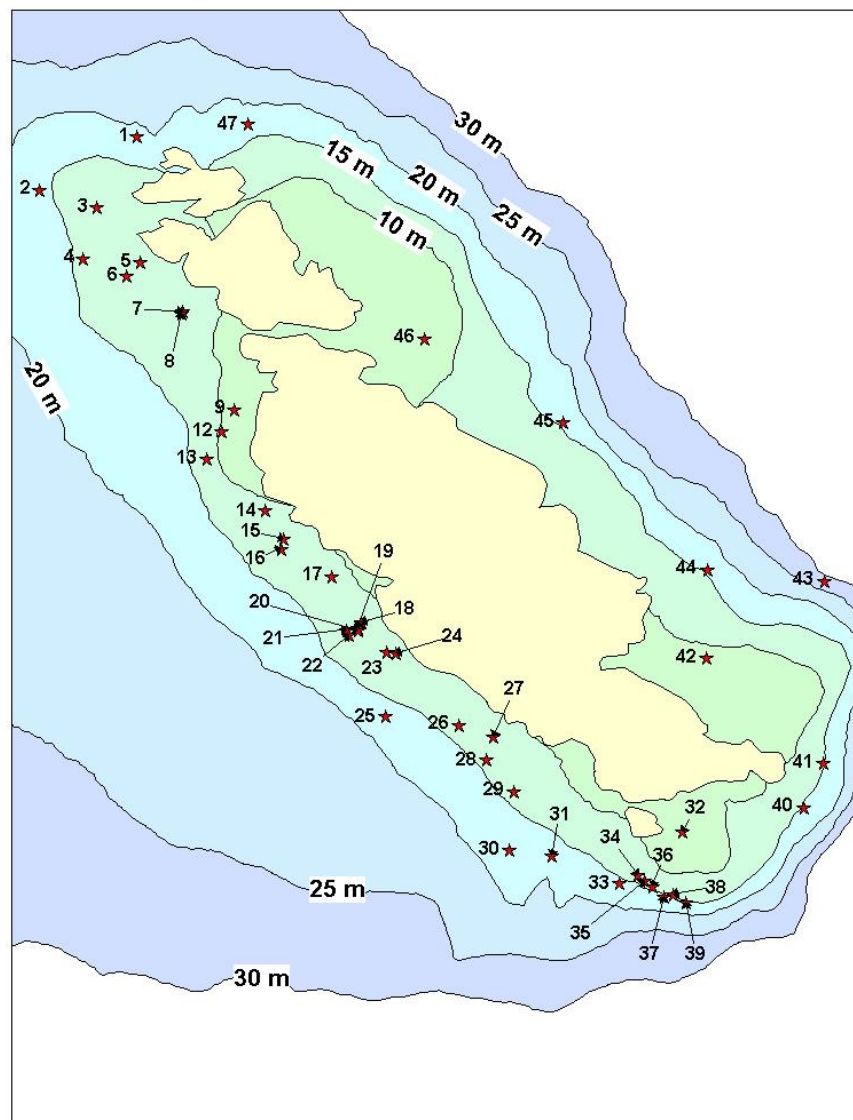


Figure 2 Survey sites around the Isle of May
Depth information is from ERTSL (2003)

4 RESULTS

Survey forms were completed for 45 sites; the positions of 2 of these could not be located so they have been excluded from the maps. The records consisted of 13 sets of Observation forms, 24 Survey forms and 8 pre-2002 style Survey forms. Some sites had several forms as individual divers had filled in separate forms. The site positions are listed in Appendix 2 and are shown in Figure 2, which also shows sites surveyed by previous workers.

Fourteen biotopes (Connor *et al.*, 1997) were assigned provisionally to habitats at the sites surveyed. As this exercise was based on limited information, the biotope identifications should be treated with caution. These are listed in Appendix 3; the site list in Appendix 2 lists the sites with their associated biotopes and other data. More detailed descriptions of the biotopes are given in Connor *et al.* (1997) and are not repeated here. Appendix 4 lists the species recorded. Figures 3 and 4 show the distribution around the island of the major biotopes, and compare these with previous records.

Finally, Figure 5 shows the distribution of substrata types as recorded on the survey forms.

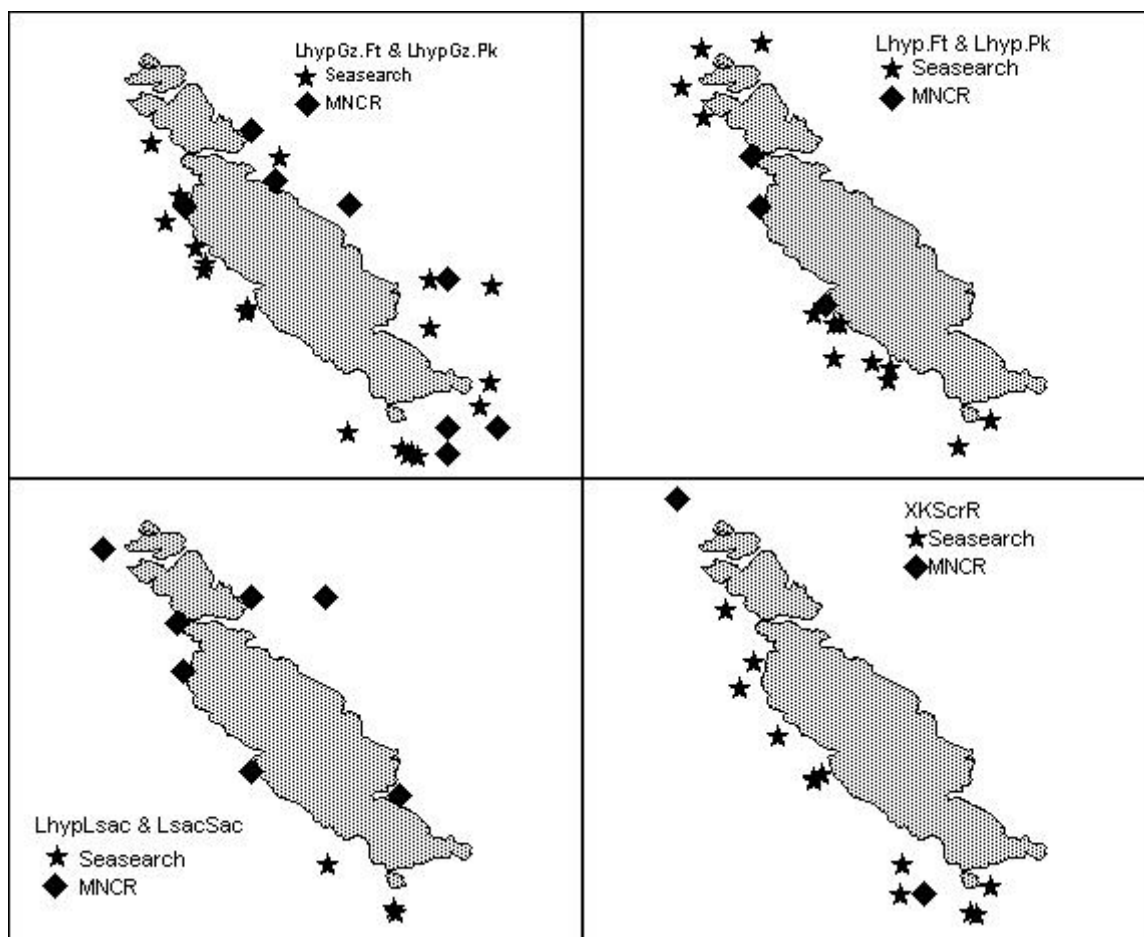


Figure 3 Distribution of major kelp forest biotopes

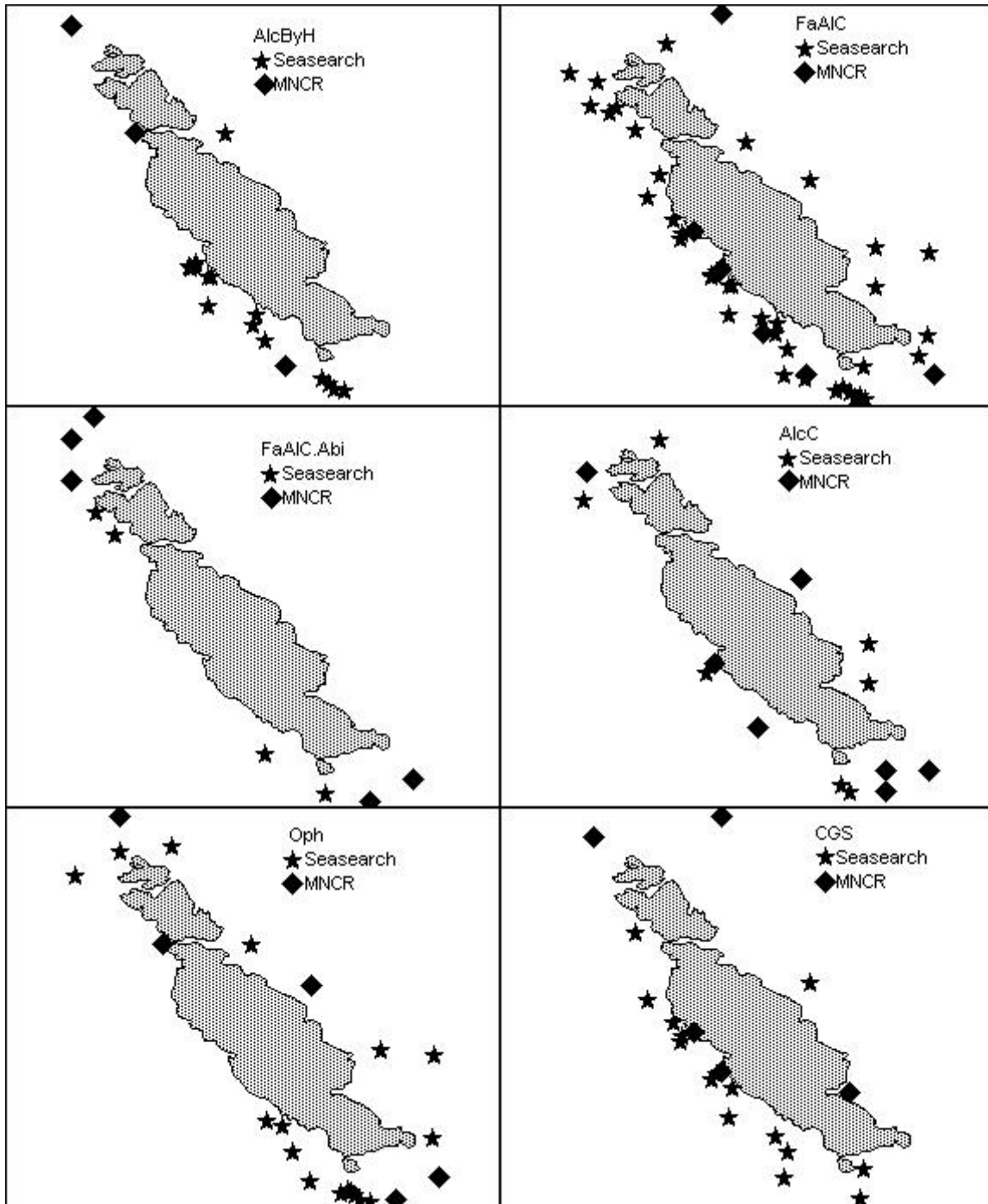


Figure 4 Distribution of major circalittoral biotopes

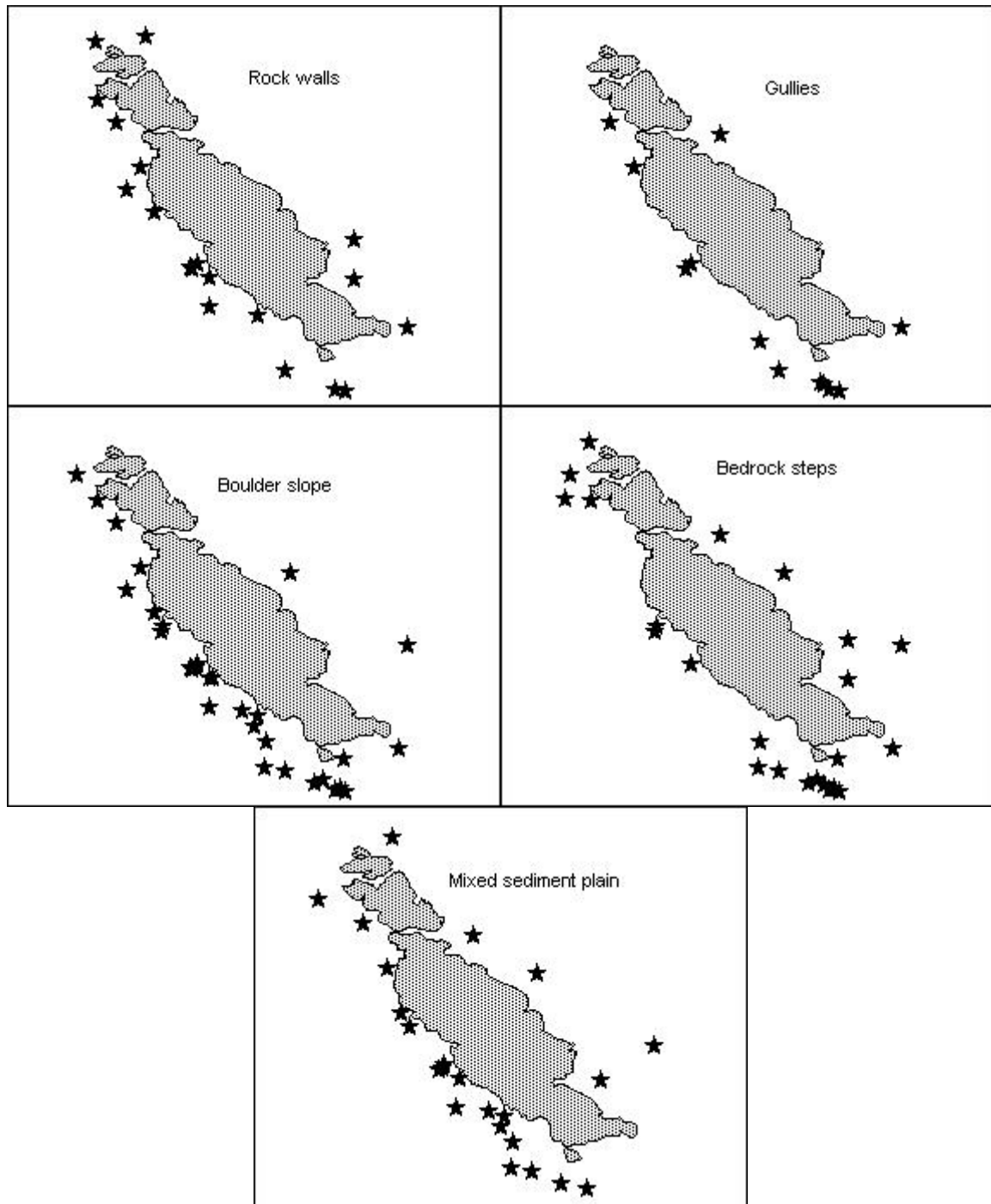


Figure 5 Distribution of major habitat types

5 DISCUSSION

5.1 Biotope codes

Biotope codes have been assigned to the habitats described or drawn in the recording forms according to the descriptions in the MNCR manual (Connor *et al.*, 1997). Three different styles of recording form were used, depending on the level of experience of the surveyors. The Observer form contains limited information about the habitats present and lists only the most conspicuous species. The Surveyor form, which divides the site into different habitats, has scope for more detailed species lists and habitat descriptions. A third style of form, the pre-2002 Dive Recording form, asks for descriptions of the main habitats present but does not have scope for recording a species list. The information available on some of the forms was therefore more detailed than on others and the Seasearch Observer forms in particular are not really designed for such detailed interpretation. However, there was enough information on many of the Surveyor forms to enable biotopes to be assigned with reasonable confidence and there was a good spread of these forms around the island (Figure 6).

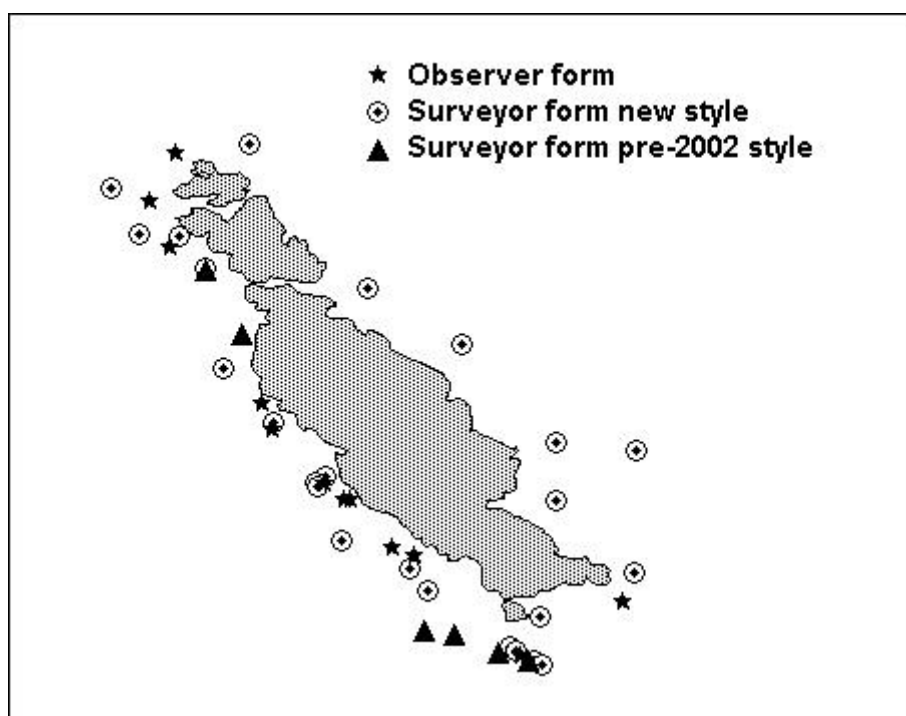


Figure 6 Distribution of the various record types

There are a number of differences with the biotopes recorded by the MNCR surveys (Figures 3 & 4), particularly in the infralittoral zone. The algae were generally incompletely recorded during the Seasearch work and, unless it was mentioned in the habitat description, it was not always easy to tell if a kelp forest was heavily grazed. The LhypGz biotopes may be more widely distributed than Figure 3 indicates. Another difference is in the records of the mixed kelp biotopes. The MNCR recorded these predominantly as either LsacSac or LhypLsac. *Laminaria saccharina* was only infrequently recorded during the Seasearch surveys; the large bushy brown alga *Desmarestia aculeata*, on the other hand, was abundant in the lower infralittoral and this was classified as XKScrR. This may be a real difference between the two surveys rather than an artefact of recording methods.

5.2 Distribution of biotopes

The majority of the sites surveyed during this Seasearch project were on the west coast of the Isle of May, beneath the cliffs due to weather conditions which limited diving on the more exposed east coast. Several sites were dived by more than one pair of surveyors; this gave an opportunity for a mixture of record types and photographs from one area.

5.2.1 Rocky infralittoral

The infralittoral zone was dominated by kelp forest, with the predominant kelp species in the upper infralittoral being *Laminaria hyperborea*. Kelp was recorded to a maximum depth of 13 m on the south-eastern tip of the island (Site 40), one of the most exposed sites dived but was only recorded to 3 m at Site 9, one of the most sheltered sites dived. There was a difference between the east and west coasts, with the kelp forests extending deeper on the east than on the west. This is not simply a factor of substratum availability as there was plenty of rock available below the kelp on the west

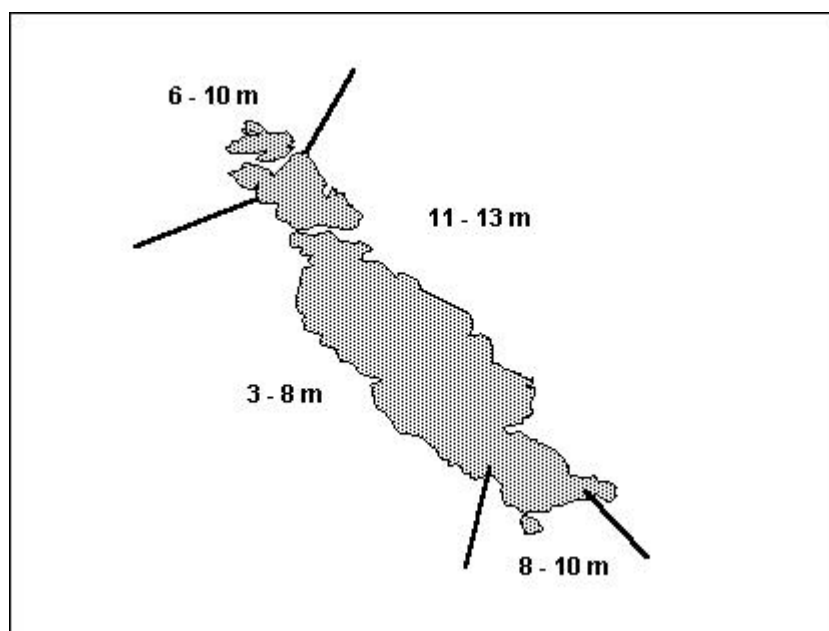


Figure 7 Maximum depth to which kelp was recorded

The dominant kelp species in the upper infralittoral was *Laminaria hyperborea*, with two main types of *L. hyperborea* forest found:

- Lhyp.Ft and Lhyp.Pk Kelp forest with an understorey of foliose red algae, some animals but no turf;
- LhypGz.Ft and LhypGz.Pk Grazed forest with few red algae on stipes or rock, coralline crusts abundant.

It was not always possible from the records to separate these types, as this depended on how much detail was included on the drawings and in the habitat notes, and when there was any doubt, the records were classified as Lhyp. There was no clear pattern in their distribution although the northern tip and south-western side of the island appeared to be less grazed than elsewhere. In general, grazing by urchins was very pronounced around the whole island, reducing the diversity of species found within the kelp forests, and this is

probably one of the major factors limiting the maximum depth of kelp. A second factor is almost certainly differences in available light on the more exposed east (more light) and more sheltered west (less light) coasts.



Photo: Christine Howson

Kelp forest grazed by sea urchins

The lower infralittoral zone at many sites along the west side of the island was dominated by the large bushy alga *Desmarestia aculeata* (XKScrR), often with some *Laminaria saccharina* and *Saccorhiza polyschides* present. On the east side, the lower infralittoral contained more *Laminaria hyperborea*. There was plenty of available stable bedrock and boulders in both areas to support kelp; the predominance of *D. aculeata* may be related to the effects of intensive grazing preventing the establishment of *Laminaria* plants.

In shallow water above the main forest at the most exposed locations the sublittoral fringe contained the surge-tolerant *Alaria esculenta*. As this biotope is restricted to very shallow water, it may well have been missed at other locations.

Rock beneath the kelp was at most sites covered by coralline, dark red and brown algal crusts with large numbers of sea urchins *Echinus esculentus*, keel worms *Pomatoceros* sp. and barnacles *Balanus crenatus* and *Balanus balanus*. Other species that were conspicuous included the dahlia anemone *Urticina felina*, *Sagartia elegans*, the velvet swimming crab *Necora puber*, the common starfish *Asterias rubens* and ascidians including the light bulb tunicate *Clavelina lepadiformis*. Top shells *Gibbula cineraria*, hydroids *Obelia geniculata* and bryozoans *Membranipora membranacea* were common on the kelp plants. Red algae in the less grazed areas included *Cryptopleura ramosa*, *Bonnemaisonia asparagoides*, *Odonthalia dentata*, *Delesseria sanguinea* and *Phycodrys rubens*. A feature of many of the kelp sites was large numbers of fish particularly Ballan wrasse, Goldsinny wrasse, Two-spotted gobies and Butterfish.

5.2.2 Rocky circalittoral

Circalittoral rock extended to at least 28 m on the south-east of the island (Site 43), 25 m on the southern tip at Maiden Hair (Sites 34 – 39) and 22 m at site 1 on the northern tip. Along

the east coast, the lower limit of the rock and boulder slope where a mixed sediment plain began was measured at between 9 and 17 m, with an average depth of 14 m. At most sites there was a mixture of stepped bedrock and boulder slopes; in some places the boulders were shallower than others but the fauna on the boulders and bedrock was broadly similar. The biotope diversity was low, partly due to the heavy grazing by sea urchins in the circalittoral zone.

The most common biotope was rock and boulders dominated by algal and bryozoan crusts and keel worms *Pomatoceros triqueter*, with abundant sea urchins and sparse dead men's fingers (FaAIC). This was found all around the island, often covering all the rock from the bottom of the kelp zone to the rock-sediment interface. Conspicuous species on the open rock were sparse, with the red sunstar *Crossaster papposus* and the common starfish *Asterias rubens* found at many sites, occasional ascidians such as *Ciona intestinalis* and *Ascidia mentula*, anemones *Urticina felina* and *Metridium senile* and scattered clumps of hydroids such as *Kirchenpaueria pinnata* and *Halecium halecinum*. In shallower depths at some sites there was a fuzz of filamentous red algae over patches of rock. Crevices and boulder holes sheltered a greater variety of animals, including squat lobsters *Galathea* spp., edible crabs *Cancer pagurus*, lobsters *Homarus gammarus*, octopus *Eledone cirrhosa*, velvet swimming crabs *Necora puber*, sea cucumbers *Pawsonia saxicola* and shrimps. As in the kelp forest, fish were common with Cuckoo and Ballan wrasse found, wolf fish, scorpion fish *Taurulus bubalis* and Bull rout *Myoxocephalus scorpioides*. At several sites, the boulders extended out onto the mixed sediment plain at the base of the steeper slope. The fauna on these was similar but more diverse, with a greater variety of hydroids, and was classed as FaAIC.Abi. Additional species included the hydroids *Abietinaria abietina*, *Polyplumaria frutescens* and *Sertularia argentea* and the large dahlia anemone *Urticina eques*.



Photo: Christine Howson

Octopus *Eledone cirrhosa* on grazed boulders



Photo: Christine Howson

Urchin-grazed bedrock (FaAIC)

At a number of sites where there was more tidal movement, and particularly around the northern and southern ends of the island, dead men's fingers *Alcyonium digitatum* were more abundant on the circalittoral rock, often with the plumose anemone *Metridium senile*. These sites were classed as AlcC, a biotope very characteristic of the open east coast of Scotland and North-East England; this biotope often occurred below a grazed FaAIC zone. Another feature of the southern and northern ends of the island, where the tides are strongest, were dense beds of brittlestars *Ophiothrix fragilis* which covered the rock steps over much of the circalittoral. These were particularly abundant on the slightly deeper rock off Maiden Hair (Sites 33-39). Associated species were relatively few, as the large numbers of brittlestars tend to smother other species, but were generally similar to those found in the other circalittoral biotopes.



Photo: Christine Howson

Alcyonium digitatum at rock-sediment boundary

Steep-sided rock gullies and caves were common in shallow water, and sea urchins have much less impact on these walls than the more level rock. These gully walls supported a much richer, more colourful faunal turf than elsewhere, with large numbers of surge-tolerant species including the anemones *Sagartia elegans*, *Metridium senile*, dead men's fingers, sponges such as *Halichondria panicea*, *Clathrina coriacea*, *Leuconia nivea* and *Esperiopsis fucorum* and ascidians including *Lissoclinum perforatum*, *Botryllus schlosseri* and *Clavelina lepadiformis*. Nudibranchs were common amongst this rich turf with several species recorded.



Photo: Christine Howson

Alcyonium digitatum on gully walls in shallow water on the west coast

Mobile, clean cobbles were a feature of sites where there were surge gullies in the cliff faces. There were few species recorded as associated with these cobbles although brittlestars and *Urticina felina* were present in places.

5.2.3 Sediments

There was only one major class of sediment recorded, mixed coarse sand and shell with cobbles and boulders (CGS); there was more clean shell gravel around the north of the island. These mixed sediments appeared to support a fairly rich fauna and flora although they were not surveyed in any detail. Where there were significant hydroid communities on the cobbles and boulders, this habitat was classed as FaAIC.Abi (see 5.2.4 above). Species present in addition to the hydroids above included sand gobies *Pomatoschistus* spp., dragonets *Callionymus lyra*, hermit crabs, the sand mason worm *Lanice conchilega*, the swimming crab *Liocarcinus depurator*, scallops *Pecten maximus* and *Aequipecten opercularis*, burrowing bivalves *Mya* sp. and *Ensis* sp., burrowing anemones *Cerianthus lloydii* and the brittlestars *Ophiura ophiura* and *Ophiura albida*.



Photo: Christine Howson

Mixed cobble and sediment seabed

5.3 Interesting species

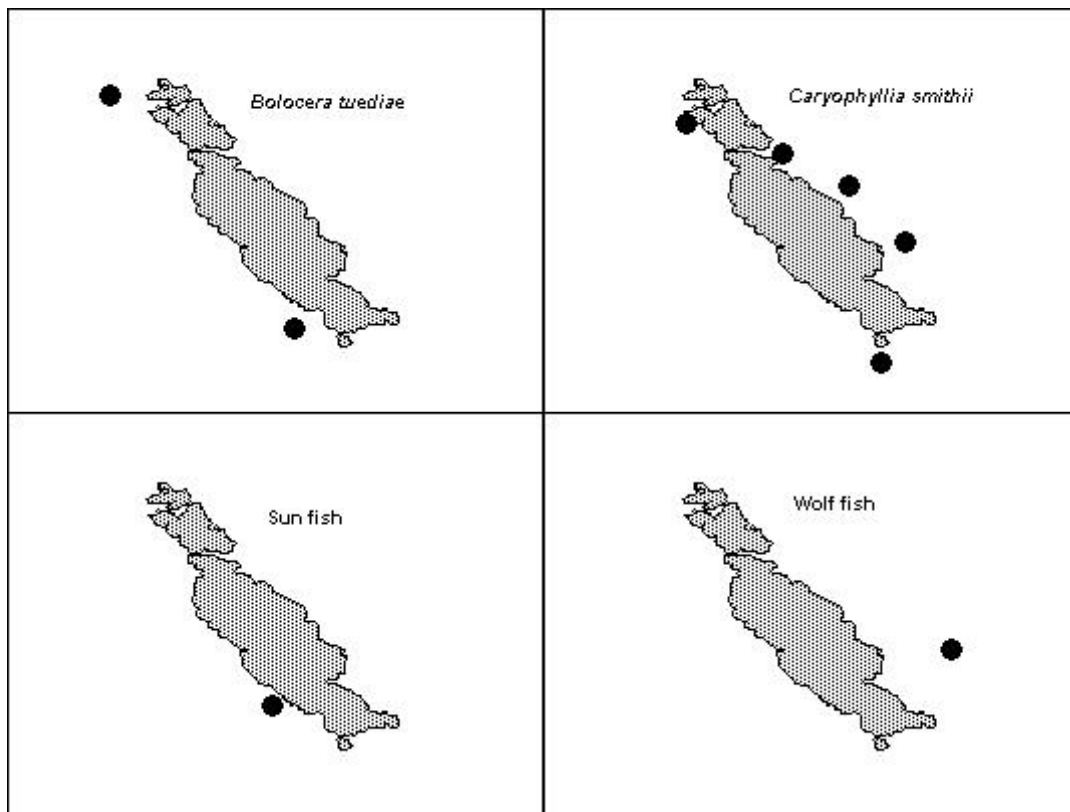


Figure 8 Distribution of species of interest recorded around the Isle of May

The focus of this project was on describing habitats rather than species and therefore there were relatively few species recorded (Appendix 4). However, a number of species of interest to the area were found:

- Wolf fish, *Anarhichas lupus*
- Anemone, *Bolocera smithii*
- Cup coral, *Caryophyllia smithii*
- Sun fish, *Mola mola*

The Wolf fish and the anemone *Bolocera tuediae* are both species with a northern distribution which are found inshore in the North Sea, and known to occur around the rocky areas of the Firth of Forth and St Abbs Head. Both are infrequent inshore on the west coast of Scotland. In contrast, the cup coral is very common in inshore waters of the west coast and occurs around Orkney and Shetland but is only occasionally found in this part of the North Sea. The sun fish *Mola mola* is an open ocean species which is widespread but uncommon; this sighting in the Firth of Forth was very unusual.

6 CONCLUSIONS

This survey provided a good spread of sites around the Isle of May with enough information to supplement other surveys of the area. The survey was not designed to collect detailed information on species distributions. However, it has proved possible to assign at least provisional biotopes to most of the records. These compare well with those recorded from earlier surveys with the project identifying some potential changes since the MNCR survey of Bennett (1989).

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8 ACKNOWLEDGEMENTS

The preparatory work of the survey organiser Calum Duncan ensured that the Seasearch survey ran smoothly. We are extremely grateful to the confident and responsible skippering of the 'Thistle B' hard-boat by Cameron Small and Brian Anderson and their help in position-fixing. Most of all many thanks to the various divers for cheerfully filling in Seasearch forms both between dives on the boat and after the day's diving, compiling much useful data.

APPENDIX 1

SEASEARCH SURVEY FORMS

- **Observer**
- **Surveyor (pre-2001)**
- **Surveyor (post-2001)**

APPENDIX 2
LIST OF SITES SURVEYED

Site No.	Date	Site Name	Name of divers	Min depth (m bcd)	Max depth (m bcd)	Latitude	Longitude	Biotope	Substratum type	Site features
1	10/08/02	Norman Rocks East, Isle of May	Rosey Bayne; Sarah McDonald; Keith Pritchard	5.93	21.93	56 11.607	2 34.030	Lhyp.Ft; Oph	Reef; Boulders; Sand	Boulder wall; Bedrock steps; Sand
2	11/08/02	Norman Rocks West, Isle of May	Sarah McDonald; Lee Patchell; Emma Whinfield	17.55	18.05	56 11.544	2 34.232	FaAIC; Oph	Reef; Cobbles	Level bedrock; Cobbles on rock
3	14/09/02	NW of The Pool	Keith Pritchard; Stephen Midgely	1.23	16.23	56 11.53	2 34.012	Lhyp.Ft; Lhyp.Pk; FaAIC	Reef; Boulders	Boulder slope; Bedrock steps
4	11/08/02	SW of the Pool	Calum Duncan Fiona Crouch	14.54	16.54	56 11.465	2 34.140	AlcC; FaAIC	Reef; Mixed ground	Bedrock steps; Mixed plain
5	14/09/02	SE of The Pool	Emma Whinfield Sarah McDonald	4.1	23.1	56 17890	2 54840	Lhyp.Ft; FaAIC; FaAIC.Abi	Reef; Boulders	Rock wall; Bedrock steps; Boulder slope
6	14/09/02	S of The Pool	Lilias Parks; Melanie Harding	6.3	12.5	56 11.456	2 33.964	FaAIC	Reef; Cobbles; Sand; Mud	Ridged bedrock
7	14/09/02	NW of West Tarbet	Christine Howson; Lee Patchell	3.99	12.29	56 11.40	2 33.84	LhypGz.Ft; XKScrR; FaAIC; FaAIC.Abi	Reef; Boulders; Cobbles; Mixed ground	Rock walls; Rock gullies; Mixed plain
8	02/06/01	NW of West Tarbet	C. Duncan	2.1	11.6	NT 64998	99852	Ala: LhypGz.Ft; XKScrR; FaAIC; CGS	Reef; Boulders; Mixed ground	Rock walls; Boulder slope; Mixed plain
9	02/06/01	North Hole	E. Whinfield; C. Munro	0.41	9.91	NT 65111	99645	LhypGz.Ft; XKScrR; FaAIC	Reef; Boulders; Mixed ground	Rock walls; Rock gullies; Boulder slope; Mixed plain
10	02/06/01	West Rona, Isle of May	C. Holland	-2.43	10.57				Reef; Boulders; Mixed ground	Rock slope; Boulder slope; Mixed plain
11	02/06/01	West Rona, Isle of May	J. Lamb	0.57	10.17				Reef; Boulders; Mixed ground	Rock wall; Rock slope; Boulder slope; Mixed plain
12	14/09/02	West Head, Isle of May	Roddy Hay Maggie McGarrity	3.3	18.3	56 18.777	2 56.415	LhypGz.Ft; LhypGz.Pk; FaAIC; CGS	Reef; Boulders; Mixed ground	Rock wall; Rock slope; Boulder slope; Mixed plain
13	11/08/02	W of The Highlander, Isle of May	Chris Bronsdon; Digger Jackson	3.38	19.38	56 11.235	2 33.879	LhypGz.Ft; XKScrR; FaAIC; CGS	Reef; Boulders; Mixed ground	Rock wall; Boulder slope; Shell gravel plain
14	14/09/02	W of The Bishop, Isle of May	Keith Pritchard; Stephen Midgely	1.98	15.98	56 11.173	2 33.758	LhypGz.Ft; FaAIC; CGS	Reef; Boulders; Cobbles; Mixed ground; Sand	Rock wall; Boulder slope; Mixed plain
15	11/08/02	SW of The Bishop, Isle of May	Ali Davison Frank Fortune	3.38	20.58	56 11.142	2 37.768	LhypGz.Ft; FaAIC; CGS	Reef; Boulders; Cobbles	Bedrock steps; Boulder slope; Mixed plain
16	14/09/02	W of Peregrine's Nest, Isle of May	Lilias Parks; Melanie Harding	1.98	10.98	56 11.130	2 33.725	LhypGz.Ft; XKScrR; FaAIC; CGS	Boulders; Mixed ground; Wreckage	Boulder slope; Bedrock steps

Site No.	Date	Site Name	Name of divers	Min depth (m bcd)	Max depth (m bcd)	Latitude	Longitude	Biotope	Substratum type	Site features
17	15/09/02	W of Greengates, Isle of May	Christine Howson; Lee Patchell	-3.94	-3.94	56 11.100	2 33.619			
18	15/09/02	The Mill Door 3, Isle of May	Calum Duncan; Victoria Leighton	-0.84	13.16	56 11.047	2 33.557	AlcByH; LhypGz.Ft; XKScrR; FaAIC; CGS	Reef; Boulders; Cobbles; Mixed ground	Rock wall; Rock gully; Boulder slope; Bedrock steps; Mixed plain
19	15/09/02	The Mill Door 2, Isle of May	Sarah McDonald; Emma Whinfield	-3.98	-3.98	56 11.040	2 33.564			
20	15/09/02	The Mill Door 1, Isle of May	Roddy Hay; Maggie McGarrity	-0.17	13.83	56 11.024	2 33.532	AlcByH; LhypGz.Ft; FaAIC	Boulders; Cobbles; Mixed ground	Boulder slope; Mixed plain
21	11/08/02	The Mill Door 4, Isle of May	Sarah McDonald; Lee Patchell; Emma Whinfield	-2.85	12.15	56 11.038	2 33.587	AlcByH; XKScrR; FaAIC	Reef; Boulders; Cobbles	Rock wall; Boulder slope
22	14/09/02	The Mill Door 5, Isle of May	Christine Howson; Lee Patchell	3.2	14.5	56 11.032	2 33.583	AlcByH; Lhyp.Ft; XKScrR; FaAIC; AlcC; CGS	Reef; Boulders; Cobbles; Mixed ground; Sand	Rock wall; Rock gully; Cave; Boulder slope; Mixed plain
23	15/09/02	SE of The Mill Door, Isle of May	Susan Miller; Colin McWhirr; Jane Sarginson	-2.17	11.83	56 10.977	2 33.475	AlcByH; Lhyp.Ft; FaAIC	Reef; Boulders; Cobbles	Rock wall; Cave; Boulder slope; cobble plain
24	14/09/02	SE of The Mill Door, Isle of May	M. McGarity; R. Hay	1.73	16.73	56 11.011	2 33.486	AlcByH; Lhyp.Ft; FaAIC; CGS	Reef; Boulders; Mixed ground; Sand	Boulder slope; Mixed plain
25	11/08/02	SW of Green Face, Isle of May	Calum Duncan; Fiona Crouch	2	17.1	56 10.938	2 33.506	AlcByH; Lhyp.Ft; FaAIC; CGS	Reef; Boulders; Mixed ground	Rock wall; Boulder slope; Rock slabs; Mixed plain
26	15/09/02	SW of Cornerstone, Isle of May	Roddy Hay; Maggie McGarrity	3.33	15.33	56 10.927	2 33.334	Lhyp.Ft; FaAIC; Oph	Boulders; Mixed ground; Sand	Boulder slope; Mixed plain
27	15/09/02	SE of Cornerstone, Isle of May	Susan Miller; Colin McWhirr; Jane Sarginson	1.21	16.21	56 10.913	2 33.284	AlcByH; Lhyp.Pk; FaAIC; Oph	Reef; Boulders; Cobbles; Mixed ground; Sand	Rock wall; Cave; Boulder slope; Cobble slope; Mixed plain
28	14/09/02	W of the Angel, Isle of May	Emma Whinfield; Sarah McDonald	3	16	56		AlcByH; Lhyp.Ft; FaAIC; CGS	Boulders; Mixed ground; Sand	Boulder slope; Mixed plain; Fine sand patch
29	14/09/02	W of Pilgrim's Haven, Isle of May	Calum Duncan	1.13	17.13	56 10.87	2 33.34	AlcByH; LhypLsac; XKScrR; FaAIC; Oph; FaAIC.Abi; CGS	Reef; Boulders; Cobbles; Mixed ground	Rock gully; Boulder slope; Rock steps; Mixed plain
30	02/06/01	W Maiden Hair, Isle of May	J. Khan; W. Scott	2.8	12.7	NT 65700	98700	XKScrR; FaAIC; FoR; CGS	Reef; Boulders; Mixed ground	Boulder slope; Rock steps; Mixed plain
31	02/06/01	W Maiden Hair, Isle of May	C. Duncan	2.2	24.2	NT 65791	98688	Ala: LhypGz.Ft; LhypGz.Pk; FaAIC; Oph	Reef; Boulders; Sand	Rock wall; Rock gullies; Bedrock steps; Boulder slope; Mixed plain
32	10/08/02	East Maiden Hair, Isle of May	Alan Fraser; Digger Jackson	5.45	16.45	56 10.800	2 32.922	Lhyp.Ft; XKScrR; FaAIC; CGS	Reef; Boulders	Rock steps; Boulder slope
33	02/06/01	SW Maiden Hair, Isle of May	G. Swan	6.35	23.35	NT 65934	98629	Lhyp.Ft; Lhyp.Pk; FaAIC; Oph	Reef; Boulders; Mixed ground	Rock steps; Boulder slope; Mixed plain

Site No.	Date	Site Name	Name of divers	Min depth (m bcd)	Max depth (m bcd)	Latitude	Longitude	Biotope	Substratum type	Site features
34	15/09/02	S Maiden Hair, Isle of May	Calum Duncan; Victoria Leighton	1.9	18.6	56 10.758	2 32.981	AlcByH; LhypLsac; FaAIC; Oph	Reef; Boulders	Rock steps; Boulder slope
35	15/09/02	S Maiden Hair, Isle of May	Sarah McDonald; Emma Whinfield	2.82	12.32	56 10.733	2 32.9	LhypLsac; XKScrR; Oph; AlcC; FaAIC.Abi	Reef	Rock Steps; Rock gully
36	15/09/02	S Maiden Hair, Isle of May	Christine Howson; Lee Patchell	-1.18	13.82	56 10.744	2 32.950	AlcByH; LhypGz.Ft; XKScrR; FaAIC; Oph	Reef	Rock slope; Rock steps; Rock gully
37	02/06/01	S Maiden Hair, Isle of May	E. Whinfield; C. Munro	0.46	19.46	NT 66030	98603	AlcByH; LhypGz.Ft; LhypGz.Pk; FaAIC; AlcC; Oph	Reef; Boulders; Cobbles	Rock wall; Rock gully; Rock steps; Boulder slope
38	14/09/02	S Maiden Hair, Isle of May	Calum Duncan; Victoria Leighton	4.01	19.51	56 17931	2 55063	LhypGz.Ft; FaAIC; CGS	Reef; Boulders; Mixed ground	Boulder slope; Rock steps; Mixed plain
39	02/06/01	SE Maiden Hair, Isle of May	C. Bronsdon	-2.08	21.32	66077	98587	LhypGz.Ft; LhypGz.Pk; AlcByH; FaAIC; Oph	Reef	Rock wall; Rock gully; Rock steps; Boulder slope; Rock slope
40	10/08/02	S Point of South Ness, Isle of May	Rosey Bayne; Sarah McDonald; Keith Pritchard	0	0	56 10.837	2 32.639	LhypGz.Ft; LhypGz.Pk; FaAIC	Reef; Boulders	Rock steps; Boulder slope
41	11/08/02	E of South Ness	Ali Davison; Frank Fortune	4.52	24.32	56 10.888	2 32.600	LhypGz.Ft; FaAIC; Oph	Reef; Boulders; Cobbles	Rock wall; Rocky gully; Boulder plain
42	10/08/02	Kirk Haven, Isle of May	Lee Patchell; Emma Whinfield	2.07	9.77	56 11.009	2 32.843	LhypGz.Ft; LhypGz.Pk; AlcC; FaAIC	Reef; Boulders; Mixed ground	Rock steps; Rock wall; Boulder plain; Mixed plain
43	11/08/02	Offshore, E of Foreigner's Point, Isle of May	Chris Bronsdon; Digger Jackson	6.02	30.22	56 11.099	2 32.600	LhypGz.Ft; FaAIC; Oph	Reef; Boulders; Mixed ground	Boulder slope; Rock steps; Mixed plain
44	10/08/02	E of Foreigner's Point, Isle of May	Calum Duncan; Fiona Crouch	7.4	17.4	56 11.111	2 32.843	LhypGz.Ft; LhypGz.Pk; AlcC; FaAIC; Oph	Reef; Boulders	Rock steps; Rock wall; Boulder & cobble plain
45	10/08/02	SE of Tarbert Hole, Isle of May	Calum Duncan; Fiona Crouch	12.08	24.48	56 11.280	2 33.142	FaAIC; CGS	Reef; Boulders; Mixed ground	Rock steps; Boulder slope; Mixed plain
46	10/08/02	East Tarbert, Isle of May	Lee Patchell; Emma Whinfield	8.69	15.69	56 11.372	2 33.502	AlcByH; LhypGz.Ft; LhypGz.Pk; FaAIC; Oph	Reef; Cobbles; Mixed ground	Rock slope; Rock gully; Rock steps; Rock & mixed plain
47	10/08/02	NE North Ness, Isle of May	Alan Fraser; Digger Jackson	8	24	56 11.622	2 33.800	Lhyp.Pk; AlcC; FaAIC; Oph	Reef; Boulders; Mixed ground	Rock wall; Boulder plain; Mixed plain

APPENDIX 3

LIST OF BIOTOPES RECORDED

Biotope Code	Biotope name	Site numbers
Ala	<i>Alaria esculenta</i> on sublittoral fringe bedrock	8, 31
Lhyp.Ft	<i>Laminaria hyperborea</i> forest and foliose red seaweeds on moderately exposed infralittoral rock	22, 23, 24, 25, 28
Lhyp.Pk	<i>Laminaria hyperborea</i> park and foliose red seaweeds on moderately exposed infralittoral rock	3, 27, 33, 47
LhypGz.Ft	Grazed <i>Laminaria hyperborea</i> forest with coralline crusts on upper infralittoral rock	7, 8, 9, 12, 13, 14, 15, 16, 18, 20, 31, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46,
LhypGz.Pk	Grazed <i>Laminaria hyperborea</i> park with coralline crusts on lower infralittoral rock	12, 31, 37, 39, 40, 42, 44, 46,
LhypLsac	Mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> on sheltered infralittoral rock	29, 34
XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock	7, 8, 9, 13, 16, 18, 21, 22, 29, 30, 35, 36
FoR	Foliose red seaweeds on exposed or moderately exposed lower infralittoral rock	30
Oph	<i>Ophiothrix fragilis</i> beds on slightly tide-swept circalittoral rock or mixed substrata	1, 2, 26, 29, 31, 33, 35, 36, 37, 39, 41, 43, 44, 46, 47,
AlcByH	<i>Alcyonium digitatum</i> and a bryozoan, hydroid and ascidian turf on moderately exposed vertical infralittoral rock	18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 34, 36, 37, 39, 46
AlcC	<i>Alcyonium digitatum</i> , <i>Pomatoceros triqueter</i> , algal and bryozoan crusts on vertical exposed circalittoral rock.	4, 22, 35, 37, 47
FaAIC	Faunal and algal crusts, <i>Echinus esculentus</i> , sparse <i>Alcyonium digitatum</i> and grazing-tolerant fauna on moderately exposed circalittoral rock.	2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47
FaAIC.Abi	Faunal and algal crusts, <i>Echinus esculentus</i> , sparse <i>Alcyonium digitatum</i> , <i>Abietinaria abietina</i> and other grazing-tolerant fauna on moderately exposed circalittoral rock.	5, 7, 29, 35
CGS	Circalittoral gravel and sand	8, 12, 13, 14, 15, 16, 18, 22, 24, 25, 27, 28, 29, 30, 32, 38, 45

APPENDIX 4

SPECIES LIST

MCS Code letter	MCS Code No	Species	Common name	Sites
Porifera				
C	11	<i>Clathrina coriacea</i>		18, 22
C	93	<i>Leuconia nivea</i>		22
C	416	<i>Suberites carnosus</i>		18
C	651	<i>Halichondria panicea</i>	Bread-crumble sponge	18, 22, 27, 28
C	758	<i>Esperiopsis fucorum</i>		22
Cnidaria				
D	11	<i>Haliclystus auricula</i>		21,
D	45	<i>Cyanea lamarckii</i>		4, 16, 23, 24, 29
D	48	<i>Aurelia aurita</i>		2, 28
D	390	<i>Halecium sp</i>		4, 15
D	392	<i>Halecium halecinum</i>		7, 9, 22, 29, 32, 38, 41, 44, 45
D	409	<i>Abietinaria abietina</i>		5, 22, 28, 35
D	434	<i>Sertularia argentea</i>		22
D	454	<i>Kirchenpaueria pinnata</i>		7, 22
D	463	<i>Nemertesia antennina</i>		10, 15
D	469	<i>Plumularia setacea</i>		2, 7
D	472	<i>Polyplumaria frutescens</i>		22
D	517	<i>Obelia geniculata</i>		1, 5, 10, 15, 18, 21, 22, 25, 28, 29, 32, 34, 35, 37, 38, 40, 41, 43, 44
D	517	<i>Obelia sp.</i>		18
D	597	<i>Alcyonium digitatum</i>	Dead men's fingers	1, 2, 4, 5, 6, 7, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47
D	632	<i>Cerianthus lloydii</i>		10, 12, 14, 28
D	681	<i>Bolocera tuediae</i>		2, 29
D	683	<i>Urticina eques</i>		4, 22, 42, 43
D	684	<i>Urticina felina</i>	Dahlia anemone	1, 2, 4, 5, 6, 9, 22, 28, 29, 31, 32, 34, 35, 36, 37, 38, 40, 42, 43, 44, 45, 46,
D	710	<i>Metridium senile</i>	Plumose anemone	5, 6, 10, 12, 18, 20, 22, 23, 26, 29, 34, 35, 36, 42
D	713	<i>Sagartia elegans</i>		2, 5, 6, 7, 12, 18, 20, 22, 24, 26, 34, 35, 36, 41, 45, 47
D	743	<i>Adamsia carciniopados</i>		6, 8, 18, 22, 25, 26, 29
D	783	<i>Caryophyllia smithii</i>	Devonshire cup coral	5, 35, 44, 45, 46
Ctenophora				
E	6	<i>Pleurobrachia pileus</i>		2, 46
Nemertea				
G	50	<i>Lineus sp.</i>	Ribbon worm	4, 10, 30
Annelida				
P	814	<i>Chaetopterus variopedatus</i>		5, 15, 28
P	931	<i>Arenicola marina</i>	Lugworm	42
P	1179	Terebellidae sp.	Strawberry worm	6
P	1195	<i>Lanice conchilega</i>	Sand mason	2, 4, 10, 15, 28, 38, 42, 46
P	1300	<i>Myxicola infundibulum</i>		2, 8
P	1320	<i>Sabella pavonina</i>	Peacock worm	2, 15, 29, 45

MCS Code letter	MCS Code No	Species	Common name	Sites
P	1339	<i>Pomatoceros</i> sp.	Keelworm	1, 4, 7, 8, 9, 10, 14, 15, 16, 18, 20, 21, 22, 25, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 40, 41, 43, 44, 45, 47
P	1396	<i>Spirorbidae</i> indet.		18, 41,
Chelicerata				
Q	49	<i>Pycnogonidae</i> indet.		5, 21, 28, 35, 45
Crustacea				
R	74	<i>Balanidae</i> indet	Barnacle	2, 4, 9, 10, 16, 18, 21, 25, 28, 30, 32, 35, 42, 43, 46
R	76	<i>Balanus balanus</i>		7, 22, 47
R	77	<i>Balanus crenatus</i>		7, 15, 22
S	31	<i>Mysidae</i> idet		6, 7
S	639	<i>Caprellidae</i> indet		16, 18
S	1385	<i>Crangon crangon</i>		7, 22, 29,
S	1400	<i>Homarus gammarus</i>	Common lobster	10, 15, 16, 21, 22, 23, 24, 26, 29, 38, 42
S	1445	<i>Paguridae</i> sp.	Hermit crab	2, 5, 6, 21, 27, 28, 30, 32, 35, 37, 42, 46, 47
S	1448	<i>Anapagurus hyndmanni</i>		7
S	1457	<i>Pagurus bernhardus</i>	Hermit crab	1, 4, 7, 9, 15, 22, 31, 40, 41, 44, 45
S	1462	<i>Pagurus prideaux</i>		6, 8, 18, 22, 25, 29
S	1470	<i>Galathea</i> sp	Squat lobster	2, 3, 4, 8, 14, 15, 32, 41, 45, 46
S	1471	<i>Galathea dispersa</i>	Squat lobster	47
S	1472	<i>Galathea intermedia</i>	Squat lobster	7, 21, 42
S	1476	<i>Galathea strigosa</i>	Squat lobster	4, 12, 16, 18, 20, 22, 25, 29, 34, 37, 38, 41, 42, 43, 44, 45, 47
S	1478	<i>Munida rugosa</i>	Long-clawed squat lobster	1, 4
S	1482	<i>Pisidia longicornis</i>	Long-clawed porcelain crab	44
S	1518	<i>Hyas araneus</i>	Spider crab	42
S	1525	<i>Inachus</i> sp.		4, 10
S	1526	<i>Inachus dorsettensis</i>	Scorpion spider crab	7
S	1552	<i>Corystes cassivelaunus</i>		15
S	1566	<i>Cancer pagurus</i>	Edible crab	2, 3, 4, 5, 10, 12, 16, 18, 20, 21, 22, 23, 24, 25, 27, 28, 34, 35, 37, 38, 41, 42, 43, 44, 46, 47
S	1580	<i>Liocarcinus depurator</i>	Harbour crab	1, 2, 4, 6, 7, 15, 16, 29, 30, 41, 42, 45
S	1589	<i>Necora puber</i>	Velvet swimming crab	1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 16, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 32, 34, 35, 37, 38, 41, 42, 43, 44, 45, 46, 47
S	1594	<i>Carcinus maenas</i>	Common shore crab	7, 10, 22, 46
Mollusca				
W	163	<i>Gibbula cineraria</i>	Grey top shell	6, 8, 9, 10, 12, 15, 16, 18, 21, 22, 24, 25, 28, 29, 31, 32, 35, 37, 38, 43, 45
W	182	<i>Calliostoma zizyphinum</i>	Painted top shell	4, 12, 21, 23, 30, 32, 38, 42, 44, 46
W	234	<i>Helcion pellucidum</i>	Blue-rayed limpet	16, 21, 35
W	292	<i>Lacuna vincta</i>		16
W	324	<i>Rissoidae</i> indet		21
W	461	<i>Trivia monacha</i>	Cowrie	20, 21, 35, 37, 44
W	708	<i>Buccinum undatum</i>	Common whelk	4, 7, 22, 45, 47
W	745	<i>Hinia reticulata</i>	Netted whelk	32, 47
W	1250	<i>Tritonia hombergii</i>		6
W	1270	<i>Doto</i> sp.		9, 21

MCS Code letter	MCS Code No	Species	Common name	Sites
W	1349	<i>Polycera faeroensis</i>		28, 35
W	1350	<i>Polycera quadrilineata</i>		21, 44
W	1354	<i>Limacia clavigera</i>		14, 16
W	1376	<i>Archidoris pseudoargus</i>	Sea lemon	18
W	1424	<i>Flabellina pedata</i>		6
W	1467	<i>Facelina</i> sp.		5
W	1695	<i>Mytilus edulis</i>	Mussel	22
W	1702	<i>Modiolus modiolus</i>		2, 6,
W	1771	<i>Pecten maximus</i>	King scallop	2, 15, 28
W	1773	<i>Aequipecten opercularis</i>	Queen scallop	4, 10, 15,
W	1805	<i>Anomiidae</i> indet	Saddle oyster	2, 4, 5, 6, 9, 18, 28, 30, 38, 44, 45
W	1814	<i>Pododesmus patelliformis</i>		7, 22, 35, 37, 41, 47
W	1998	<i>Ensis</i> sp.	Razor shell	2, 4, 26, 28, 46
W	2144	<i>Mya</i> sp.		6, 15, 22
W	2329	? <i>Sepiola atlantica</i>		10
W	2398	<i>Eledone cirrhosa</i>	Curled octopus	6, 7, 16, 20, 22, 29, 34
Bryozoa				
Y	170	<i>Membranipora membranacea</i>	Hornwreck	5, 9, 16, 18, 21, 22, 23, 28, 29, 34, 35, 37, 40, 41, 42, 44, 46
Y	178	<i>Electra pilosa</i>		5, 28, 35
Echinodermata				
ZB	72	<i>Solaster endeca</i>	Sun star	27
ZB	75	<i>Crossaster papposus</i>	Purple sunstar	2, 3, 4, 5, 6, 10, 12, 14, 16, 20, 22, 23, 24, 26, 28, 29, 31, 34, 35, 36, 37, 38, 39, 43, 44, 45, 46
ZB	83	<i>Henricia</i> sp.	Bloody henry	4, 6, 34, 35, 40, 41, 45, 47
ZB	100	<i>Asterias rubens</i>	Common starfish	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47
ZB	104	<i>Marthasterias glacialis</i>	Spiny starfish	30
ZB	124	<i>Ophiothrix fragilis</i>	Brittle star	1, 2, 5, 6, 7, 12, 28, 29, 31, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47
ZB	128	<i>Ophiocomina nigra</i>	Black brittle star	1, 2, 5, 6, 7, 8, 22, 28, 29, 30, 31, 36, 38, 40, 41, 44, 45, 46, 47
ZB	147	<i>Ophiopholis aculeata</i>		20, 40
ZB	161	<i>Amphipholis squamata</i>		4
ZB	168	<i>Ophiura albida</i>	Brittle star	2, 7, 14, 15, 18, 22, 29, 38, 41, 43, 44, 45, 47
ZB	170	<i>Ophiura ophiura</i>		5, 28, 35,
ZB	193	<i>Psammechinus miliaris</i>	Green sea urchin	38, 41, 42
ZB	198	<i>Echinus esculentus</i>	Common sea urchin	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47
Tunicata				
ZD	7	<i>Clavelina lepadiformis</i>	Light-bulb ascidian	6, 7, 9, 10, 18, 22, 26, 28, 32, 37, 40, 41, 42, 43, 44, 45, 47
ZD	40	<i>Aplidium punctum</i>		9
ZD	41	<i>Didemnidae</i> indet		18
ZD	54	<i>Didemnum maculosum</i>		7
ZD	65	<i>Lissoclinum perforatum</i>		22,
ZD	71	<i>Ciona intestinalis</i>		4, 7, 8, 26, 37, 40, 41, 43, 44, 46, 47
ZD	81	<i>Corella parallelogramma</i>		18, 22, 44, 45
ZD	85	<i>Ascidella scabra</i>		22

MCS Code letter	MCS Code No	Species	Common name	Sites
ZD	89	<i>Ascidia mentula</i>		22
ZD	126	<i>Botryllus schlosseri</i>		18
ZD	128	<i>Botrylloides leachi</i>		20
Pisces				
ZG	94	<i>Lophius piscatorius</i>	Anglerfish	25, 44
ZG	17	<i>Conger conger</i>	Conger eel	14
ZG	116	<i>Gadus morhua</i>	Cod	38, 43
ZG	129	<i>Molva molva</i>	Ling	10, 18
ZG	135	<i>Pollachius pollachius</i>	Pollack	10, 14, 22, 23, 24, 25, 27, 28, 32, 34, 35, 38, 46, 47
ZG	136	<i>Pollachius virens</i>	Saithe	1, 5, 12, 15, 16, 23, 26
ZG	281	<i>Myoxocephalus scorpioides</i>	Bull rout	22, 41
ZG	283	<i>Taurulus bubalis</i>	Sea scorpion	6, 9, 16, 20, 37, 43, 47
ZG	390	<i>Centrolabrus exoletus</i>	Rock cook	16
ZG	395	<i>Crenilabrus melops</i>	Corkwing	12, 22
ZG	397	<i>Ctenolabrus rupestris</i>	Goldsinny wrasse	10, 16, 18, 20, 25, 26, 34, 38
ZG	399	<i>Labrus bergylta</i>	Ballan wrasse	3, 7, 9, 12, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 29, 32, 34, 38, 41, 42, 45, 46
ZG	400	<i>Labrus mixta</i>	Cuckoo wrasse	16, 23, 30
ZG	418	<i>Anarhichas lupus</i>	Wolf fish	43
ZG	440	<i>Pholis gunnellus</i>	Butterfish, gunnel	2, 6, 10, 14, 15, 22, 25, 37, 41, 43, 44, 46, 47
ZG	442	<i>Ammodytes sp.</i>	Sand eel	7
ZG	452	<i>Callionymus lyra</i>	Dragonet	1, 6, 30
ZG	470	<i>Gobiusculus flavescens</i>	Two spotted goby	7, 28
ZG	479	<i>Pomatoschistus sp.</i>	Sand goby	2, 4, 5, 6, 7, 9, 10, 12, 14, 15, 16, 22, 25, 26, 28, 32, 34, 38, 45, 46, 47
ZG	483	<i>Thorogobius ephippiatus</i>	Leopard spotted goby	10, 15
ZG	558	<i>Zeugopterus punctatus</i>	Norwegian topknot	6, 22, 24, 27, 43, 44, 45, 47
ZG	606	<i>Mola mola</i>	Sun fish	26
Rhodophycota				
ZM	1	Enc. Dark red algae		7, 43
ZM	72	? <i>Audouinella sp.</i>		7
ZM	146	<i>Bonnemaisonia asparagoides</i>		7
ZM	170	<i>Palmaria palmata</i>	Dulse	25
ZM	194	Enc. Corallinaceae sp.	Enc. coralline algae	2, 4, 7, 8, 9, 10, 15, 21, 22, 25, 26, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47
ZM	372	<i>Kallymenia reniformis</i>		21
ZM	443	<i>Plocamium cartilagineum</i>		7, 8, 9, 18, 21, 22, 25, 29, 42
ZM	592	<i>Cryptopleura ramosa</i>		5, 9, 22, 29, 38,
ZM	594	<i>Delesseria sanguinea</i>	Sea beech	7, 8, 15, 21, 22, 25, 31, 32, 42, 47
ZM	612	<i>Membranoptera alata</i>		15
ZM	616	<i>Phycodrys rubens</i>		16, 22, 29, 31, 38
ZM	649	<i>Odonthalia dentata</i>		22
Chromophycota				
ZR	1	Enc. Brown algae		7, 37
ZR	313	<i>Dictyota dichotoma</i>		7
ZR	334	<i>Desmarestia aculeata</i>		5, 7, 8, 10, 18, 21, 22, 25, 28, 29, 34, 35, 38, 40, 41, 42, 43
ZR	336	<i>Desmarestia ligulata</i>		5

MCS Code letter	MCS Code No	Species	Common name	Sites
ZR	337	<i>Desmarestia viridis</i>		18, 22, 30
ZR	341	<i>Alaria esculenta</i>	Dabberlocks	7, 8, 18, 21, 25, 28, 29, 30, 31
ZR	350	<i>Laminaria digitata</i>		1, 21, 28, 30, 35, 40
ZR	351	<i>Laminaria hyperborea</i>	Cuvie	5, 7, 8, 9, 10, 18, 21, 22, 25, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 46, 47
ZR	354	<i>Laminaria saccharina</i>	Sugar kelp	7, 21, 22, 36
ZR	359	<i>Saccorhiza polyschides</i>		7, 18, 21, 25, 29, 35, 36, 38
Chlorophycota				
ZS	149	<i>Enteromorpha sp.</i>		38
ZS	179	<i>Ulva lactuca</i>	Sea lettuce	7, 9, 18, 21, 22, 25, 26, 28, 29, 30, 35, 42