

The Maidens Survey Report May 2006 — May 2009

Report from the Sublittoral Survey
Northern Ireland Survey Project



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Northern Ireland Survey Project

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The opinions expressed in this report do not necessarily reflect the current opinion or policy of the Northern Ireland Environment Agency.

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Introduction

The Maidens are a group of rocks 5 miles NE of Larne on the east coast of Northern Ireland. There are two small islands, East Maiden and West Maiden and several partially submerged or submerged rock pinnacles, of which Allen's Rock and the Highlandman are the largest. The group is situated on a plateau approximately 20-40m in depth which is much shallower than the surrounding seabed. Immediately east of the plateau depths reach up to 200m and towards the south and west up to 80m. The Maidens are exposed to the full flow of the North Channel tidal stream, up to 2.5 knots at spring tide. However, as the tide rises over the plateau it results in eddies and overfalls and consequently in some areas the resultant flow is much stronger (estimated up to 4 knots). Under the Marine Nature Conservation Review (MNCR) exposure scale they are classified as 'Moderately exposed', being partly sheltered from the prevailing westerly winds and having their longest fetch down the North Channel. There are two notable large pinnacles offshore of the Maidens which have been included in this study. These are 'Pinnacle East of the Maidens' and 'Annika's pinnacle' to the North-east of the main group (Figure 1).

The Maidens were recognised during the 1982-86 Northern Ireland Sublittoral Survey (Erwin et al. 1986,1990) as an area of high biological importance. There are a wide range of habitats present, from bedrock and boulder to sand. They are important in a Northern Ireland context as the hydrographic conditions result in the presence of a suite of deeper water species, only known from here and Rathlin Island. Elsewhere in the UK the same suite of species has only been found at a few sites in the Sound of Jura. These include a hydroid assemblage of *Polyplumaria flabellata* and *Diphasia alata* and a community of deeper water sponges. During the Sublittoral Survey Northern Ireland Project (Goodwin et al. 2011) the area was found to be a stronghold for several Northern Ireland Conservation Priority species, one of the findings of the Sublittoral Survey Northern Ireland (SSNI) project was that the Maidens be considered for higher level protection, possibly to include designation as a European Special Area of Conservation (SAC).

Project Aims

The aims of the survey were to record the species and habitats present in this area and using the results from the survey identify sites, species and habitats of particular scientific interest and conservation importance. Whilst the area had been surveyed during the Northern Ireland Sublittoral Survey (Erwin et al. 1986, 1990) only 25 survey dives had been undertaken on the main Maidens group. The Maidens have been proposed as a potential Special Area of Conservation (SAC), this report will contribute towards assessing their suitability as an SAC against European selection criteria. This work will also serve as valuable groundtruthing for a bathymetric survey currently being conducted by Agri-Food and Biosciences Institute (AFBI).

Methodology

This report combines data collected on the Sublittoral Survey Northern Ireland project (Goodwin et al. 2011), a survey targeting Northern Ireland Conservation Priority Species; and the results of four weeks fieldwork carried out in summer 2008 targeting the Maidens. In total 94 survey dives were carried out during 2006-2008 on the Maidens group and outlying pinnacles. These covered 76 different sites, with information on one additional site (Pinnacle East of the Maidens) being obtained from Northern Ireland Sublittoral Survey (NISS) data. Additional information on species and habitats was incorporated from the Northern Ireland Sublittoral Survey (Erwin et al. 1986,1990) and Seasearch survey dives carried out by volunteer divers (Goodwin 2007). Dives (including NISS and Seasearch dives) are shown in Figure 2 and a table of dives (2006-2008) is given in Appendix 1.

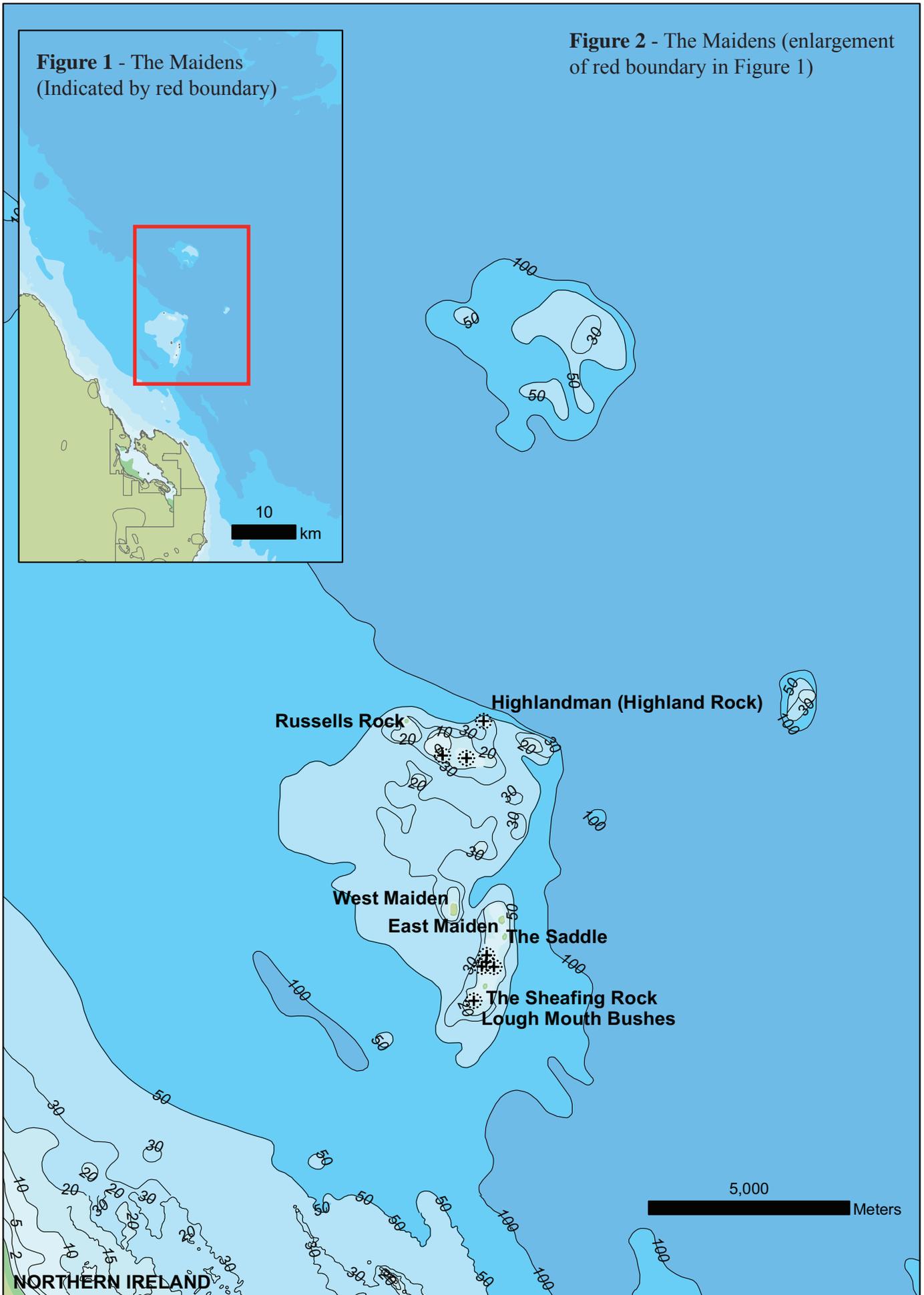
Divers were experienced field biologists with good knowledge of *in situ* identification. Surveyors were Claire Goodwin, Bernard Picton (National Museums Northern Ireland), Joe Breen, Hugh Edwards, Trevor Harrison (Northern Ireland Environment Agency), Paulo Pizzolla (JNCC), and Lin Baldock, Francis Bunker, Jen Jones, and Jon Moore (employed as contractors).

The areas were surveyed by SCUBA diving. Approximately 30 minutes was spent recording on each dive. Dive time was limited by decompression constraints so actual time varied from around 20 minutes on the deepest sites surveyed to up to an hour on the shallowest. Conspicuous flora and fauna was noted and specimens collected where *in situ* identification was not possible. MNCR phase 2 sublittoral habitat forms were completed to give a record of species and habitats at each site and on most dives photos or video was taken. Recording was consistent with MNCR guidelines, with species abundances recorded using the SACFOR scale (see Hiscock (1996) for detailed methods). A pair of divers was deployed on all dives. Specimens are held in the Ulster Museum collections.

Data from the surveys was entered onto Marine Recorder by Julia Nunn of the Centre for Environmental Data and Recording (CEDaR). An additional database of all photos and specimens was compiled on Microsoft Access (the Sublittoral Survey Northern Ireland database). This information is searchable by species and dive number. Copies of this are held by National Museums Northern Ireland and the Northern Ireland Environment Agency.

Figure 1 - The Maidens
(Indicated by red boundary)

Figure 2 - The Maidens (enlargement
of red boundary in Figure 1)



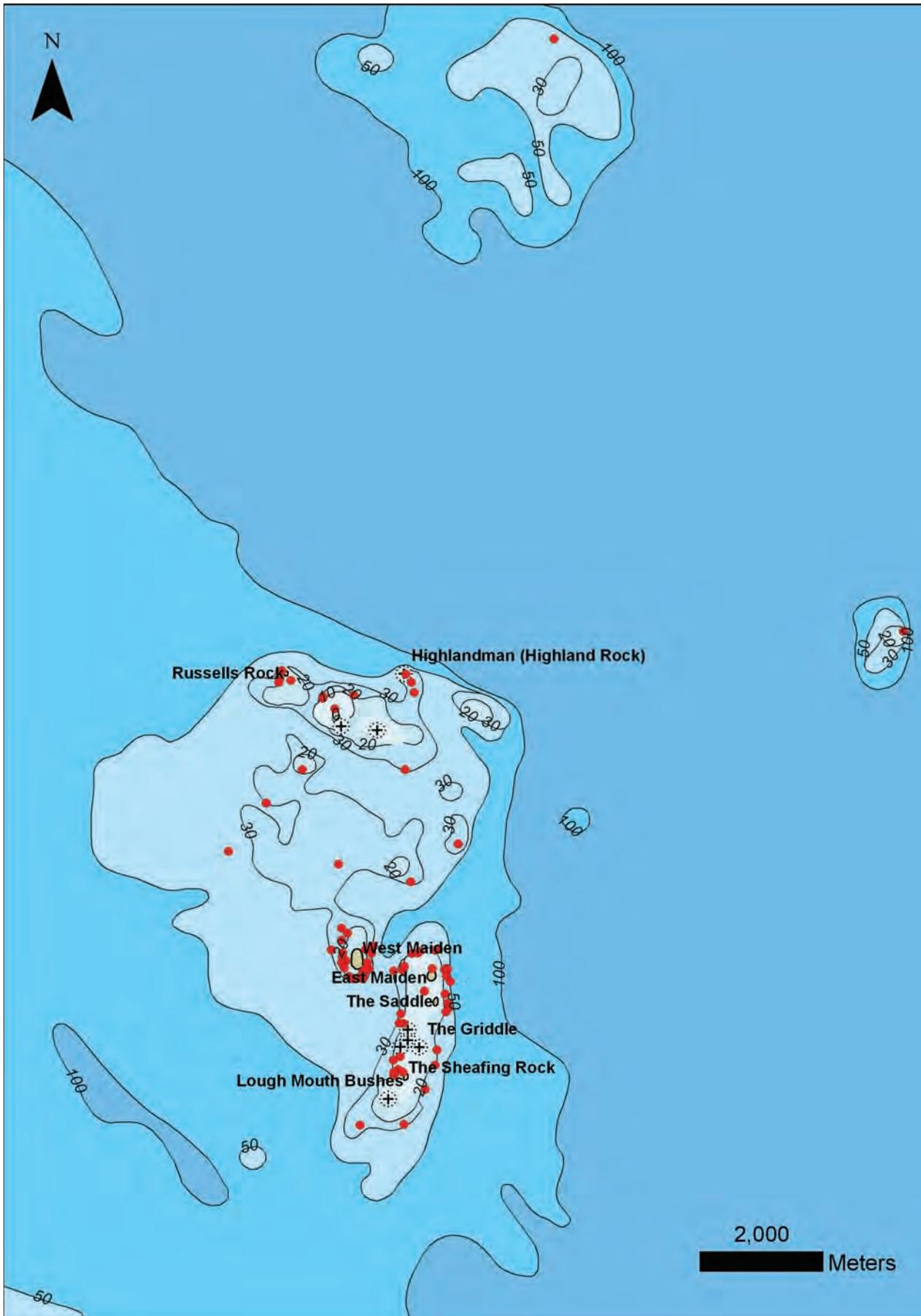


Figure 3 - Dive sampling sites ●

Results

Habitat Types – Key Biotopes

The habitats present at the Maidens can be divided into nine key habitats. An attempt has been made to equate these to JNCC biotopes as defined in Connor et al. (2004), where this is the case the existing biotope description is given. However, some biotopes/sub-biotopes are present, notably Habitats 4 and 5, which do not match any existing descriptions. The hydrographic conditions present and the proximity of deep water to the plateau result in conditions not found in many other UK areas and consequently these habitats are extremely rare. The biotopes present are largely governed by the tidal exposure, outlying areas are more exposed as they are not sheltered by other rocks or islets. Habitats 1-3 represent points along a continuum of tidal exposure, with 1 being the most and 3 the least exposed.



Figure 4 - Habitat 1 - *Tubularia indivisa* and *Corynactis viridis* in exposed locations. North of the Highlandman. Dive 080814/04

Habitat 1

Tubularia indivisa and *Corynactis viridis* in very tide swept locations

Tubularia indivisa and *Corynactis viridis* on very exposed, strongly tide-swept rock (e.g. the north face of the Highlandman). Dense turf of *Tubularia indivisa* (abundant) with *Caryophyllia smithii*, *Alcyonium digitatum*, *Actinothoe sphyrodeta*, *Sagartia elegans*, Encrusting sponges, *Crisia* and *Cellaria* spp. Large patches of *Corynactis viridis* present.

This habitat is located on the outer extremities of the Maidens group in areas on the edge of the plateau which are exposed to extremely strong tidal stream. Species diversity is lower than at less exposed sites.

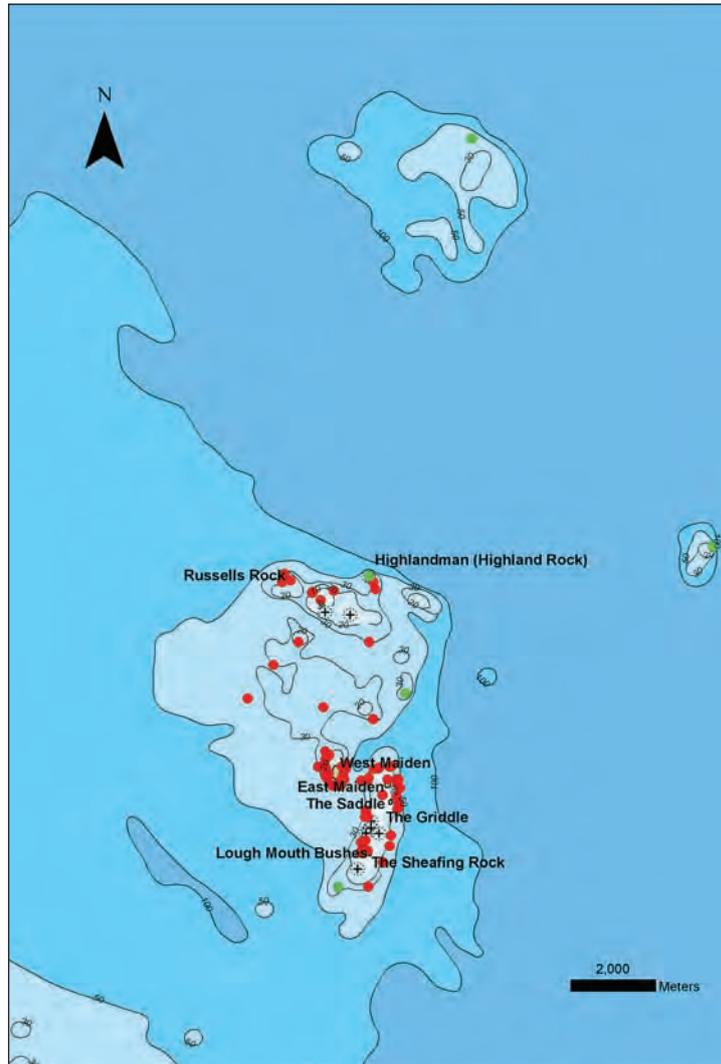


Figure 5 - Habitat 1 ●, Other sampling sites ●

Equates to the JNCC Biotope '*Tubularia indivisa* on tide-swept circalittoral rock – CR.HCR.FaT.CTub'

'This biotope is typically found on the vertical and upper faces of strongly tide-swept, wave-exposed circalittoral bedrock and boulders. It is characterised by a dense carpet of the robust hydroid *Tubularia indivisa*. The barnacle *Balanus crenatus*, where present, is recorded as common. The accompanying species in the community are determined by tidal stream strength. On the more sheltered sides of headlands, where tidal streams are accelerated, sponges such as *Pachymatisma johnstonia*, *Esperiopsis fucorum*, *Myxilla incrustans* and *Halichondria panicea* proliferate forming the CTub.CuSp sub-biotope. There may also be a scattered bryozoan turf, formed by criisid bryozoans. However, where tidal streams are slightly reduced, but on more wave-exposed coasts, anthozoans such as *Alcyonium digitatum* become more prominent forming the CTub.Adig biotope. Other species recorded in this biotope include the anemones *Sagartia elegans*, *Actinothoe sphyrodeta*, *Corynactis viridis* and *Urticina felina*. There may be scattered clumps of hydroids such as *Sertularia argentea* and *Nemertesia antennina*. Where 'relative shelter' is afforded by the topography of the seabed, the bryozoans *Flustra foliacea*, *Alcyonidium diaphanum* and the crab *Cancer pagurus* may be found. More ubiquitous species such as *Asterias rubens* and *Calliostoma zizyphinum* may also be present' (Connor et al. 2004).

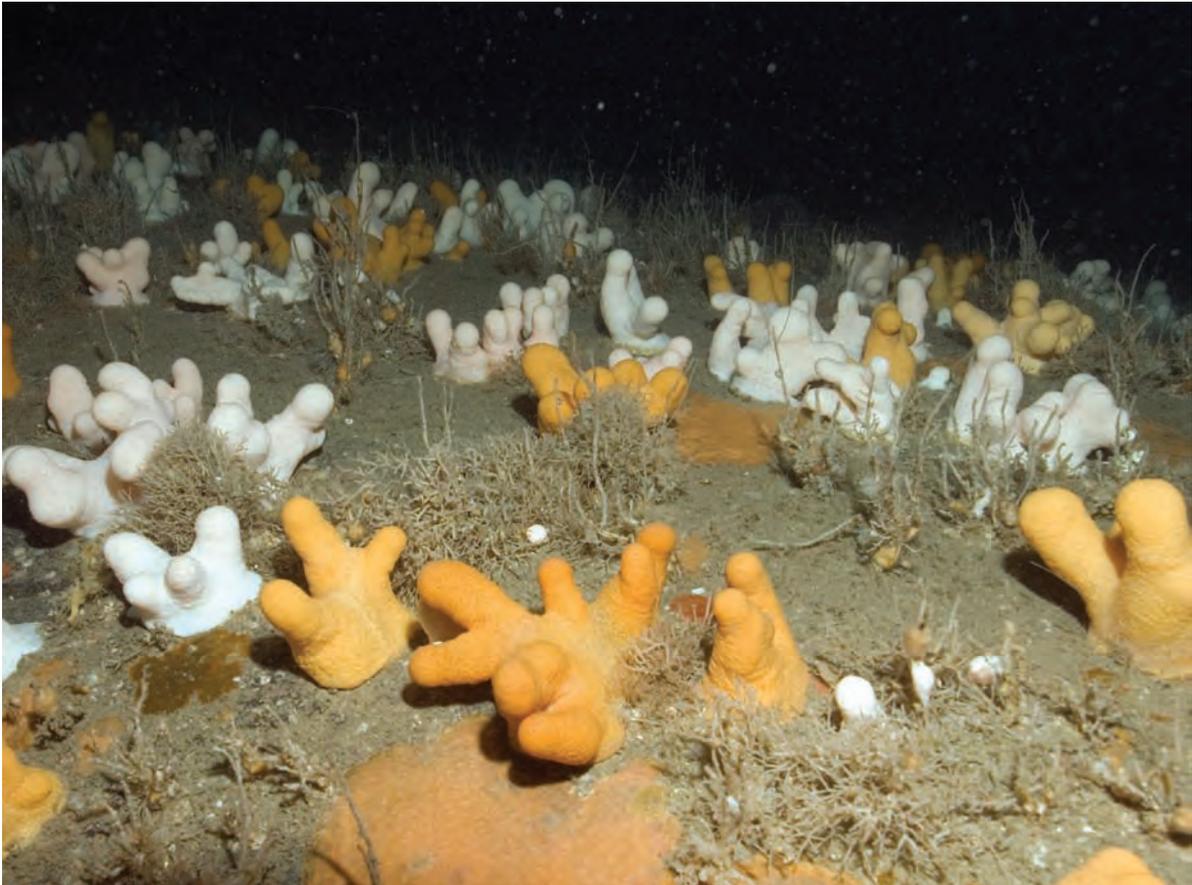


Figure 6 - Habitat 2 - *Tubularia indivisa* and *Alcyonium digitatum*. 080813/01 NW of West Maiden

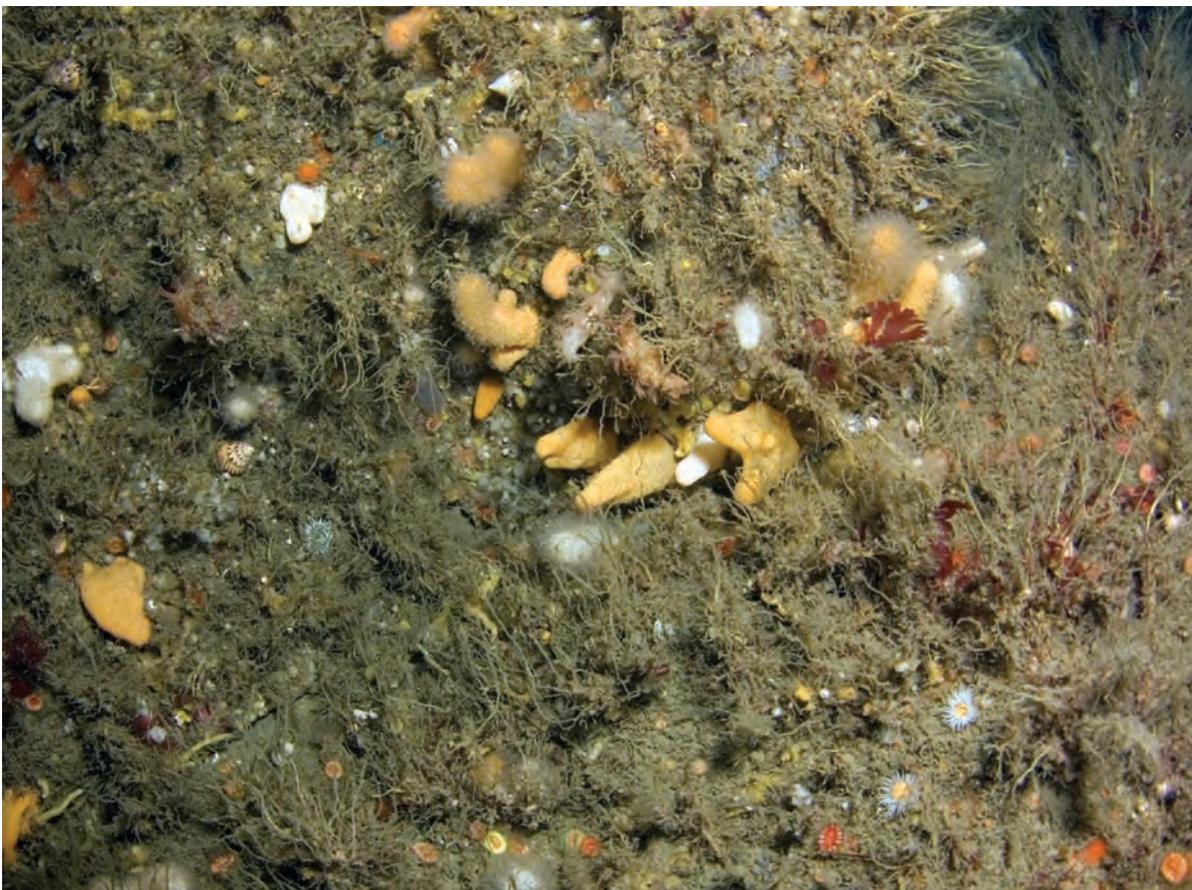


Figure 7 - Habitat 2 - *Tubularia indivisa* and *Alcyonium digitatum*. 080620/03 Pinnacle between Maidens and Allen's Rock.

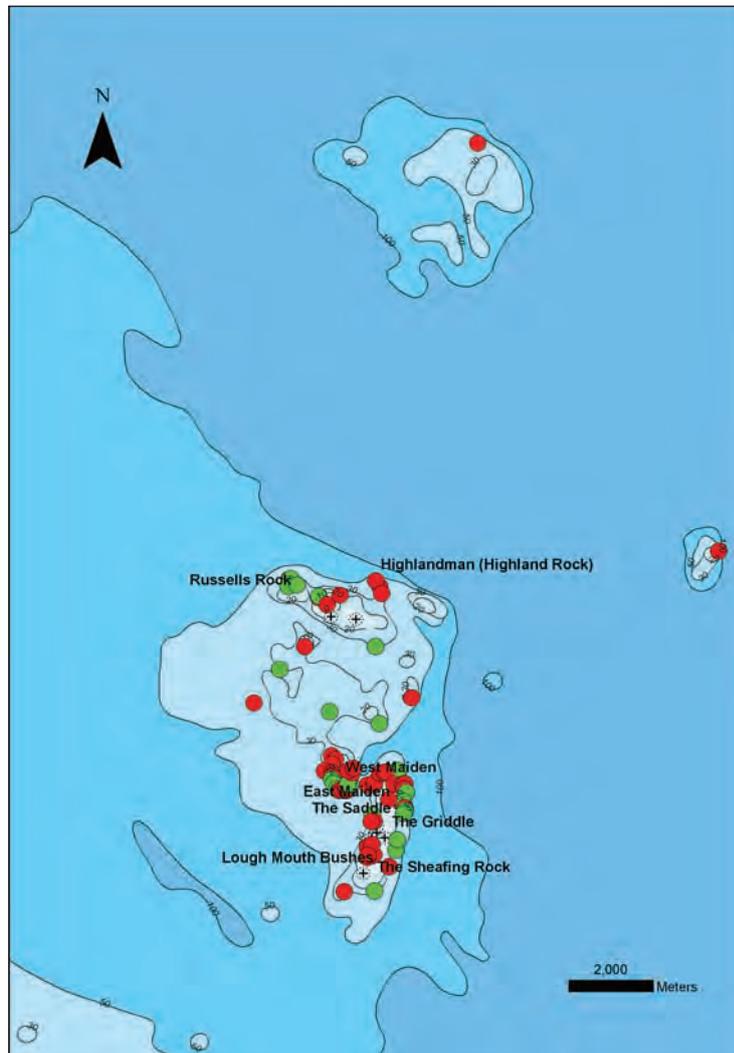


Figure 8 - Habitat 2 (green circle), Other sampling sites (red circle)

Habitat 2

Tubularia indivisa and *Alcyonium digitatum* in tide swept locations

Tide-swept boulders or bedrock dominated by *Tubularia indivisa* and *Alcyonium digitatum*. Other hydroids such as *Nemertesia antennina*, *N. ramosa* and *Aglaophenia tubulifera* may be occasional but species much less diverse than in Habitat 3. The cup coral *Caryophyllia smithii* is abundant and the anemone *Actinothoe sphyrodeta* common. The habitat can look quite patchy with urchin grazed bare areas and large patches of the bryozoan *Parasmittina trispinosa*. In deeper bedrock areas on overhangs and on the undersides of boulders the anemone *Parazoanthus anguicomus* is often present, sometimes common or frequent.

The closest JNCC biotope to this is CR.HCR.FaT.CTub.Adig but this local variant probably should be categorised as a sub biotope. It is unusual for *Tubularia indivisa* to occur in such deep water, probably this is due to the strong tides present in this area. Consequently *Parazoanthus anguicomus*, which tends occur only in the lower infralittoral and circalittoral in Northern Ireland, occurs with it. It is present in areas which are slightly less current exposed than Habitat 1.

‘*Alcyonium digitatum* with dense *Tubularia indivisa* and anemones on strongly tide-swept circalittoral rock CR.HCR.FaT.CTub.Adig’

This variant is typically found on exposed circalittoral bedrock and boulders in sounds, narrows and around tide-swept promontories in accelerated tidal streams. It is dominated by aggregations of dead man’s fingers *Alcyonium digitatum*, and dense clumps or continuous cover of the robust hydroid *Tubularia indivisa*, particularly on prominent ledges and ridges. Anemones such as *Sagartia elegans*, *Urticina felina*, *Metridium senile*, *Actinothoe sphyrodeta* and *Corynactis viridis* form a prominent component of the community. Occasionally, massive sponges such as *Pachymatisma johnstonia* and *Esperiopsis fucorum* may be present.



Figure 9 - Habitat 3 - Massive and encrusting sponges with *Alcyonium digitatum*, mixed hydroids and bryozoans. 080617/02 Mound North-East of Allen Rock.

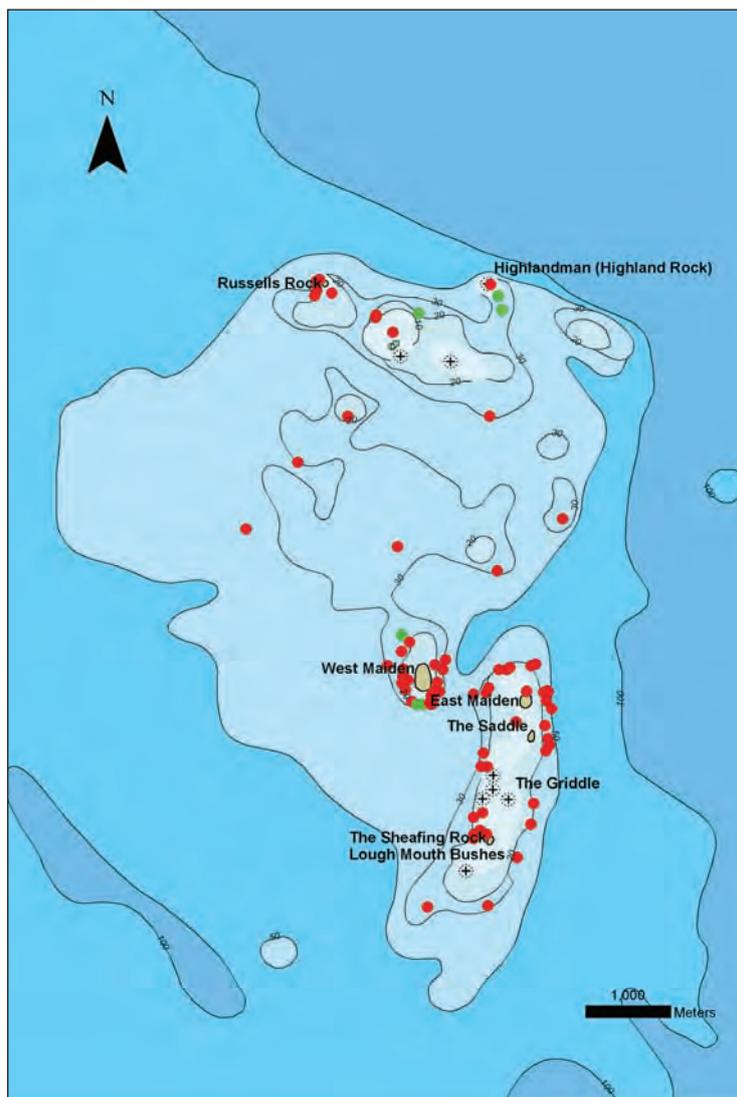


Figure 10 - Habitat 3 ●, Other sampling sites ●

Encrusting species such as the polychaete *Pomatoceros triqueter* and the barnacle *Balanus crenatus* may be dotted around the rocks, and the top shell *Calliostoma zizyphinum* may also be observed. Clumps of the bryozoan *Flustra foliacea* are occasionally seen. The starfish *Asterias rubens* may be seen amongst a patchy turf of *Crisia denticulata* and the bryozoan *Alcyonidium diaphanum*. This variant may also be found on tideswept wrecks and other artificial substratum'. (Connor et al. 2004).

Habitat 3

Massive and encrusting sponges with *Alcyonium digitatum*, mixed hydroids and bryozoans

Bedrock or boulders dominated by *Alcyonium digitatum* and a mixed faunal turf of hydroids and bryozoans (*Nemertesia* spp, *Tubularia indivisa* (but only occasional, not dominant as in above biotopes)), bryozoans (*Alcyonidium diaphanum*, crisiid turf, *Cellaria* spp, encrusting species), sponges (encrusting and massive), and anemones (*Corynactis viridis*, *Actinothoe sphyrodeta*). It differs from Habitats 1 and 2 in that *Tubularia indivisa* is not dominant, where present it only occurs in low abundances. It differs from habitat 4 in that whilst some sponges are present they occur in much lower numbers and the sponge *Axinella infundibuliformis* is not common, though may be present in small numbers. Most sites were within the 25-35m depth range and exposed to moderate tidal streams. This habitat is equivalent to the CR.HCR.XFa.BrErSp biotope.

'Bryozoan turf and erect sponges on tide-swept circalittoral rock, CR.HCR.XFa.ByErSp

This biotope is typically found on wave-exposed circalittoral bedrock or boulders subject to tidal streams ranging from moderately strong to strong. It often has a thin layer of silt covering the seabed, and is characterised by a bryozoan/hydroid turf with erect sponges. Typical bryozoans to be found include crisiids, *Alcyonidium diaphanum*, *Flustra foliacea*, *Pentapora foliacea*, *Bugula plumosa* and *B. flabellata*, while typical hydroids include *Nemertesia antennina*, *N. ramosa* and *Halecium halecinum*. The soft coral *Alcyonium digitatum* is frequently recorded on the tops of boulders and rocky outcrops. Characteristic erect sponges include *Raspailia ramosa*, *Stelligera stuposa* and *S. rigida*; other sponges present include *Cliona celata*, *Dysidea fragilis*, *Pachymatisma johnstonia*, *Polymastia boletiformis*, *Hemimycale columella*, *Esperiopsis fucorum*, *Polymastia mamillaris* and *Tethya aurantium*. Other species present include *Caryophyllia smithii*, *Actinothoe sphyrodeta*, *Corynactis viridis*, *Urticina felina*, *Balanus crenatus*, *Asterias rubens*, *Marthasterias glacialis*, *Henricia oculata*, *Echinus esculentus*, *Clavelina lepadiformis*, *Calliostoma zizyphinum* and *Necora puber*. Three variants of this biotope have been described, but all are characterised by a bryozoan turf with erect sponges. ByErSp.Eun is found primarily on circalittoral bedrock and is dominated by the seafan *Eunicella verrucosa*. ByErSp.DysAct is found under slightly stronger tide-swept conditions, and is characterised particularly by the sponge *D. fragilis* and the anemone *A. sphyrodeta*. Finally ByErSp.Sag is characterised by the anemone *Sagartia elegans*.' (Connor et al. 2004).

Habitat 4

Deeper water sponge community

This biotope occurs in deeper areas, typically >25m. It is out of the strongest tidal streams, and the bedrock is often covered in a fine layer of silt. *Caryophyllia smithii* is abundant or common. It is characterised by the presence of common or frequent *Axinella infundibuliformis* sponges and other massive sponges such as *Raspailia hispidata*, *Raspailia ramosa*, *Stelligera stuposa*, *Polymastia boletiformis* and *Haliclona viscosa*. Encrusting sponges are also common. The hydroid *Nemertesia antennina* is often frequent.

The closest biotope to this is CR.HCR.DpSp.PhaAxi, however the areas are subject to strong tidal streams (although less than the more exposed *Tubularia* dominated sites, Habitats 1 and 2). *Phakellia ventilabrum* is absent, this deep water species is typically found on the west coast of Scotland and Ireland. A new sub biotope should be designated.

'*Phakellia ventilabrum* and Axinellid sponges on deep, wave- exposed bedrock, CR.HCR.DpSp.PhaAxi'

This biotope typically occurs on the upper faces of deep (commonly below 30m depth), wave-exposed circalittoral rock subject to negligible tidal streams. Although it occurs in exposed and very exposed conditions, at such depth, the turbulent wave action appears to have a much-attenuated effect on the fauna compared with shallower depths. As the majority of records are from depths between 30-50+ m, slightly deeper than the depths of most surveys, it is possible that this biotope is more widespread than the available dataset indicates. The sponge component of this biotope is the most striking feature, with similar species to the bryozoan and erect sponge biotope complex (BrErSp) although in this case, the sponges *Phakellia ventilabrum*, *Axinella*



Figure 11 - Habitat 4 - Deeper Water Sponge Community. 080814/01, North-East of West Maiden

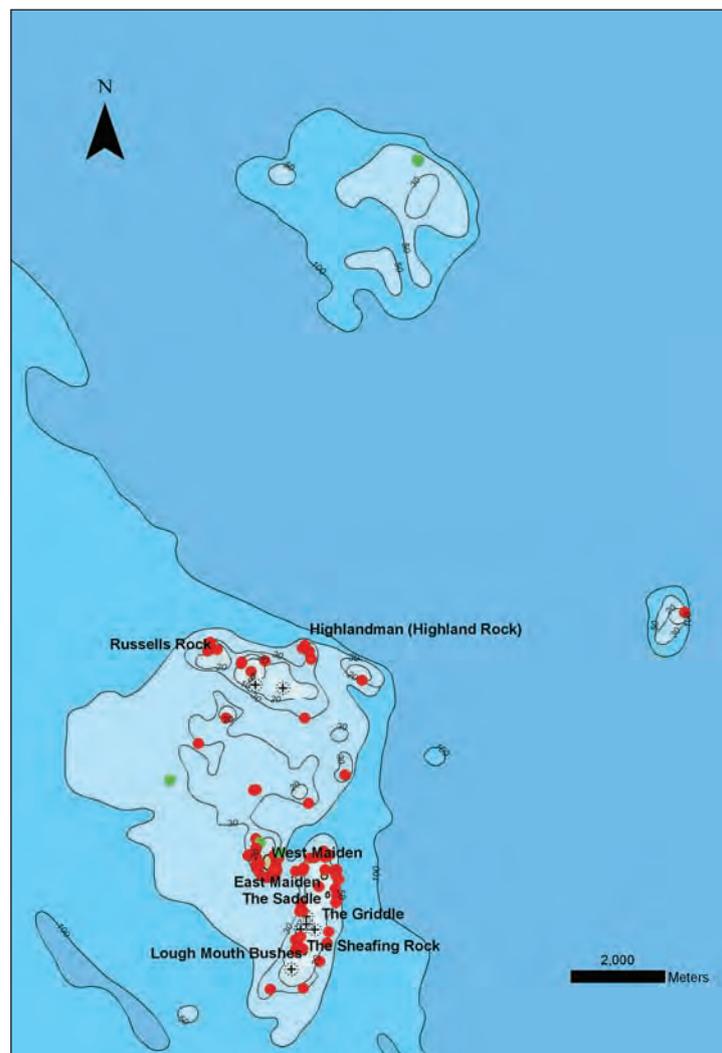


Figure 12 - Habitat 4 ●, Other sampling sites ●

infundibuliformis, *Axinella dissimilis* and *Stelligera stuposa* dominate. Other sponge species frequently found on exposed rocky coasts are also present in low to moderate abundance. These include *Cliona celata*, *Polymastia boletiformis*, *Haliclona viscosa*, *Pachymatisma johnstonia*, *Dysidea fragilis*, *Suberites carnosus*, *Stelligera rigida*, *Hemimycale columella* and *Tethya aurantium*. The cup coral *Caryophyllia smithii* and the anemone *Corynactis viridis* may be locally abundant in some areas, along with the holothurian *Holothuria forskali*. The soft corals *Alcyonium digitatum* and *Alcyonium glomeratum* are frequently observed. The bryozoans *Pentapora foliacea* and *Porella compressa* are also more frequently found in this deep-water biotope. Bryozoan crusts such as *Parasmittina trispinosa* are also occasionally recorded. Isolated clumps of large hydroids such as *Nemertesia antennina*, *Nemertesia ramosa* and *Sertularella gayi* may be seen on the tops of boulders and rocky outcrops. Large echinoderms such as *Echinus esculentus*, *Luidia ciliaris*, *Marthasterias glacialis*, *Stichastrella rosea*, *Henricia oculata* and *Aslia lefevrei* may also be present. The seafan *Eunicella verucosa* may be locally common but to a lesser extent than in ByErSp.Eun. The top shell *Calliostoma zizyphinum* is often recorded as present.’ (Connor et al. 2004).

Habitat 5

Polyplumaria flabellata and *Diphasia alata* hydroid community

Characterised by the presence of the hydroids *Polyplumaria flabellata*, *Diphasia alata* and *Aglaophenia tubulifera*, with *Diphasia fallax* often present growing on other hydroids. These species may vary in proportions but usually all common or frequent. The hydroid *Lytocarpium myriophyllum* may be present, often only patchily. The soft coral *Alcyonium digitatum* and the cup coral *Caryophyllia smithii* are often common. In shallower areas red algae such as *Delesseria sanguinea* may be frequent. The hydroids *Nemertesia antennina* and *N. ramosa* are often frequent. A Crisiid turf may be present together with other bryozoans such as *Cellaria* sp.



Figure 13 - Habitat 5 - *Polyplumaria flabellata* and *Diphasia alata* hydroid community. 080815/03, East of the Maidens.

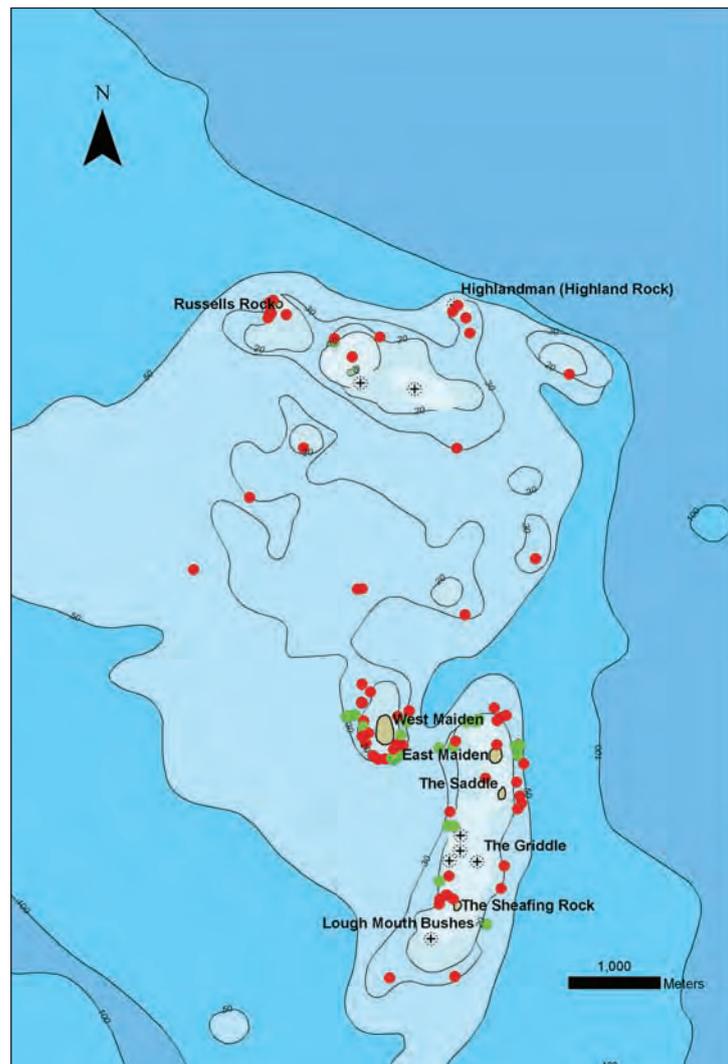


Figure 14 - Habitat 5 ●, Other sampling sites ●

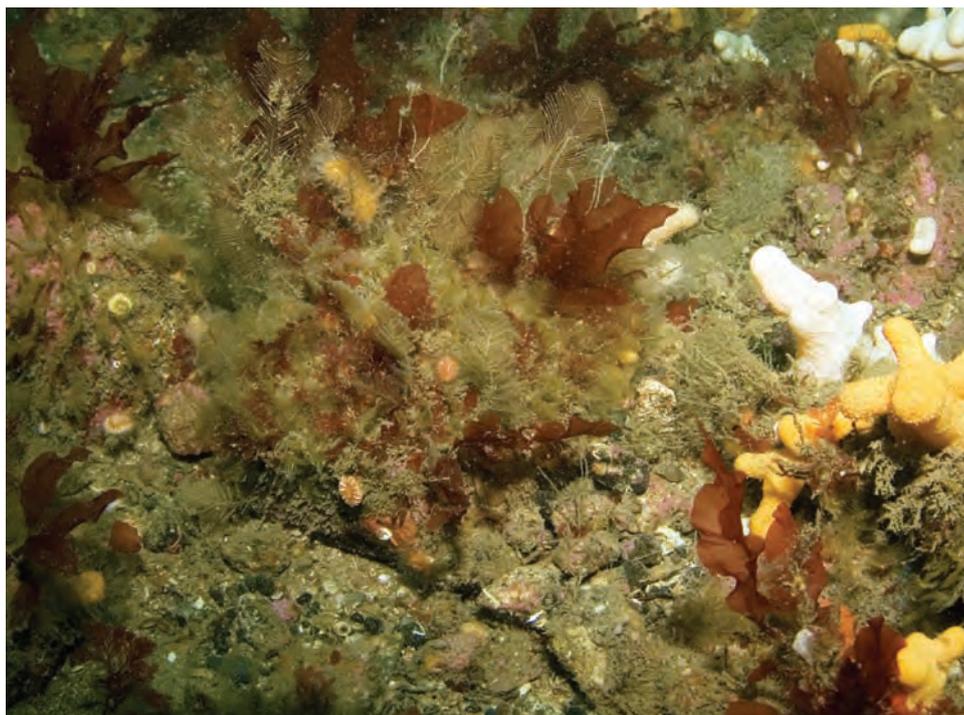


Figure 15 - Habitat 5 - *Polyplumaria flabellata* and *Diphasia alata* hydroid community. 080620/01, East of the Saddle.

Closest biotope – ‘**Bryozoan turf and erect sponges on tide-swept circalittoral rock. CR.HCR.XFa. ByErSp**’

This biotope is typically found on wave-exposed circalittoral bedrock or boulders subject to tidal streams ranging from moderately strong to strong. It often has a thin layer of silt covering the seabed, and is characterised by a bryozoan/hydroid turf with erect sponges. Typical bryozoans to be found include crisiids, *Alcyonidium diaphanum*, *Flustra foliacea*, *Pentapora foliacea*, *Bugula plumosa* and *B. flabellata*, while typical hydroids include *Nemertesia antennina*, *N. ramosa* and *Halecium halecinum*. The soft coral *Alcyonium digitatum* is frequently recorded on the tops of boulders and rocky outcrops. Characteristic erect sponges include *Raspailia ramosa*, *Stelligera stuposa* and *S. rigida*; other sponges present include *Cliona celata*, *Dysidea fragilis*, *Pachymatisma johnstonia*, *Polymastia boletiformis*, *Hemimycale columella*, *Esperiopsis fucorum*, *P. mamillaris* and *Tethya aurantium*. Other species present include *Caryophyllia smithii*, *Actinothoe sphyrodeta*, *Corynactis viridis*, *Urticina felina*, *Balanus crenatus*, *Asterias rubens*, *Marthasterias glacialis*, *Henricia oculata*, *Echinus esculentus*, *Clavelina lepadiformis*, *Calliostoma zephyrinum* and *Necora puber*. Three variants of this biotope have been described, but all are characterised by a bryozoan turf with erect sponges. ByErSp. Eun is found primarily on circalittoral bedrock and is dominated by the seafan *Eunicella verrucosa*. ByErSp. DysAct is found under slightly stronger tide-swept conditions, and is characterised particularly by the sponge *D. fragilis* and the anemone *A. sphyrodeta*. Finally ByErSp.Sag is characterised by the anemone *Sagartia elegans*.’ (Connor et al. 2004).

None of the sub-biotopes fit this habitat. These hydroid communities are extremely rare and unlikely to have

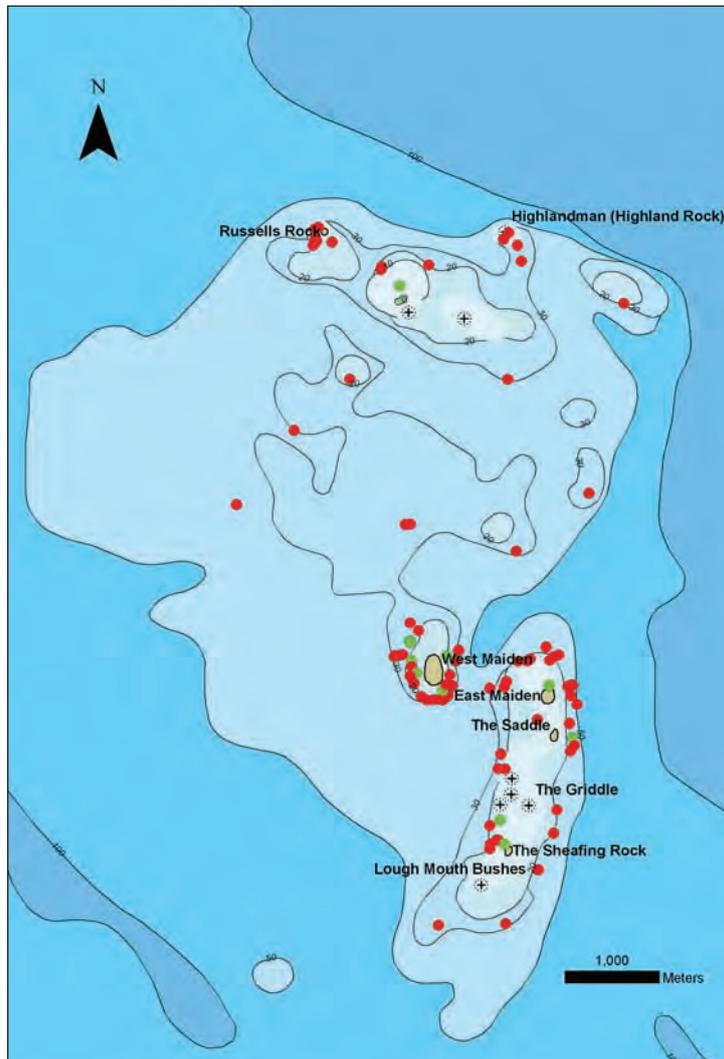


Figure 16 - Habitat 6 (green circle), Other sampling sites (red circle)

been encountered in other areas of the UK. A new biotope is required.

Habitat 6 – *Laminaria hyperborea* kelp forest with an understory of red algae.

Kelp park/forest on medium and large boulders with foliose red algae. Dominant algae include *Bonnemaisonia asparagoides*, *Delesseria sanguinea* and *Audouinella floridula*. Crustose corallines may also be present. Fauna present includes *Actinothoe sphyrodeta*, *Alcyonium digitatum* and *Nemertesia* spp.

Two JNCC sub-biotopes have been combined for this category – IR. HIR.KFaR.LhypR.Pk and IR. HIR.KFaR.LhypR.Ft. More survey work in this depth range would be needed to map these sub-biotopes.

‘*Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock, IR.HIR.KFaR.LhypR’

Very exposed to exposed infralittoral bedrock or large boulders characterised by the kelp *Laminaria hyperborea*, beneath which is a dense turf of foliose red seaweeds. Three variations of this biotope are described: the upper infralittoral kelp forest (LhypR.Ft), the kelp park below (LhypR.Pk) and a third type of kelp forest, confined to southern England, that is characterised by a mixture of *L. hyperborea* and *Laminaria ochroleuca* (LhypR.LoCh). The fauna of these biotopes is markedly less abundant than kelp forests in areas of greater wave surge (LhypFa); sponges, anthozoans and polyclinid ascidians may be present, though never at high abundance. Beneath the under-storey of red seaweeds, the rock surface is generally covered with encrusting coralline algae.’ (Connor et

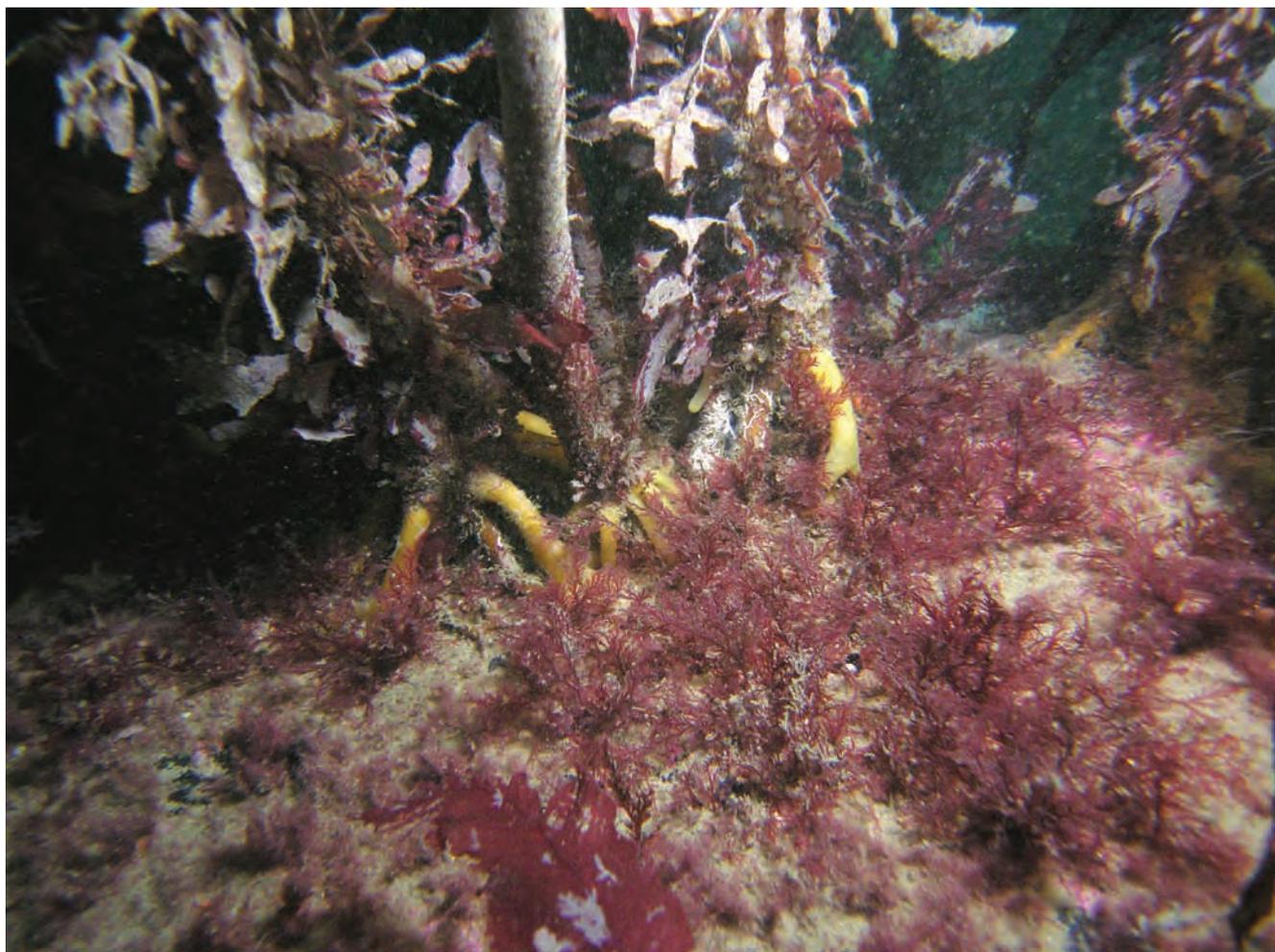


Figure 17 - Habitat 6, Kelp forest with understory of foliose red algae. 080821/01, SE of West Maiden. Image Francis Bunker.

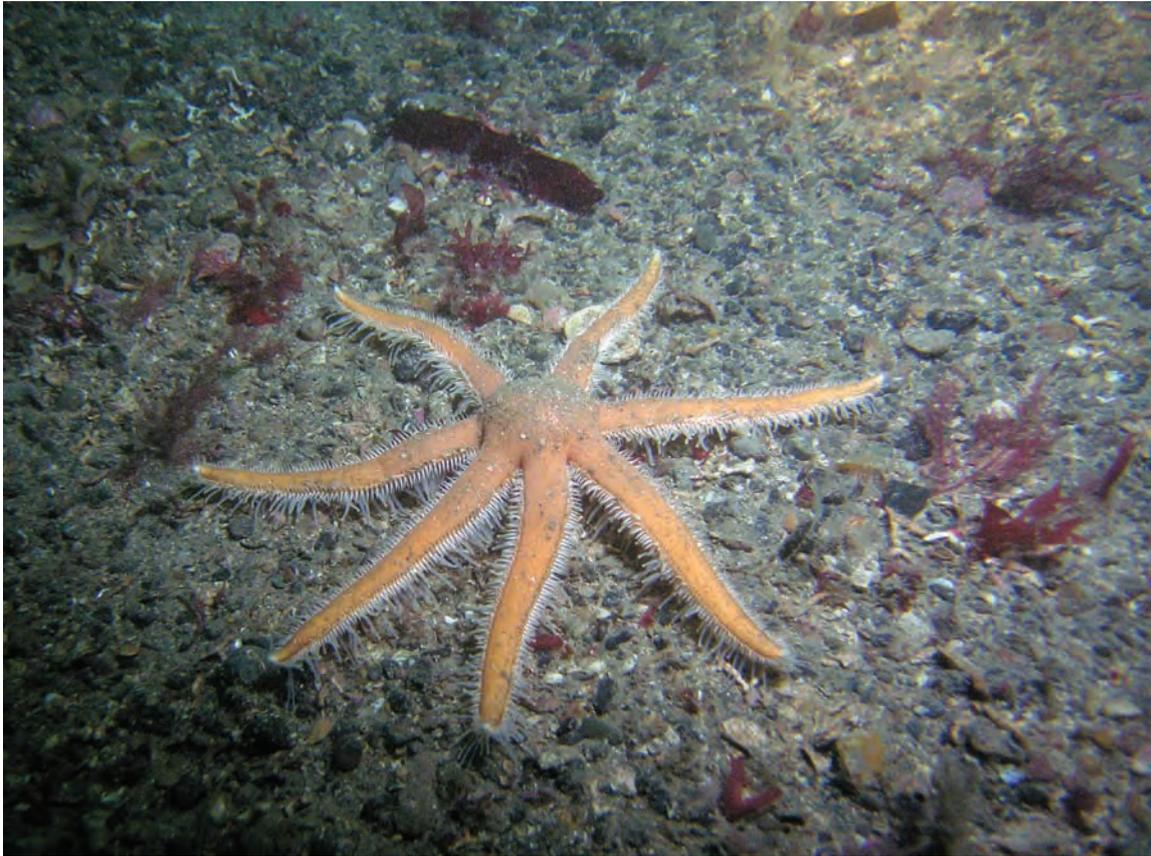


Figure 18 - Habitat 7 - Mixed sediment with kelp park, foliose algae and maerl. 18a Above: 080819/03. West of the Sheafing Rock. 18b Below: 060807/01 NE of the Sheafing Rock



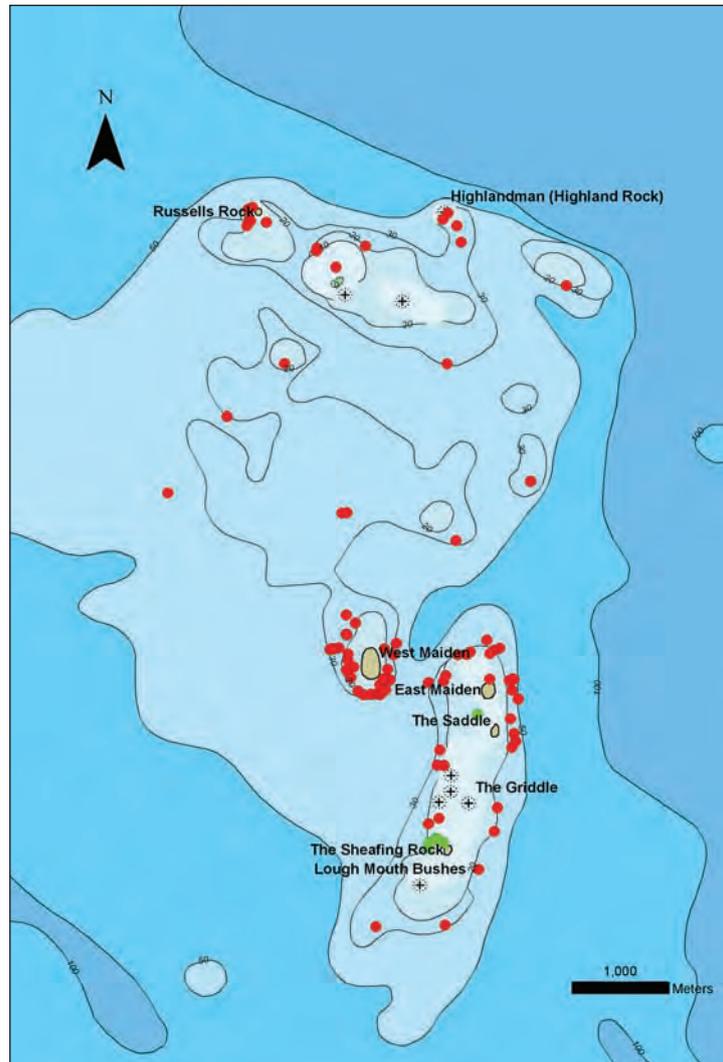


Figure 19 - Habitat 7 ●, Other sampling sites ●

al. 2004).

Habitat 7

Mixed sediment seabed with kelp park, red foliose algae and sparse maerl

Seabed composed of pebbles, shell gravel, sand and sparse maerl. *Laminaria saccharina* kelp park and sparse foliose red seaweeds. Fauna includes *Alcyonium digitatum*, *Alcyonidium diaphinum* and encrusting bryozoans. The seaweed *Desmarestia dresnayi* was present. It is not clear which JNCC biotope this habitat should equate to. It is likely to be an amalgamation of several and further survey work is needed to determine the boundaries of these. This habitat occurs to the west of the rocks on the east side of the group (including the Saddle and the Sheafing rock). It is extremely tide-swept and slack water has proved very difficult to predict, resulting in a relatively low number of survey dives in this area. It would merit further survey work. Some areas of this habitat could be described as a maerl bed, with up to 30% live maerl present. The NICP algae *Desmarestia dresnayi* was frequent in the maerl and gravel sediment in this area, previously the only known Northern Ireland population was at Altacarry head on Rathlin Island. *Carpomitra costata*, another priority algae species was recorded from the Maidens, this has previously been recorded from Rathlin Island, the North Antrim coast and one site on the east coast of Northern Ireland (Carnlough) but records are very scarce. A rare red alga, *Schmitzia hiscockiana* was also recorded. The North Channel appears to be a stronghold for this species.



Figure 20 - Habitat 8 - Tide-swept, poorly sorted mixed cobbles, pebbles and gravel. 080617/03 North of West Maiden

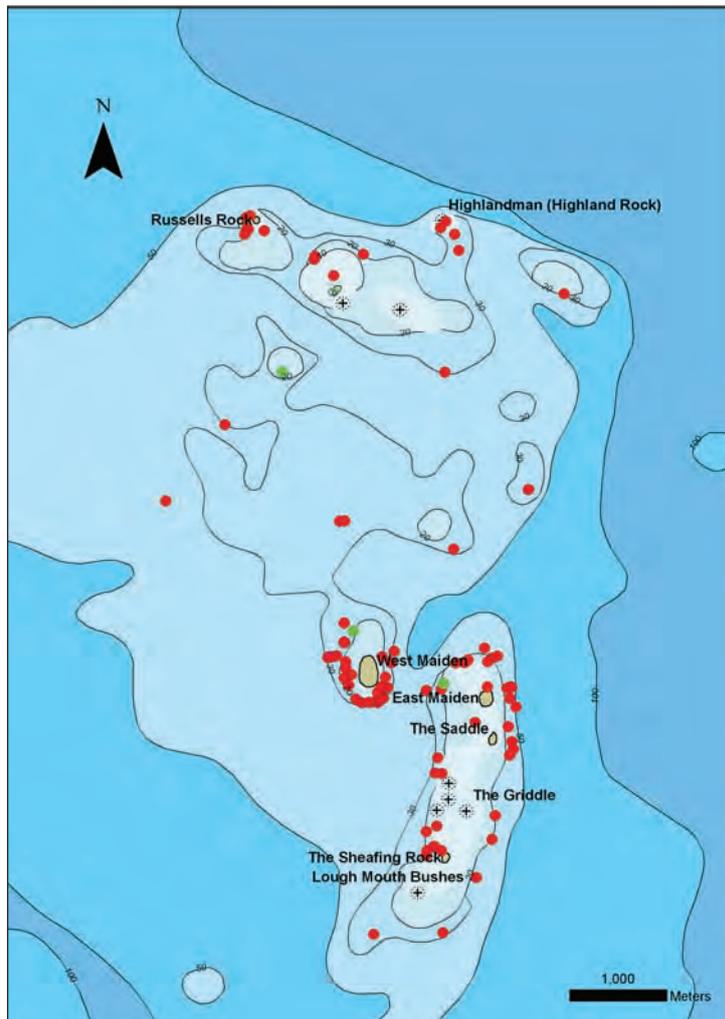


Figure 21- Habitat 8 ●, Other sampling sites ●

Habitat 8 – Tide-swept poorly sorted mixed cobbles, pebbles and gravel

Stable, tide swept level areas of cobbles, pebbles, gravel and sand. Habitat is stable with a dense turf of hydroids and bryozoans on the larger cobbles. Species present include *Nemertesia antennina*, *Flustra foliacea* and occasional *Alcyonium digitatum*. This habitat is present around much of the Maidens but was not extensively surveyed. Scallops (*Pecten maximus*) are present and the community is very vulnerable to disturbance by scallop dredging.

JNCC Biotope - ‘Sparse sponges, *Nemertesia* spp. and *Alcyonidium diaphanum* on circalittoral mixed substrata CR.HCR.XFa.SpNemAdia’

This biotope is found on moderately wave-exposed sand-scoured, circalittoral boulders, cobbles and pebbles that are subject to moderately strong tidal streams (referred to as lag-cobbles locally). It is characterised by sparse sponges and a diverse bryozoan and hydroid turf. The sparse sponge community is primarily composed of *Dysidea fragilis* and *Scypha ciliata*. The mixed faunal turf is composed of *Nemertesia antennina*, *Nemertesia ramosa*, *Halecium halecinum*, *Sertularia argentea*, *Alcyonium digitatum*, *Bugula flabellata*, *Bugula turbinata*, *Bugula plumosa*, *Flustra foliacea*, *Cellepora pumicosa*, *Alcyonidium diaphanum*, *Cellaria fistulosa* and crisiid bryozoans. The anemones *Epizoanthus couchii*, *Sagartia elegans* and *Cerianthus lloydii* may also be recorded. Echinoderms such as the starfish *Asterias rubens*, *Crossaster papposus*, *Henricia oculata* and the crinoid *Antedon bifida*. Other species present include the colonial ascidian *Clavelina lepadiformis*, the barnacle *Balanus crenatus*, the top shell *Gibbula cineraria*, the polychaete *Pomatoceros triqueter*, the ascidian *Morchellium argus*, *Prosthecareus vittatus* and the crab *Cancer pagurus*. It is distributed off Pen Llyn and over considerable areas of the Irish Sea.’ (Connor et al. 2004)

Habitat 9 – Well sorted sandy gravel

Well sorted sandy gravel. Little macrofauna apparent but the cucumber *Neopentadactyla mixta*, slender seapen *Virgularia mirabilis* and the policeman anemone *Mesacmea mitchelli* were recorded. This habitat is patchy,



Figure 22 - Habitat 9 - Well sorted gravel with *Neopentadactyla mixta*. 080617/03 North of West Maiden

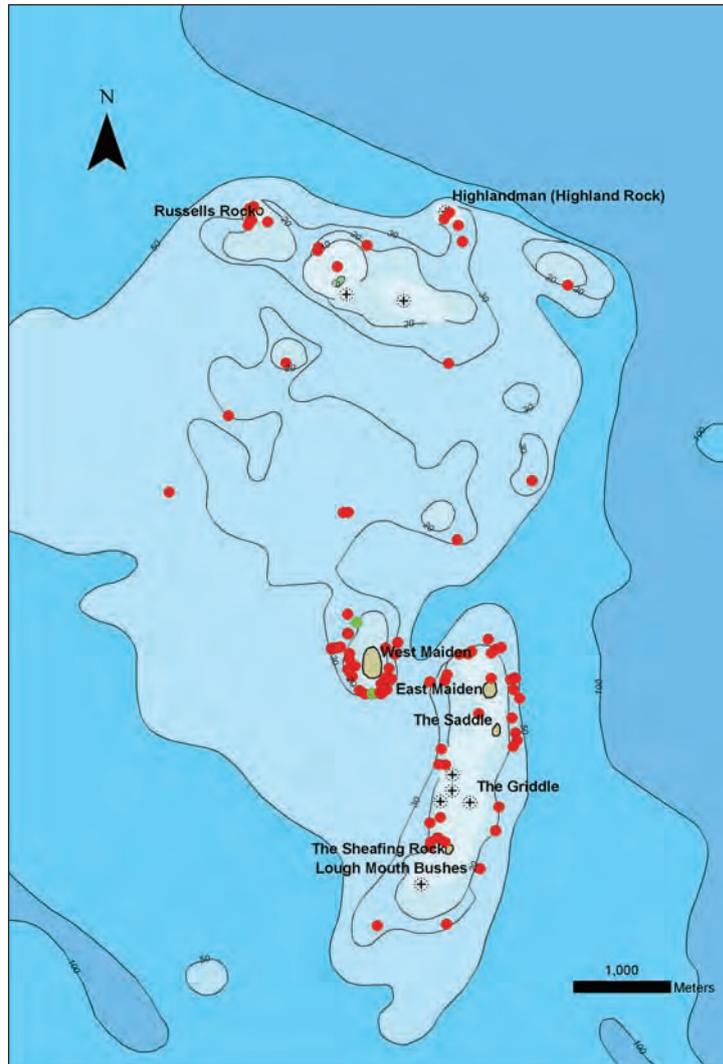


Figure 23 - Habitat 9 ●, Other sampling sites ●

mostly being located in small areas behind boulders.

JNCC biotope ‘*Neopentadactyla mixta* in circalittoral shell gravel or coarse sand SS.SCS.CCS.Nmix’

Sublittoral plains of clean, shell, maerl and / or stone gravels or sometimes coarse sands, with frequent *Neopentadactyla mixta*. *Pecten maximus* may occur occasionally along with *Lanice conchilega*. Other epifaunal species may include *Ophiura albida*, *Pagurus* spp. and *Callionymus* spp. These sediments may be thrown into dunes by wave action or tidal streams. Widespread species such as *Cerianthus lloydii* and *Chaetopterus variopedatus* are present in many examples of this biotope. Scarcely recorded species such as *Molgula oculata*, *Ophiopsila annulosa* and *Amphiura securigera* may also be found. *O. annulosa* only occurs in records from the south-west of the British Isles. It should be noted that *Neopentadactyla* may exhibit periodicity in its projection out of, and retraction into, the sediment (Picton 1993). This biotope may be an epibiotic overlay of the biotope MedLumVen.’ (Connor et al. 2004).

Description of sites

Site 1 – North of Russell's Rock, 54° 57.291'N, 005° 45.008'W

070824/01

North face of Russell Rock. Vertical bedrock with some ledges. *Tubularia indivisa* abundant. Many sponge crusts and erect sponges. Some large patches of *Corynactis viridis* (these were mainly shallower than 28m). Depth surveyed 24-28m.

Site 2 – North of Russell's Rock, 54° 57.298'N, 005° 44.986'W

070824/02

Vertical bedrock to 30m with a cover of *Alcyonium digitatum*, *Caryophyllia smithii* and *Parazoanthus anguicomis*. The cliff leads onto a boulder slope dominated by sponge crusts, *Alcyonium digitatum* and bryozoans, mainly *Cellaria fistulosa* with some *Caberea ellisi*.

Site 3 – South of Russell's Rock, 54° 57.257'N, 005° 45.004'W

060817/01 and 060817/03

Rugged bedrock 26-30m. Dominant species *Caryophyllia smithii*, *Alcyonium digitatum*, *Crisia eburnea*, *Tubularia indivisa*, sponge crusts, *Securiflustra securifrons*, *Cellaria fistulosa* and *Cellaria sinuosa* (all common). Some patches of *Corynactis viridis* and *Actinothoe sphyrodeta* and occasional patches of *Parazoanthus anguicomus*.

Site 4 – South of Russell's Rock, 54° 57.237'N, 005° 45.016'W

060817/02

Vertical bedrock cliff with outcrops forming small shelves, some small boulders at base of cliff. Depth 20-25m. Dominant species *Tubularia indivisa* and *Caryophyllia smithii* (both abundant), *Alcyonium digitatum*, *Actinothoe sphyrodeta*, *Sagartia elegans*, Encrusting sponges, *Cellaria* spp. (all common), and *Crisia eburnia* and *Corynactis viridis* (Frequent).

Site 5 – South-East Russell's Rock, 54° 57.248'N, 005° 44.908'W

060816/03

Vertical smooth bedrock with some ledges. 28m. Dominant species *Alcyonium digitatum*, *Tubularia indivisa* and *Caryophyllia smithii*. Scattered patches of red algae.

Site 6 – NW Allen's Rock, 54° 57.156'N, 005° 44.628'W

060818/01

Bedrock (50%) boulders (35%), cobbles, pebbles and gravel. 26-30m. Characterised by *Caryophyllia smithii*, *Nemertesia antennina* and *Alcyonium digitatum* (common). Occasional *Polyplumaria flabellata* and *Diphasia alata*.

Site 7 – NW Allen's Rock, 54° 57.166'N, 005° 44.624'W

060818/02

Small bedrock outcrops surrounded by boulders, lying on cobbles and pebbles. Depth 26-29m. *Caryophyllia smithii* (abundant) and *Tubularia indivisa* (common) dominant on boulder surfaces. *Parazoanthus anguicomus* frequent underneath boulders.

Site 8 – N of Allen Rock, 54° 57.103'N, 005° 44.518'W

080813/03

19-22m

Kelp park on medium and large boulders with foliose algae and *Actinothoe sphyrodeta*. Scattered *Alcyonium*

digitatum and crustose corallines. Clumps of *Tubularia indivisa* on kelp stipes. Dominant algae included *Bonnemaisonia asparagoides* and *Audouinella floridula*. Small patches of encrusting sponges were present throughout the site.

Site 9. SE of Allen's Rock 54° 56.790'N, 005° 43.898'W

060815/03

Bedrock (84%) with 10% boulders, rest cobble and shell gravel. *Corynactis viridis* (abundant), *Alcyonium digitatum* (abundant) and *Tubularia indivisa* (common).

Site 10 – Mound NE of Allen Rock, 54° 57.172'N, 005° 44.353'W

080617/02

Bedrock mound sloping from ~15m to 28m; 26.5-28m surveyed. At 28m rock adjoined the shelly gravel seabed surrounding it. This seabed was very level. Rock covered with *Alcyonium digitatum* and hydroids such as *Tubularia indivisa*, *Nemertesia antennina*, and *Abietina abietina*. Sponges, particularly *Myxilla fimbriata* common.

Site 11 - East of the Highlandman, 54° 57.237'N, 005° 43.843'W

060815/01 and 060818/03,

Bedrock pinnacle mainly very steep faces but with 10% steeper vertical faces. 26-31m surveyed. Covered in faunal turf; Dominated by *Alcyonium digitatum*, *Sagartia elegans* and *Iophon hyndmani* (common), *Caberia ellesi* (frequent) and *Tubularia indivisa* (occasional).

Site 12 - North of the Highlandman, 54° 57.279'N, 005° 43.892'W

080814/04

Vertical bedrock face from 4-35m+; only 28-33m surveyed. Dense cover of *Tubularia indivisa*, *Corynactis viridis*, *Alcyonium digitatum*, *Nemertesia antennina*, *Cellaria fistulosa* and various sponges. *Crisia* sp. abundant on *Tubularia indivisa* stalks.

Site 13 – Pinnacle SE of Highlandman, 54° 57.044'N, 005° 43.232'W

070824/04 and 060815/02

Plateau at 21m (not surveyed in detail) with abundant mixed red seaweeds and bryozoan turf. From the plateau a steep slope of near vertical bedrock descends to 32m, the bedrock had some horizontal ledges and small boulder area. Bedrock dominated by *Corynactis viridis* and *Alcyonium digitatum*, the more gently sloping areas with abundant *Crisia* sp. Large specimens of *Myxilla incrustans* and *Haliclona viscosa* sponges present, *Iophon nigricans* and *I. nigricans* also frequent.

Site 14 – Pinnacle SW of Maidens Rock, 54° 56.791'N, 005° 44.806'W

080617/01

Level seabed at 30m of pebbles with clean stone gravel inbetween them. Dominated by *Nemertesia* spp. and other hydroids. Erect sponges frequent (*Stelligera stuposa*, *Axinella infudibuliformis*, *Myxilla fimbriata*) and some crusts. Bedrock reef sloping up from seabed dominated (visually) by *Alcyonium digitatum* and *Caryophyllia smithii*.

Site 15 – North West of West Maiden, 54° 56.620'N, 005° 45.126'W

080813/01

Bedrock mound from 31-31.5m. A few (~3% boulders) and a small amount of shell gravel (7%) were present. Dominant species *Cellaria fistulosa*, *Alcyonium digitatum*, *Nemertesia antennina*, and *Parasmittina trispinosa*.

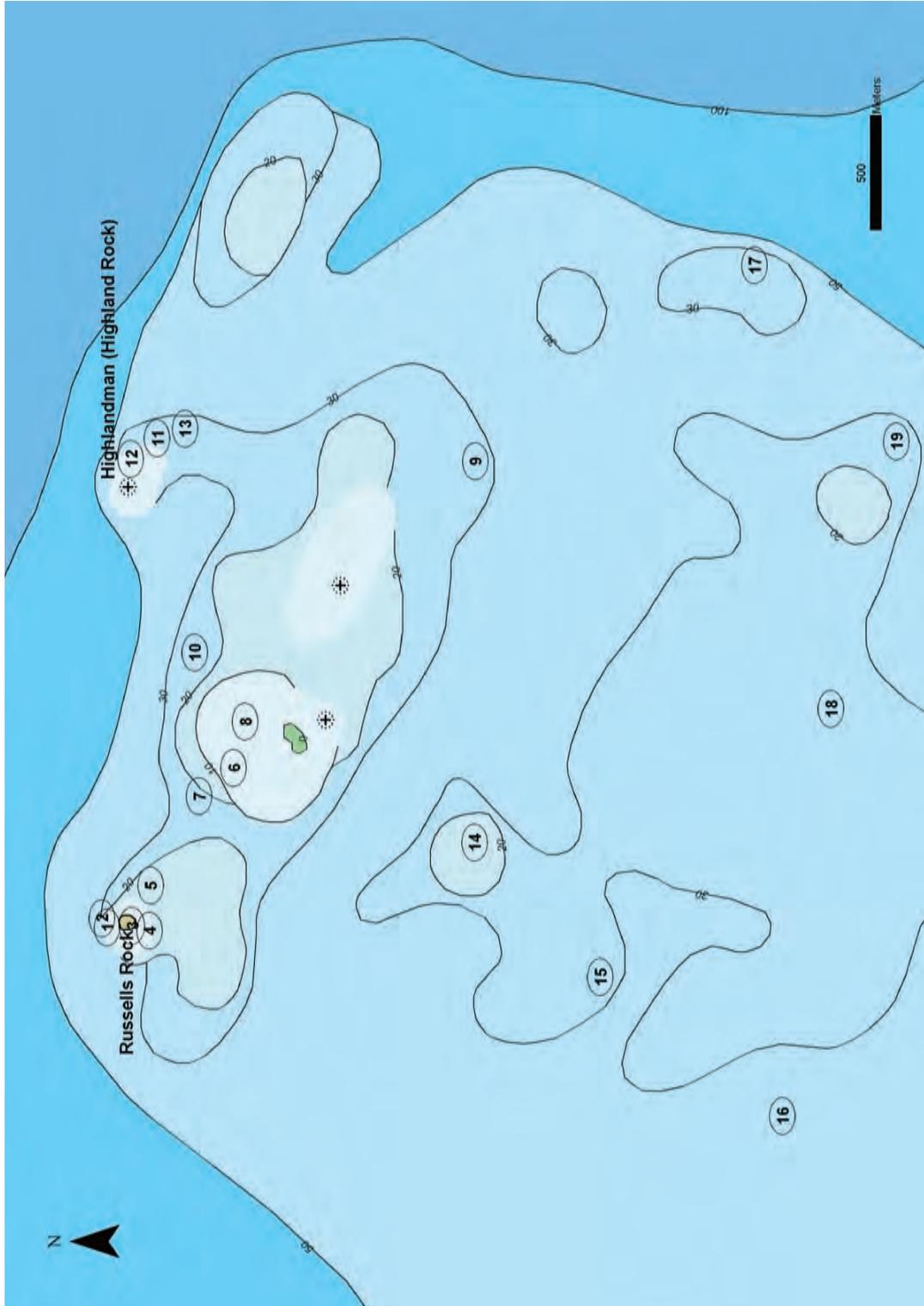


Figure 24 - Sites 1-18, The Highlandman, Allen's Rock, Russell's Rock

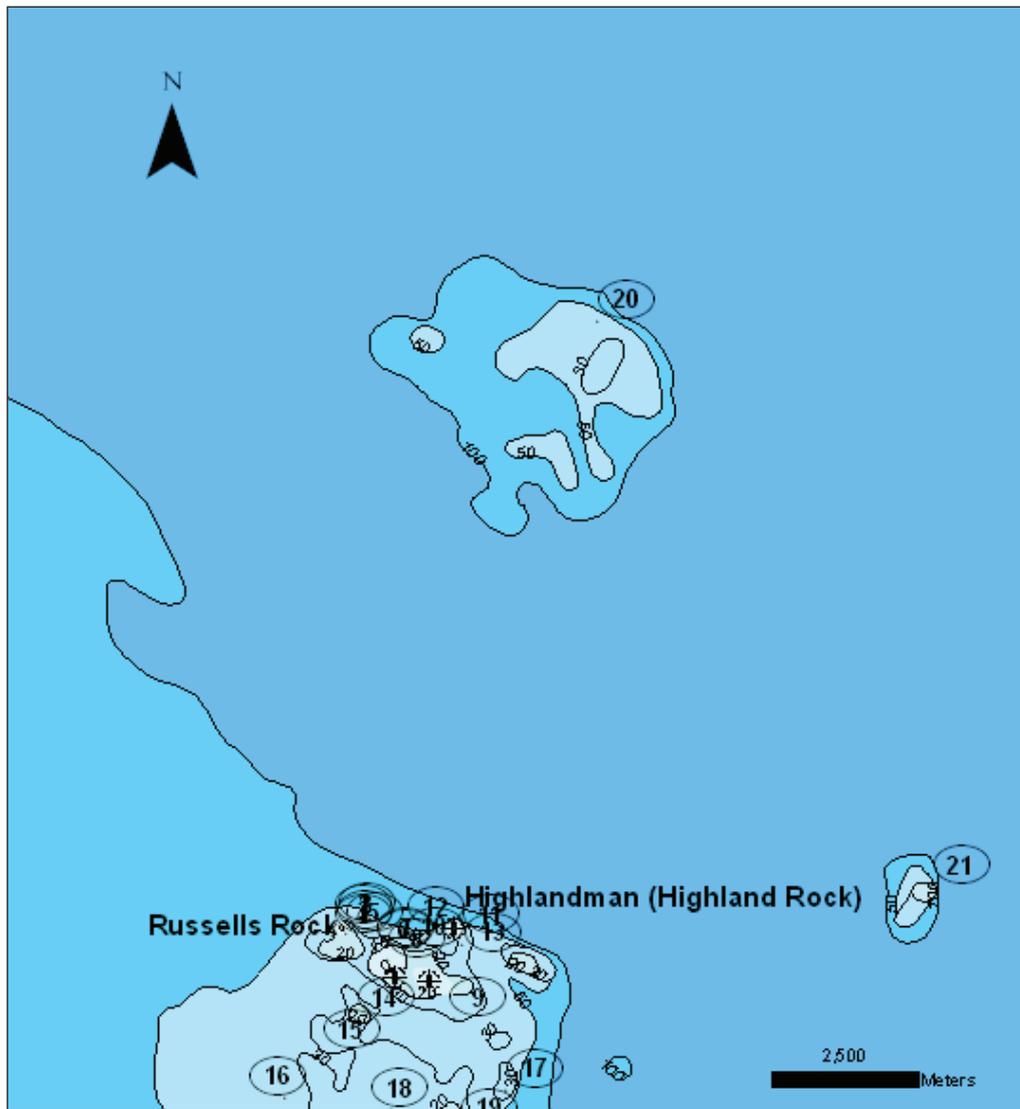


Figure 25 - Sites 20 and 21 - Annika's Pinnacle and Pinnacle East of the Maidens

Site 16 – Pin Head Pinnacle, 54° 56.372'N, 005° 45.457'W

070824/03

Gently sloping bedrock mound - top at 27m. Sloped down to seabed at 35.5m. Some small vertical faces. A few boulders were sitting on the base of the bedrock slope, the surrounding seabed appeared to also be composed of boulders (not surveyed). Cover mainly hydroids and bryozoans (dominant species *Aglaophenia tubulifera*, *Nemertesia antennina*, *Alcyonium digitatum*, *Abietinaria abietina*, *Securiflustra securifrons* all frequent), and erect sponges. Pin head squirts (*Pycnoclavella* sp. – unidentified species) were present over much of the bedrock surface. The hydroids *Polyplumaria flabellata*, and *Diphasia alata* were also present in small numbers on the deeper parts of the slope (>30m).

Site 17 – NNE East Maiden, 54° 56.410'N, 005° 43.431'W

060808/01 and 060808/02

Vertical 2m high cliff leading onto mixed sediment (25% pebbles, 15% gravel, 10% sand). 26-36m surveyed. Cliff covered in *Corynactis viridis*, *Tubularia indivisa*, and encrusting sponges. *Alcyonium digitatum* occasional and *Parazoanthus anguicomus* rare.

Site 18 – Reef North of West Maiden, 54° 56.306'N, 005° 44.487'W

080722/04, 080722/03

Bedrock cliff from 25-30m, mainly very steep faces. Dominated by *Tubularia indivisa*, *T. larynx*, *Alcyonium*

digitatum, *Actinothoe sphyrodeta*, *Caryophyllia smithii*, and *Parazoanthus anguicomus*. At the base of the reef is a fairly level seabed (31-33m BCD), gravel with pebbles, cobbles, one small bedrock outcrop. Not very species rich, obviously tide-swept. Main cover *Tubularia indivisa* and *Alcyonium digitatum*.

Site 19 – Pinnacle between Maidens and Allen’s Rock, 54° 56.217’N, 005° 43.850’W

080620/03

Gentle slope of rounded bedrock terraces and some large boulders at 20-25m. Densely covered with *Tubularia indivisa*, *Alcyonium digitatum*, *Caryophyllia smithii* and a moderately large variety of other species of hydroids, sponges and anemones. Some foliose red algae, mostly small and difficult to identify, became more dominant at 20m, notably *Delessaria sanguinea*. Notable species included very large barnacles (*Balanus balanus*). The nudibranch *Dendronotus frondosus* was frequent on the *Tubularia indivisa*. One patch of *Parazoanthus anguicomus* was present.

Site 20 Annika’s Pinnacle, 55° 00.532’N, 005° 42.585’W

060816/01 and 060816/02

Pinnacle, with a large gently sloping, top. Situated to the North of the Maidens. Only the shallowest parts of the pinnacle top (the North West corner) were surveyed – depth 32-36m.

Substrate Mainly boulders (~80%) with the remained composed of small boulders, cobbles and pebbles. Fauna dominated by *Corynactis viridis* (mainly on vertical faces), *Axinella infundibuliformis*, *Tubularia indivisa*, *Caryophyllia smithii*, *Sertularia argentea* and *Alcyonium digitatum*.

Site 21, Pinnacle East of the Maidens, 54° 57.50’N, 005° 39.50’W (NISS data only)

850801/01 and 850801/02

Uneven rugged bedrock dropping slowly with small gullies and pockets containing boulder, cobble or gravel. Dominated by *Tubularia indivisa* with *Corynactis viridis* and *Alcyonium digitatum* common.

Site 22 North of West Maiden 54° 55.978’N, 005° 44.460’W

070813/01

Gently stepped bedrock reef with some vertical walls. Small pockets of sand on some ledges. Bryozoans dominant (*Cellaria* sp, *Crisiidae* and encrusting species) together with *Alcyonium digitatum*.

Site 23, North of West Maiden 54° 55.952’N, 005° 44.410’W

Dives 080617/03 and 080617/04

Upper circalittoral moderate slope of low lying bedrock mounds surrounded by shell gravel and coarse sand. Bedrock influenced by scour and fairly strong tidal currents. Bedrock surfaces dominated by bryozoan and hydroid turf, species include *Securiflustra securifrons*, *Cellaria*, *Halecium halecinum*, *Diphasia pinnaster* and *Sertularia argentea*. Numerous sponges, particularly *Polymastia boletiformis*, *Dysidea fragilis* and *Axinella infundibuliformis*. *Caryophyllia smithii* also common. Some sparse foliose red algae, notably *Delessaria sanguinea*. Encrusting coralline algae abundant.

Site 24 – NW of West Maiden 54° 55.917N, 005° 44.461W

080811/01 and 080811/02

Bedrock ridges, shallowest point around 15m lying on mixed shell gravel and sand seabed at 26m. In the infralittoral (15-17m) the silty bedrock was covered in kelp park and algae. Dominant species were *Audouinella floridula*, *Delessaria sanguinea*, *Heterosiphonia plumosa*, *Laminaria hyperborea*, *Kallymenia reniformis*. Scattered plants of *Carpomitra costata*. *Tubularia indivisa* on some kelp plants. *Caryophyllia smithii* dominant on rock faces.

In deeper area (17-26m) the cover became more animal dominated; *Caryophyllia smithii* was still abundant but hydroids such as *Polyplumaria flabellata* (Frequent) and *Diphasia alata* (Occasional) were also present.

Sponges such as *Stelligera stuposa*, *Raspailia hispida*, *Axinella infundibuliformis* and encrusting sponges were common. In the gullies between ridges rock surfaces were dominated by *Nemertesia antennina*.

The sandy gravel surrounding the ridges was dominated by *Alcyonidium diaphinum*, *Securiflustra securifrons*, and *Lanice conchilega*. Free living *Caryophyllia smithii* were also present.

Site 25 – Hydroid Garden, NW of West Maiden 54° 55.866'N, 005° 44.551'W

060818/04, 070813/02, 080618/03, 080815/03

Hydroid dominated rounded hillocks of bedrock, gently sloping to seabed of gravel with occasional boulders, from 26-32m surveyed. Characterising species were *Diphasia fallax*, *D. nigra*, *D. alata* and *Polyplumaria flabellata*. Bryozoan species mainly *Cellaria fistulosa* and *Securiflustra securifrons*. *Goniodoris nodosa* was abundant, feeding on *Alcyonidium diaphinum*. *Lytocarpia myriophyllum* occasional. Occasional *Diphasia nigra*. Very attractive site.

Site 26 – West of West Maiden 54° 55.852'N, 005° 44.451'W

080815/04

Lower infralittoral boulders (19-21m) on a steep slope with very sparse *Laminaria hyperborea*. Sediment on the boulders and also a fuzz of *Rhodothamniella floridula* together with foliose red algae, *Alcyonium digitatum* and *Nemertesia* spp. Dominant algae included *Delesseria sanguinea*, *Rhodothamniella floridula* and *Bonnemasonia asparagoides*. There were some pockets of sandy shell sediment and gravel between the boulders.

Site 27 – West of West Maiden, 54° 55.832'N, 005° 44.452'W

080618/04

Moderately sloping bedrock (~30 degrees) at 21m with foliose red algae, *Alcyonium digitatum* and *Caryophyllia smithii* visually prominent, together with a wide range of hydroids including *Polyplumaria flabellata* (Common), *Diphasia alata* (Frequent), *Tubularia indivisa* (Frequent) and *Sertularia argentea* (Occasional). Levelled off at ~23m in a boulder field with hydroids dominant. Clean stoney gravel present between boulders.

Site 28 – West of West Maiden, 54° 55.810'N, 005° 44.419'W,

080812/03

Kelp forest on steeply sloping rock overlain by silty sand (6-10m). Dense crustose corallines and patches of dark red algae and *Cutleria multifida* covered the rock under the sand. Cover of *Audouinella floridula* conspicuous and sometimes dense. Dense areas of *Heterosiphonia plumosa* and large clumps of *Delesseria sanguinea* present. Dense foliose epiphytes common on kelp stipes including *Ptilota gunneri*, *Cryptopleura ramosa*, *Phycodrys rubens* and *Polysiphonia stricta*. Animals included big *Caryophyllia smithii*, the anemone *Hormathia coronata*, scattered clumps of *Alcyonium digitatum* and bryozoans including *Electra pilosa* and *Membranipora membranacea*.

Site 29 – West of West Maiden, 54° 55.800'N, 5° 44.460'W

070814/04

Very large angular, almost cuboid, boulders - approx. 3m high in some cases (depths of 28-31m surveyed). Some mixed sand, pebbles and cobbles in between boulders. Many sponge crusts and much *Tubularia indivisa* on boulder faces, *Caryophyllia smithii* abundant. One small boulder with *Polyplumaria flabellata*, *Diphasia alata* and *Diphasia fallax* present but these species were not seen elsewhere in the site. *Labrus mixtus* very common, one male seen but 30-50 females.

Site 30 – South West of West Maiden, 54° 55.775'N, 005° 44.436'W

060818/05

Steep boulder slope of large and small boulders with some outcrops of bedrock (20%), sand and pebbles in between boulders. 19-27m surveyed. Dominated by *Alcyonium digitatum* (Frequent), *Tubularia indivisa* (Common), *Nemertesia ramosa* (frequent), *Nemertesia antennina* (occasional), *Sertularia argentea* (Frequent) and *Aglaophenia tubulifera* (Common). In the shallow parts of the site some red seaweeds were still in

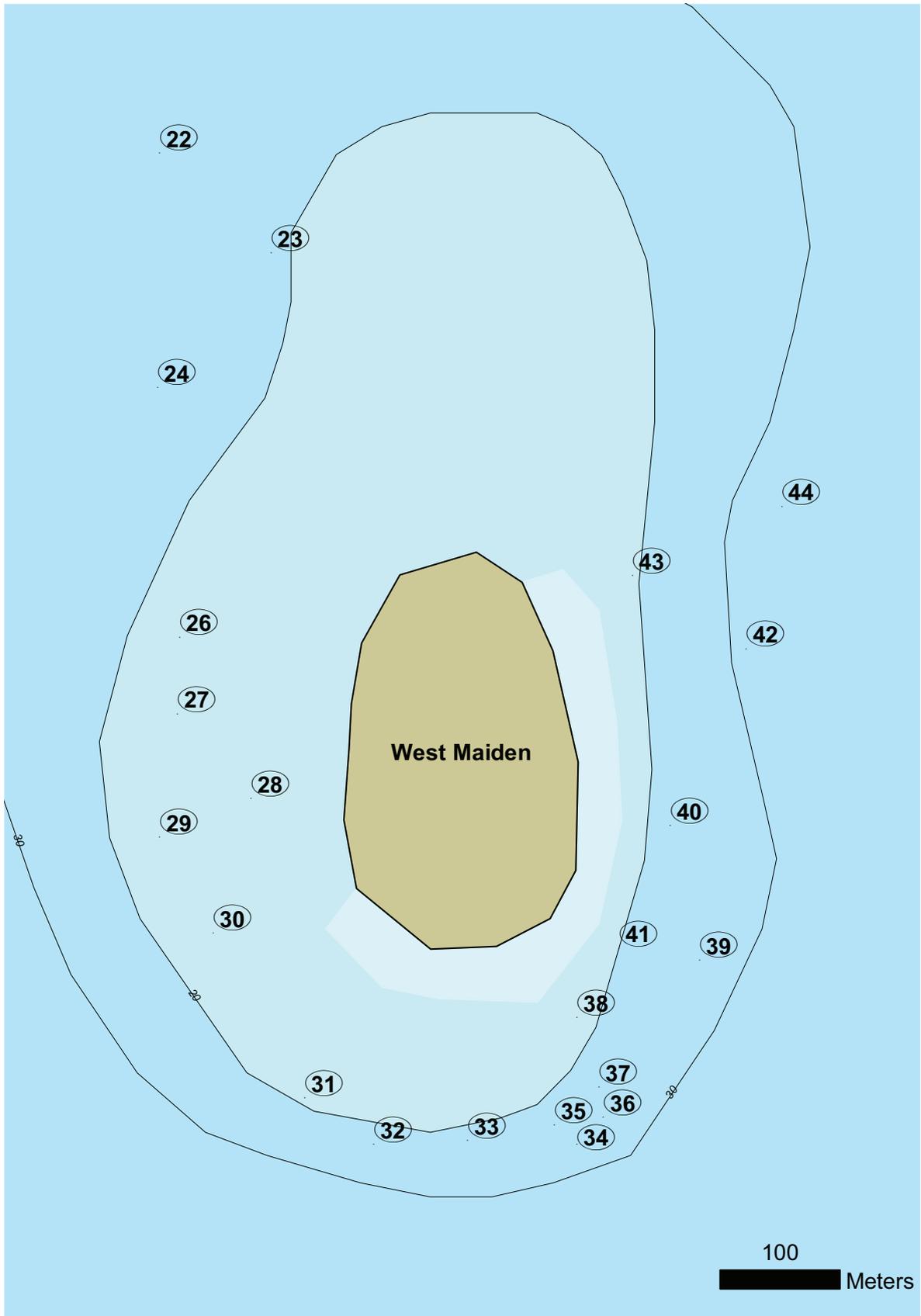


Figure 26 - Sites 22-44, West Maiden

evidence, notably *Delesseria sanguinea* and *Ptilota plumosa*. There were some small patches of *Polyplumaria flabellata*.

Site 31 – South of West Maiden, 54° 55.732'N, 005° 44.395'W

080724/04

Boulder slope of very large (20%), Large (60%) and small (10%) boulders with some sand in between them. Depth surveyed from 25-35m. Slope dominated by *Tubularia indivisa* and *Alcyonium digitatum* (both common). Other hydroids such as *Aglaophenia tubulifera*, *Nemertesia antennina*, *Nemertesia ramosa* (all Frequent) and *Polyplumaria flabellata* (Occasional) also present.

Site 32 South of West Maiden, 54° 55.720'N, 005° 44.364'W

060816/05

Boulder (45%), sand (15%) and cobble (20%) slope with some bedrock outcrops (20%). 25-28m BSL surveyed. Dominant fauna *Caryophyllia smithii* (Abundant), *Alcyonium digitatum* (Frequent), *Sagartia elegans* (Frequent), and *Actinothoe sphyrodeta* (Frequent). Several hydroid species present: *Lytocarpia myriophyllum* (Frequent), *Tubularia indivisa* (Occasional), *Aglaophenia tubulifera* (Common).

Site 33 South of West Maiden 54° 55.721'N, 005° 44.322'W

060816/04

Slope of boulders and coarse sand (30%). 26-34m BSL surveyed. Dominant fauna *Alcyonium digitatum* (Common) and *Caryophyllia smithii* (Abundant). Many hydroid species including *Lytocarpia myriophyllum*, *Aglaophenia tubulifera* (Frequent), *Nemertesia antennina*, *N. ramosa* and *Sertularia argentea*, *Diphasia alata*, and *Diphasia fallax* (Occasional) present. One specimen of the policeman's helmet anemone *Mesacmea mitchelli* was present in a sand patch.

Site 34 – South –East of West Maiden, 54° 55.720'N, 005° 44.273'W

080724/03

Boulder slope - 25-37m surveyed. Mainly small boulders, but some bedrock outcrops and very large boulders. Dominant species *Nemertesia ramosa*, *Axinella infundibuliformis*, *Ascidia mentula* and *Caryophyllia smithii*. Patches of *Diphasia alata*, *D. fallax*, *Lytocarpia myriophyllum*, and *Polyplumaria flabellata*. One boulder covered in pin head squirts (*Pycnoclavella* sp.)

Site 35 – SE of West Maiden, 54° 55.725'N, 005° 44.283'W

070814/01, 070814/02, 070817/01 and 070817/02

Slope of Angular boulders (5% very large, 50% large and 35% small) with some sand present between boulders. Boulder size decreased with depth. *Caryophyllia smithii* and sponge crusts common on vertical faces of boulders. *Alcyonium digitatum*, *Aglaophenia tubulifera*, *Nemertesia* spp. and *Lytocarpia myriophyllum* Frequent. Some clusters of hydroids on individual boulders including patches of *Polyplumaria flabellata* and *Diphasia alata*.

Site 36 – SE of West Maiden, 54° 55.727'N, 005° 44.261'W

060817/04 060817/05

Boulder slope of mixed size boulders (20% very large, 20% large, 25% small) with sand inbetween them (10%), occasional bedrock outcrops also present (26-31m BSL surveyed). Surfaces dominated by *Alcyonium digitatum*, *Caryophyllia smithii* (Abundant) and Hydroids including *Aglaophenia tubulifera*, *Nemertesia* spp, *Diphasia alata*, and *Polyplumaria flabellata* (all frequent). Sponge crusts were common and *Axinella infundibuliformis* frequent.

Site 37 SE of West Maiden, 54° 55.735'N, 005° 44.263'W

080620/02

A 45 degree boulder slope (mainly large boulders) with small patches of clean gravel between them. Lower infralittoral and upper circalittoral (18-26m BCD) surveyed. Variety of hydroids including *Tubularia indivisa*, *Nemertesia antennina* (both common), *Diphasia alata*, *Diphasia attenuata*, *Diphysia pinnaster*, *Polyplumaria flabellata*, and *Aglaophenia tubulifera* (all frequent), *Alcyonium digitatum* (common) and *Caryophyllia smithii* (abundant) visually dominant throughout the site, together with *Delesseria sanguinea* and other foliose red algae in the infralittoral.

Site 38, SE of West Maiden 54° 55.753'N, 5° 44.273'W

080821/01

Laminaria hyperborea kelp forest on bedrock (80%) with some boulders (20%) (6-7.4m BSL surveyed). Silty surfaces of rock covered with *Rhodothamniella floridula* on silty surface together with coralline and dark red crusts, and *Plocamium cartilagineum*. Kelp stipes with dense algal cover but low species diversity. Species present on stipes included *Callophyllis laciniata*, *Phycodrys rubens*, *Cryptopleura ramosa* and lesser amounts of *Membranoptera alata* and *Ptilota plumosa*. Boulders beneath the high bedrock outcrops covered in dark red crusts with sparse algae, including *Brongniatella byssoides*, and occasional *Caryophyllia smithii*.

Site 39, East of West Maiden, 54° 55.768'N, 5° 44.218'W

060814/01, 060814/02

Slope of very large (50%) and large (50%) boulders. 28-32m BSL. Surfaces of boulders dominated by *Tubularia indivisa* and *Caryophyllia smithii* (both abundant), *Alcyonium digitatum* and Porifera crusts also common. Some patches of *Corynactis viridis* and *Parazoanthus anguicomus*. *Diphasia alata*, *Lytocarpia myriophyllum*, Pin Head squirt and the sponge *Clathria barleei* present (rare)

Site 40 East of West Maiden, 54° 55.803'N, 005° 44.231'W

080723/02

Boulder slope 25-27m surveyed, but shallowest point around 15m and slope also progresses down into deeper water. Very large (50%) boulders, some >7m; and large boulders (20%) with pockets of fine silty sand in between them. Main animal cover *Caryophyllia smithii* (abundant), sponge crusts and *Alcyonium digitatum* (both frequent). One patch of *Lytocarpia myriophyllum*, and another of *Diphasia alata* and *Polyplumaria flabellata* present.

Site 41, South-East of West Maiden, 54 55.771, 005 44.254W

080822/02

Boulder slope with very large and large boulders leading to small boulders, cobbles and sediment (not surveyed), depths surveyed 19-26m BCD. Dominant cover of *Caryophyllia smithii*, *Tubularia indivisa*, *Alcyonium digitatum* and bryozoan crusts (all common). Some red seaweeds still in evidence, notably *Delesseria sanguinea* and *Ptilota plumula*. Erect sponges and hydroids present including a small patch of *Polyplumaria flabellata*.

Site 42, East of West Maiden, 54° 55.849'N, 5° 44.197'W

080819/01

Very large (70%) and large (20%) silted boulders on a moderate slope characterised by *Caryophyllia smithii*, sparse algae and hydroids, with diverse sponge crusts on verticals. Hydroids included *Tubularia indivisa*, *Nemertesia antennina*, *N. ramosa* and *Polyplumaria flabellata* (all occasional). Occasional *Alcyonium digitatum* also present. *Cellaria fistulosa* frequent.

Site 43 – North of West Maiden, 54° 55.868'N, 005° 44.248'W

080821/02

Rugged bedrock (80%) and large boulders (20%) covered in dense *Laminaria hyperborea* forest. Depth surveyed 6-11m BSL. Dense epiphytes on kelp stipes, including abundant *Palmaria palmata*. Understory of corraline crusts, vertical faces had a more diverse assemblage of hydroids including *Abietinaria abietina*, and *Tubularia indivisa* (common), *Aglaophenia tubulifera* and *Diphasia fallax* (occasional), *Delesseria sanguinea*, *Alcyonium digitatum* (common), and *Caryophyllia smithii* (frequent). Occasional crevices and ledges present.

Site 44 – NE of West Maiden, 54° 55.886'N, 005° 44.181'W

080814/01, 080815/01, 080818/02

Vertical rock wall 3m high (29-34m BCD), covered with *Caryophyllia smithii*, *Alcyonium digitatum* (both common), and encrusting sponges (abundant). Sloping and upper faces of bedrock dominated by *Nemertesia antennina* and several species of erect and massive sponges, including *Polymastia boletiformis*, *Axinella infundibuliformis*, *Stelligera stuposa* and *Myxilla fimbriata*. Some interesting sponge species present including *Sphaerotylus* sp., *Hymedesmia stellifera* (recently described from Rathlin Island) and a bright yellow *Hymedesmia* believed to be a new species. Some patches of *Lytocarpia myriophyllum* present.

Site 45, Between West and East Maiden, 54° 55.759'N, 005° 44.001'W

070814/03

Rocky ledges with steeply dropping/vertical faces approximately 1m high at a depth of 29m BSL, going gradually down to boulders and occasional sandy/gravel patches at 34m BSL. Horizontal faces dominated by *Securiflustra securifrons*, whilst vertical faces dominated by bryozoan and sponge crusts. Characterising hydroids *Diphasia alata*, *Diphasia fallax* and *Lytocarpia myriophyllum* (occasional); and *Diphasia nigra*, and *Polyplumaria flabellata* (rare). *Alcyonium digitatum* also common.

Site 46, NW of East Maiden, 54° 55.763N, 005° 43.919W

080820/02

Bedrock slope from 25-29m BSL, mainly upper (40%) and very steep (40%) faces. Above 26m the rock was dominated by *Securiflustra securifrons* but in deeper parts it became sponge and hydroid dominated, including frequent *Polyplumaria flabellata* and common *Diphasia alata*. The rock met the surrounding level seabed at 29m, this was shell gravel and cobble with *Alcyonidium diaphinum* (common), *Pecten maximus* (occasional) and *Ascidia virginea* (occasional) present.

Site 47, West of East Maiden, 54° 55.782'N, 005° 43.906'W

080814/03

Pebble and gravel plain (23-23.7m BSL) with pockets of shell gravel sediment. Cover sparse foliose algae and hornwracks. Dominant species were *Acrosorium venulosum*, *Delesseria sanguinea* (both frequent), *Securiflustra securifrons* (common) and *Cellaria fistulosa* (occasional).

Polyplumaria flabellata (occasional) and *Diphasia alata* (rare) were present on bedrock adjacent to the gravel but this was not surveyed in detail.

Site 48 – East Maiden, 54° 55.849'N, 005° 43.839'W

080620/04

A gentle bedrock slope (22.5-32.5m BCD) dominated by hydroids with a turf of *Crisiidae* spp beneath. Hydroids included *Tubularia indivisa*, *Nemertesia antennina* (common), *Aglaophenia tubulifera*, *Nemertesia ramosa*, *Diphasia alata* and *D. pinnaster* (Frequent), *Polyplumaria flabellata*, *Halecium halecinum* and *Halecium plumosum* (occasional). *Crisiidae* spp common and *Securiflustra securifrons* and *Alcyonium digitatum* frequent.

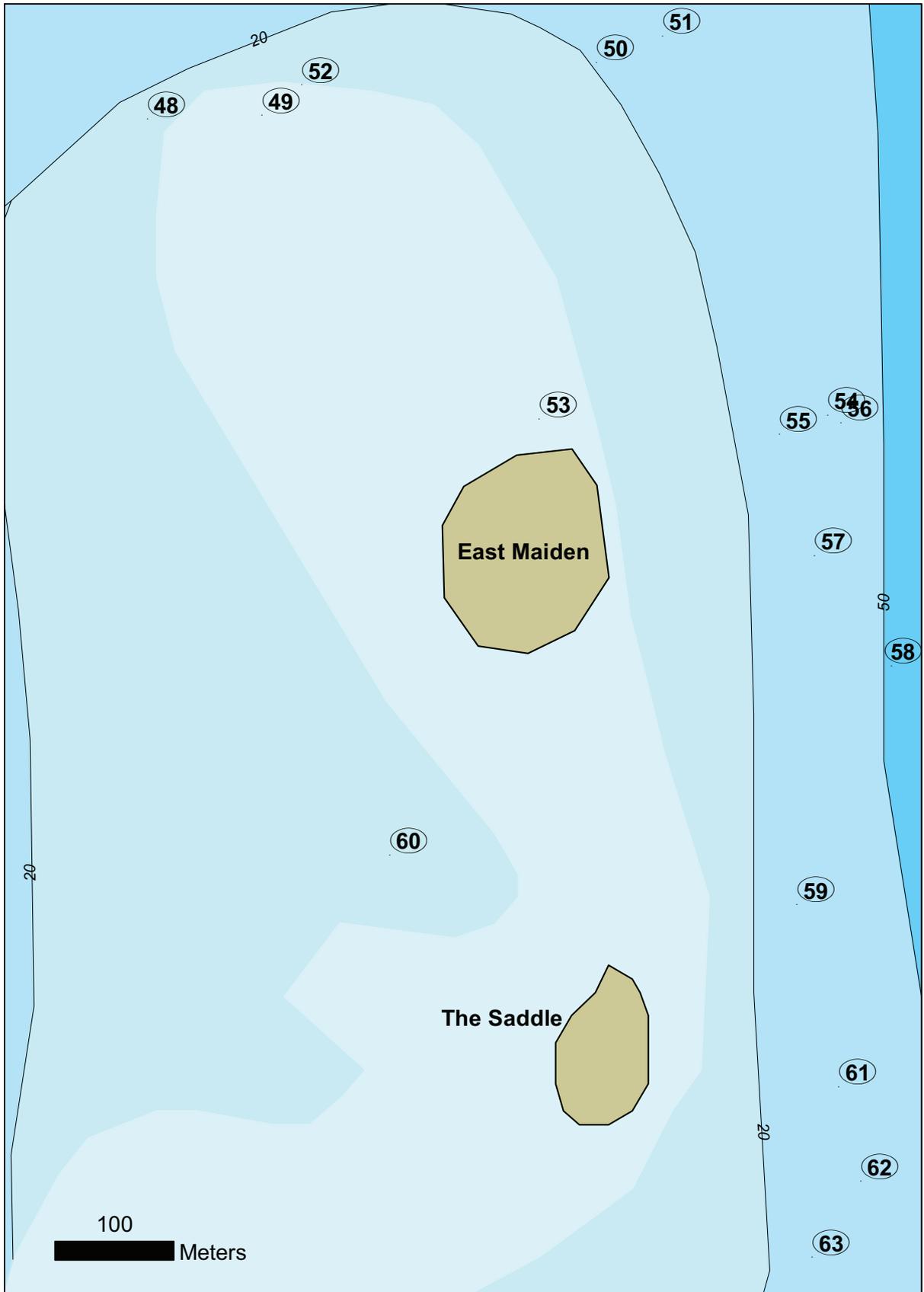


Figure 27 - Sites 45-63, East Maiden and the Saddle

Site 49 – NNW East Maiden, 54° 55.850'N, 005° 43.787'W

060814/05

Slope of large (60%) and very large (30%) boulders with 10% sand. 28-31m BSL. Main cover *Caryophyllia smithii* (abundant), *Alcyonium digitatum*, *Alcyonidium diaphinum* and Porifera crusts (common). Many hydroids present including *Sertularella gayi*, *Diphasia pinnaster*, *D. fallax*, *D. alata*, *Polyplumaria flabellata*, *Aglaophenia tubulifera*, *Nemertesia antennina* and *N. ramosa* (all frequent).

Site 50, North of East Maiden, 54° 55.864N, 5° 43.635W and 54° 55.897N, 005° 43.677'W

060814/02, 060814/03, and 060815/06

Mixed boulders (mainly very large (40%) and large (30%)) with some bedrock outcrops (10%) and coarse sand between boulders. Depth 21-32m BSL. Dominated by *Alcyonium digitatum* (abundant), *Tubularia indivisa* (abundant), *Caryophyllia smithii* (abundant), sponge crusts (common) and *Actinothoe sphyrodeta* (frequent). *Parazoanthus anguicomus* and *Clathria barleei* also present (rare).

Site 51 North of East Maiden, 54° 55.871'N, 005° 43.605'W

060807/03

Mixed large and small boulders at 29.5m BSL. Main cover hydroids including *Tubularia indivisa*, *Nemertesia antennina*, *N. ramosa*, *Aglaophenia tubulifera* (frequent) and massive (including frequent *Polymastia boletiformis* and *Axinella infundibuliformis*) and encrusting sponges. *Actinothoe sphyrodeta* also frequent. *Flustra foliacea* and *Alcyonidium diaphinum* (common) and *Parazonathus anguicomus* (occasional). *Clathria barleei* present (occasional).

Site 52 – North of East Maiden, 54° 55.858N, 005° 43.769'W

070817/04

Gently sloping boulders (25% large and 50% small) interspersed with patches of shell gravel at the deeper points of the slope (depth surveyed 25-33m BSL). Boulders covered with bryozoans, particularly *Securiflustra securifrons*, *Alcyonidium diaphanum* and *Celleria sinuosa* and encrusting species. Other common species present were *Tubularia indivisa*, *Alcyonium digitatum* and *Caryophyllia smithii*. The hydroids *Polyplumaria flabellata*, *Aglaophenia tubulifera* and *Nemertesia antennina* were frequent and *Diphasia alata*, *D. fallax*, *Sertularia argentea*, *Sertularella gayi* and *Lytocarpia myriophyllum* occasional.

Site 53 – North-East of East Maiden 54° 55.770'N, 005° 43.661'W

080821/03

Kelp forest on steeply sloping bedrock and boulders with dense crustose corallines on rock surfaces. Depth 12-14m BSL. Upper facing surfaces and lower kelp stipes with dense *Tubularia indivisa* (abundant) and lots of associated biota. Verticals with anthozoans included small (but some dense) *Corynactis viridis* and scattered *Actinothoe sphyrodeta*, *Hormathia coronata* and *Caryophyllia smithii*. Upper parts of kelp stipes with epiphytes including *Phycodrys rubens* and *Cryptopleura ramosa*.

Site 54 East of East Maiden, 54° 55.771'N, 005° 43.530'W

080822/01

Vertical rock with some ledges and crevices. Depth 30-34m BSL. Cover encrusting and massive sponges (species included *Myxilla fimbriata*, *Iophon hyndmani* and *Axinella infundibuliformis*), *Caryophyllia smithii* (abundant), encrusting bryozoans (common), *Alcyonium digitatum* and *Tubularia indivisa* (frequent).

Site 55 North-East East Maiden, 54° 55.766'N, 005° 43.552'W

060815/04

23-31m BSL. 30% bedrock, 30 boulders, 10 cobbles, 20 gravel, 10 sand. Mainly upper faces with 10%



Figure 28 - Sites 64-77, the Saddle, the Bushes, the Sheafing Rock

vertical. Characterised by the hydroids *Polyplumaria flabellata* (C), *Diphasia alata* (c) and *Diphasia nigra* (r). *Alcyonium digitatum* common as were encrusting sponges.

Site 56 North-East East Maiden, 54° 55.769'N, 005° 43.524'W

080820/01

Silted bedrock on a moderate slope from 25-27m BSL surveyed. Cover mainly *Alcyonium digitatum* (common), *Caryophyllia smithii* (abundant), hydroids and bryozoans. characterising hydroids included *Polyplumaria flabellata*, *Nemertesia antennina*, *Aglaophenia tubulifera* (frequent), *Diphasia alata*, *Diphasia fallax* (rare). The dominant bryozoans were *Crisia cornuta* (common), *Alcyonidium diaphinum* and *Securiflustra securifrons* (frequent). Several plant species were present in low abundance, the most common was *Schottera nicaeensis*. Small patches of sponge were present with encrusting species on vertical rock faces. After surveying this depth range the divers swam up the slope, *Tubularia indivisa* became dominant at 23m BSL and *Laminaria hyperborea* first occurred at 21m BSL, these shallower depth ranges were not surveyed in detail.

Site 57 East of East Maiden, 54° 55.734'N, 005° 43.536'W

060807/04

19-24.6m BCD, bedrock (30%), boulders (30% large and 20% small) and coarse sand (20%). 60% upper and 40% very steep faces. Dominated by hydroids - *Aglaophenia tubulifera* (abundant), *Tubularia indivisa* (frequent), *Sertularia argentea* (frequent), *Polyplumaria flabellata* (occasional) and *Diphasia alata* (occasional). Other characterising species *Alcyonium digitatum* (frequent) *Stelligera stuposa* (frequent), and *Alcyonidium diaphinum* (Abundant).

Site 58 East of East Maiden, 54° 55.705'N, 005° 43.501'W

070817/03

Steeply sloping boulder slope 28-35m surveyed, but extends to 40m+. At end of dive, bedrock reef - steep sided (to north of entry point). Boulders densely covered with *Tubularia indivisa* (abundant); patches of *Parazoanthus anguicomus* (common) on undersides.

Site 59 SE East Maiden, 54° 55.642'N, 005° 43.544'W

060815/05

Bedrock with vertical (50%) and upper (50%) faces. 15% small boulders. Depth 20-30m. Characterising species *Alcyonium digitatum*, *Tubularia indivisa* and foliose red algae.

Site 60 South of East Maiden 54° 55.655'N, 005° 43.729'W

080814/02

Depth surveyed 20-22m Small boulders (30%), cobbles (30%), pebbles (10%), gravel, silty shell sediment and foliose algae including *Rhodothamniella floridula*, *Bonnemasonia asparagoides*, *Rhodophyllis divaricata*, *Delesseria sanguinea*. Crustose corallinaceae also common. Notable animal species included *Alcyonium digitatum* (frequent), *Caryophyllia smithii* (frequent) and *Nemertesia antennina* (occasional).

Site 61 East of the Saddle 54° 55.594'N, 005° 43.525'W

080620/01

Slope of small and medium boulders spanning lower infralittoral and upper circalittoral at 19-26m BCD. *Laminaria hyperborea* present - very sparse at 19m. Red foliose algae, particularly *Delesseria sanguinea*, *Plocamium cartilagineum*, and *Phyllophora crispa*, common at 19m and occasion at 26m. *Alcyonium digitatum* and *Caryophyllia smithii* abundant. Large variety of hydroids present including *Nemertesia antennina* and *Nemertesia ramosa*, *Tubularia indivisa*, *Halecium halecinum*, *Diphasia attenuata* (all frequent) and *Aglaophenia tubulifera* (common). Variety of hydroids was much greater in shallower areas (19-22m BCD).

Site 62 East of the Saddle 54° 55.569'N, 005° 43.515'W

080724/02

Steep boulder slope (25-33m BCD surveyed) composed of very large (10%), large (80%) and small (10%) boulders. Dominated by hydroids including *Nemertesia ramosa* (common), *Nemertesia antennina* and *Tubularia indivisa* (frequent). *Caryophyllia smithii* abundant and *Alcyonium digitatum* common. *Parazoanthus anguicomus* present under boulders.

Site 63 SE of the Saddle, 54° 55.549'N, 005° 43.537'W

070820/01

Steep slope of angular boulders, mainly small (65%), but around 20% very large (27-31.5m BCD surveyed). Characterising species *Caryophyllia smithii* (abundant), *Tubularia indivisa* and *Parazoanthus anguicomus* (frequent). *P. anguicomus* mainly present on overhangs and *Tubularia indivisa* on upper surface of boulders. Many wrasse present. *Polyplumaria flabellata* and *Diphasia alata* present but on one boulder only (at approximately 28m BCD).

Site 64 West of the Bushes, 54° 55.540'N, 005° 43.938'W

070813/04 and 080721/02

Gentle mixed boulder slope, 23-29m BCD surveyed, in deeper areas the slope was less steep and boulders were interspersed with shelly gravel. Upper parts dominated by *Tubularia indivisa*, in deeper areas boulders covered with *Alcyonium digitatum* and *Caryophyllia smithii*. Occasional patches of *Lytocarpia myriophyllum*, *Polyplumaria flabellata* and *Diphasia alata*. Bryozoans common, mainly *Celleria fistulosa*, *C. sinosa* and encrusting species. Other hydroids present included *Aglaophenia tubulifera*, *Nemertesia antennina* and *N. ramosa*.

Site 65 West of the Saddle 54° 55.490'N, 005° 43.914'W

080819/02

Bedrock, mainly upper faces (85%) with 10% large boulders and 10% shell gravel. 25-30m BCD surveyed. Dominated by hydroids, *Alcyonium digitatum* (frequent) and *Caryophyllia smithii* (common). Hydroid species included *Aglaophenia tubulifera* (common), *Tubularia indivisa*, *Nemertesia ramosa*, and *Polyplumaria flabellata* (all frequent).

Site 66 South-west of the Saddle, 54° 55.491'N, 005° 49.952'W

080721/02

Bedrock 23-29m BCD. Main cover hydroids including *Aglaophenia tubulifera* (frequent), *Nemertesia antennina* (common), *Polyplumaria flabellata* and *Diphasia alata* (occasional) The nudibranch *Caloria elegans* was recorded.

Site 67 West of the Sheafing Rock 54° 55.301'N, 005° 44.002'W

080819/04

Bedrock, mainly upper faces (95%), with some cobbles (5%), pebbles (5%), shell gravel (5%) and sand (5%). Characterising species *Polyplumaria flabellata*, *Aglaophenia tubulifera* and *Nemertesia ramosa* (all frequent).

Site 68 North of the Sheafing Rock 54° 55.253'N, 005° 43.955'W

060816/06, 060807/02

Flat seabed from 16-18m BSL. Fine sand (30%) with pebbles (10%), shell gravel (10%) and maerl (20% dead and 30% live). *Pecten maximus* frequent. Kelp park (*Laminaria saccharina*) and mixed red seaweeds. The Northern Ireland Priority Seaweed *Desmarestia dresnayi* was frequent.

Site 69 NE the Sheafing Rock, 54° 55.239'N, 005° 43.918'W

060807/01

Mixed boulders (roughly even quantities of very large, large and small) with a small amount of cobbles and shell gravel. Boulders stable and moderately silted. Depth at site 10-20m. Dominant animal cover *Tubularia indivisa* (abundant) and *Alcyonium digitatum* (common). Kelp park of *Laminaria saccharina* (common) and a turf of mixed seaweeds also present, species including: *Trailliella intricata* (abundant), *Delessaria sanguinea*, *Dictyota dichotoma* (common) *Callophyllis laciniata*, *Kallymenia reniformis*, *Acrosorium venulosum*, and *Heterosiphonia plumosa* (all frequent). *Desmarestia dresnayi*, a Northern Ireland priority species was frequent.

Site 70 NW of the Sheafing Rock, 54 55.319'N, 005 43.943'W

080815/02

Pebbles, gravel and shell sand with brown foliose algae and some reds. Conspicuous species included *Laminaria saccharina*, *Laminaria* sporelings, *Dictyota dichotoma* and Crustose corallines.

Site 71 West of the Sheafing Rock 54° 55.223'N, 005° 44.001'W

080819/03

Gravel plain with sand (20%) and maerl fragments (approximately 3% dead and 2% live maerl). Depth surveyed 26-29m BCD. Sparse foliose algae including *Halarachnion ligulatum*, *Stenogramme interrupta* and *Acrosorium venulosum*. Animal species present included *Pecten maximus*, *Alcyonidium diaphanum*, *Pomatoceros triquetter*, *Balanus crenatus*, *Hormathia coronata* and *Nemertesia* spp but none abundant (all occasional/rare).

Site 72 West of the Sheafing Rock 54° 55.239'N, 005° 43.198'W

080813/03

Fairly level seabed at 20m BCD. Composed of cobbles (20%), pebbles (20%), stone and shell gravel (40%) and muddy sand (20%) with foliose red algae and clumps of *Tubularia indivisa* (common), *Alcyonium digitatum* (frequent) and encrusting bryozoans. Of interest was the algae *Schmitzia hiscockiana* (occasional), this is a Northern Ireland Priority Species.

Site 73 East of the Sheafing Rock 54° 55.276'N, 005° 43.635'W

060817/06

Bedrock, mainly (90%) upper faces with a small amount of cobbles and sand (10%). Depth 20-30m. Dominated by *Tubularia indivisa*, *Alcyonium digitatum* and foliose red algae.

Site 74 SE of the Sheafing Rock 54° 55.153'N, 005° 43.722'W

070820/02

Boulder slope of very large (10%), large (22%) and small (30%) boulders, interspersed with shell gravel (5%), sand (30%) and a small amount of mud (2%). The slope ended on flat silty sand at 30m (BCD). Silt was present on most boulders. *Caryophyllia smithii* and *Alcyonium digitatum* were common on top of the boulders with *Alcyonidium diaphanum* present inbetween them. Many hydroids, including *Diphasia pinnaster*, *Diphasia alata*, *Diphasia nigra*, *Nemertesia antennina*, *Lytocarpia myriophyllum* and *Polyplumaria flabellata* were present.

Site 75 South of the Sheafing Rock 54° 54.973'N, 005° 43.910'W

080813/04

Bedrock steps (very angular) and ridges interspersed with areas of small boulders, cobbles and shell gravel. 24-26.5m BCD surveyed. Cobbles covered with *Parazoanthus anguicomus*. Bedrock dominated by *Tubularia indivisa* and *Alcyonium digitatum*. Some interesting sponges including *Lissodendoryx (Ectyodoryx) jenjonesae* and *Hymedesmia stellifera*. Some very large patches of *Haliclona viscosa*.

Site 76 SW of the Sheafing Rock, 54° 54.968'N, 005° 44.296'W

080721/01

Bedrock outcrops forming high mounds - top of highest was 21m, bottom 29m+. Some small boulders in between bedrock and a few patches of gravel. Whole area very tideswept. Rock covered in *Tubularia indivisa*, *Alcyonium digitatum* and *Corynactis viridis*.

Site 77 East of the Bushes 54° 55.353'N, 005° 43.617'W

080724/01

Steep boulder slope, 25-29m BCD surveyed, but slope continued down to approx. 35m. Slope composed of very large and large angular boulders, almost cubic. Some small patches of sand between boulders. Cover *Tubularia indivisa*, *Alcyonium digitatum* (common), *Caryophyllia smithii* (abundant), *Nemertesia ramosa* and *N. antennina*. *Parazoanthus anguicomis* frequent on boulders. *Lytocarpia myriophyllum* occasional.

Species list for Maidens

Species lists are taken from diving records from the Marine Recorder database. This includes data from the Northern Ireland Sublittoral Survey and Seasearch surveys as well as this project. Only macrofauna and algae were recorded. Additional sponge species were added from the museum SSNI Access database (some species cannot yet be entered into Marine Recorder as their names are not on the database species lists). Northern Ireland Priority Species are in bold, Northern Ireland Species of Conservation Concern are underlined, those of note but not in either of these two categories are marked with an asterisk. Details on these species are given in the following section.

Annelida – Annelid Worms

Chaetopterus variopedatus, *Eupolymnia nebulosa*, *Filograna implexa*, *Lanice conchilega*, *Myxicola infundibulum*, *Pomatoceros lamarcki*, *Pomatoceros triqueter*, *Sabella pavonina*, *Spirorbis spirorbis*

Brachiopoda - Brachiopods

Terebratulina retusa

Bryozoa – Bryozoans

Alcyonidium diaphanum, *Bicellariella ciliata*, *Bugula avicularia*, *Bugula flabellata*, *Bugula plumosa*, *Bugula purpuroincta*, *Bugula turbinata*, *Buskea dichotoma*, *Caberea ellisii*, *Cellaria fistulosa*, *Cellaria sinuosa*, *Cellepora pumicosa*, *Crisia aculeata*, *Crisia denticulata*, *Crisia eburnea*, *Crisidia cornuta*, *Electra pilosa*, *Eucratea loricata*, *Flustra foliacea*, *Membranipora membranacea*, *Nolella dilatata*, *Omalosecosa ramulosa*, *Parasmittina trispinosa*, ***Pentapora foliacea***, *Plagioecia patina*, *Porella compressa*, *Schizomavella* sp., *Schizomavella linearis*, *Scrupocellaria* sp., *Securiflustra securifrons*, *Turbicellepora* sp., *Turbicellepora avicularis*, *Vesicularia spinosa*

Algae

Chlorophycota - Green Algae

Bryopsis plumosa, *Chaetomorpha melagonium*, *Ulva compressa*, *Ulva* sp.

Chromophycota - Brown Algae

Alaria esculenta, ***Carpomitra costata***, *Chorda filum*, *Cutleria multifida*, *Desmarestia aculeata*, ***Desmarestia dresnayi***, *Desmarestia viridis*, *Dictyota dichotoma*, *Ectocarpaceae*, *Halidrys siliquosa*, *Halopteris filicina*, *Laminaria digitata*, *Laminaria hyperborea*, *Laminaria saccharina*, *Litosiphon* spp., *Saccorhiza polyschides*, *Sporochnus pedunculatus*, *Taonia atomaria*

Rhodophycota - Red Algae

Acrosorium venulosum, *Apoglossum ruscifolium*, *Audouinella* sp., *Bonnemaisonia asparagoides*, *Brongniartella byssoides*, *Calliblepharis ciliata*, *Callophyllis laciniata*, *Compsothamnion thuyoides*, *Corallina officinalis*, *Corallinaceae*, *Cryptopleura ramosa*, *Delesseria sanguinea*, *Dilsea carnosa*, *Drachiella spectabilis*, *Erythroglossum laciniatum*, *Gracilaria gracilis*, *Halarachnion ligulatum*, *Halurus flosculosus*, *Haraldiophyllum bonnemaisonii*, *Heterosiphonia plumosa*, *Hypoglossum hypoglossoides*, *Kallymenia reniformis*, *Lithophyllum*, *Lithothamnion*, *Lomentaria clavellosa*, *Lomentaria orcadensis*, *Membranoptera alata*, *Meredithia microphylla*, *Odonthalia dentata*, *Palmaria palmata*, *Phycodrys rubens*, *Phyllophora crispa*, *Phyllophora pseudoceranooides*, *Phymatolithon calcareum*, *Plocamium cartilagineum*, *Polysiphonia*, *Polysiphonia stricta*, *Pterothamnion crispum*, *Pterothamnion plumula*, *Ptilota gunneri*, *Radicilingua thysanorhizans*, *Rhodophycota*, *Rhodophyllis*, *Rhodophyllis divaricata*, *Rhodophyllis divaricata* var. *wernerii*, *Rhodothamniella floridula*, *Rhodymenia ardissoni*, *Rhodymenia holmesii*, *Rhodymenia pseudopalmata*, *Schmitzia hiscockiana*, *Schottera nicaeensis*, *Sphaerococcus coronopifolius*, *Sphondylothamnion multifidum*, *Stenogramme interrupta*

Cnidaria

Hexacorallia – Anemones and True Corals

Actinothoe sphyrodeta, *Adamsia carciniopados*, *Anemonia viridis*, *Aureliania heterocera*, *Caryophyllia smithii*, *Cerianthus lloydii*, *Corynactis viridis*, *Epizoanthus couchii*, *Hormathia alba*, *Hormathia coronata*, *Mesacmaea mitchellii*, *Metridium senile*, *Parazoanthus anguicomus*, *Peachia cylindrica*, *Phellia gausapata*, *Sagartia elegans*, *Sagartiogeton laceratus*, *Sagartiogeton undatus*, *Urticina eques*, *Urticina felina*

Octocorallia – Sea pens, sea fans and soft corals

Alcyonium digitatum, *Virgularia mirabilis*

Leptolida - Hydroids

Abietinaria abietina, *Aglaophenia pluma*, *Aglaophenia tubulifera*, *Antennella secundaria*, *Bougainvillia ramosa*, *Clytia hemisphaerica*, *Corymorpha nutans*, ***Diphasia alata***, *Diphasia attenuata*, *Diphasia fallax*, ***Diphasia nigra***, *Diphasia pinaster*, *Diphasia rosacea*, *Eudendrium* sp., *Eudendrium annulatum*, *Garveia nutans*, *Gonactinia prolifera*, *Halecium halecinum*, *Halecium muricatum*, ***Halecium plumosum***, *Halopteris catharina*, *Hydrallmania falcata*, *Kirchenpaueria pinnata*, ***Lytocarpia myriophyllum***, *Nemertesia antennina*, *Nemertesia ramosa*, *Obelia dichotoma*, *Obelia geniculata*, *Obelia longissima*, *Plumularia setacea*, ***Polyplumaria flabellata***, *Polyplumaria frutescens*, *Rhizocaulus verticillatus*, *Sertularella gayi*, *Sertularella polyzonias*, *Sertularia argentea*, *Sertularia cupressina*, *Tubularia indivisa*, *Tubularia larynx*

Crustacea - Crustaceans

Anapagurus hyndmanni, *Balanus balanus*, *Balanus crenatus*, *Cancer pagurus*, *Caprella linearis*, *Caprellidae*, *Carcinus maenas*, *Colomastix pusilla*, *Crangon crangon*, *Ebalia tuberosa*, *Eurynome* sp., *Galathea* sp., *Galathea intermedia*, *Galathea nexa*, *Galathea squamifera*, *Galathea strigosa*, *Homarus gammarus*, *Hyas araneus*, *Hyas coarctatus*, *Inachus dorsettensis*, *Inachus phalangium*, *Liocarcinus depurator*, *Liocarcinus pusillus*, *Macropodia rostrata*, ***Munida rugosa***, *Necora puber*, *Nephrops norvegicus*, *Pagurus bernhardus*, *Pagurus prideaux*, *Pandalus montagui*

Echinodermata

Amphipholis squamata, *Amphiura brachiata*, *Amphiura chiajei*, *Amphiura filiformis*, ***Anseropoda placenta***, *Antedon bifida*, *Antedon petasus*, *Asterias rubens*, *Crossaster papposus*, *Echinus esculentus*, *Henricia oculata*, *Leptasterias muelleri*, *Luidia ciliaris*, *Marthasterias glacialis*, *Neopentadactyla mixta*, *Ophiocomina nigra*, *Ophiopholis aculeata*, *Ophiothrix fragilis*, *Ophiura albida*, *Ophiura ophiura*, *Pawsonia saxicola*, *Porania pulvillus*, *Psammechinus miliaris*, *Stichastrella rosea*

Mollusca**Aplacophora – shell-less mollusc***Rhopalomenia aglaopheniae***Pelecypoda – Bivalve Mollusca***Aequipecten opercularis, Astarte sulcata, Chlamys distorta, Circomphalus casina, Lutraria lutraria, Pecten maximus, Pododesmus patelliformis***Polyplacophora - Chitons***Leptochiton cancellatus***Gastropoda – Gastropod shelled molluscs***Aporrhais pespelecani, Calliostoma zizyphinum, Calliostoma zizyphinum var. lyonsii, Gibbula cineraria, Gibbula tumida, Helcion pellucidum, Hinia incrassata, Hinia reticulata, Lacuna pallidula, Lacuna parva, Ocenebra erinacea, Polinices pulchellus, Tricolia pullus, Trivia arctica, Trivia monacha***Gastropoda - Sea slugs***Acanthodoris pilosa, Aplysia punctata, Archidoris pseudoargus, Cadlina laevis, Caloria elegans*, Colpodaspis pusilla, Coryphella browni, Coryphella lineata, Coryphella verrucosa, Dendronotus frondosus, Diaphorodoris luteocincta, Doto sp (new species), Doto dunnei, Doto fragilis, Doto hystrix, Doto pinnatifida, Doto tuberculata, Elysia viridis, Eubranchus tricolor, Facelina bostoniensis, Favorinus blianus, Flabellina pedata, Goniodoris nodosa, Janolus cristatus, Jorunna sp.*, Jorunna tomentosa, Limacia clavigera, Okenia aspersa, Okenia elegans*, Onchidoris depressa, Onchidoris oblonga, Polycera faeroensis, Polycera quadrilineata, Tritonia hombergii, Tritonia lineata,***Cephalopoda - Octopus***Eledone cirrhosa.***Nemertea – Nemertean worms***Lineus longissimus, Tubulanus annulatus***Phoronida – Horseshoe worms***Phoronis hippocrepia***Fish***Agonus cataphractus, Ammodytes tobianus, Callionymus lyra, Callionymus reticulatus, Centrolabrus exoletus, Chirolophis ascanii, Conger conger, Crenilabrus melops, Ctenolabrus rupestris, Gadus morhua, Labrus bergylta, Labrus mixtus,**Merlangius merlangus, Nerophis lumbriciformis, Parablennius gattorugine, Pholis gunnellus, Phrynorhombus norvegicus, Pleuronectes platessa, Pollachius pollachius, Pollachius virens, Pomatoschistus minutus, Pomatoschistus pictus, Scyliorhinus canicula, Spinachia spinachia, Syngnathus acus, Taurulus bubalis, Thorogobius ephippiatus, Trisopterus minutus, Zeugopterus punctatus, Zeus faber*

Porifera – Sponges

Antho involvens, *Antho brattegardii**, *Amphilectus fucorum*, *Aplysilla rosea*, *Aplysilla sulfurea*, *Axinella dissimilis*, *Axinella infundibuliformis*, *Axinella parva**, *Axinella pyramidata**, *Chelonaplysilla noevus*, ***Clathria barleei***, *Clathrina coriacea*, *Cliona celata*, *Crella*, *Desmacella cf annexa*, *Dercitus bucklandi*, *Dysidea fragilis*, *Ectyodoryx*, *Eurypon* (several undescribed species), *Eurypon major*, *Eurypon* sp 2, *Eurypon* sp 4, *Grantia compressa*, *Guancha lacunosa*, *Halichondria bowerbanki*, *Halichondria panicea*, *Haliclona cinerea*, *Haliclona oculata*, *Haliclona urceolus*, *Haliclona viscosa*, *Halisarca dujardini*, *Halicnemias* sp A, *Hemimycale columella*, *Hymedesmia* (several unnamed species) *Hymedesmia (Stylopus)* spp., *Hymedesmia cohesibacilla**, *Hymedesmia jecusculum*, *Hymedesmia paupertas*, *Hymedesmia peachii**, *Hymedesmia primitiva**, *Hymedesmia rathlinia**, *Hymedesmia stellifera**, *Hymeniacion* *simplicima*, *Hymeraphia breeni**, ***Hymerhabdia typica***, ***Iophon hyndmani***, *Iophon nigricans*, *Leucosolenia* sp, *Lissodendoryx (Ectodoryx) jenjonesae**, ***Microciona elliptichela***, *Microciona spinarcus*, *Microciona strepsitoxa*, *Microciona* (unidentified species), *Mycale rotalis*, *Myxilla fimbriata*, *Myxilla incrustans*, *Myxilla cf. rosacea*, *Oscarella* sp, *Oscarella lobularis*, *Pachymatisma johnstonia*, *Phakellia rugosa*, *Plocamionida ambigua*, *Plocamionida* sp B, ***Plocamiancora arndti***, *Plocamionida tylotata**, *Phorbas fictitius*, *Polymastia*, *Polymastia boletiformis*, *Polymastia penicillus*, *Raspailia hispida*, *Raspailia ramosa*, *Rhaphidostyla kitchingi*, *Scypha ciliata*, *Scypha elegans*, *Spanioplone armaturum*, *Sphaerotylus*, ***Spongionella pulchella***, *Spongosorites*, *Stelligera rigida*, *Stelligera stuposa*, *Styloptilon anchoratum**, *Suberites*, *Suberites carnosus*, *Suberites ficus*, *Tethya citrina*, *Tethya hibernica**, *Tethyspira spinosa*, *Ulosa digitata*

Tunicata – Sea squirts

Aplidium nordmanni, *Aplidium punctum*, ***Archidistoma aggregatum***, *Ascidia conchilega*, *Ascidia mentula*, *Ascidia virginea*, *Ascidiella aspersa*, *Ascidiella scabra*, ***Boltenia echinata***, *Botrylloides leachi*, *Botryllus schlosseri*, *Ciona intestinalis*, *Clavelina lepadiformis*, *Clavelina* sp – pin head squirt*, *Corella parallelogramma*, *Dendrodoa grossularia*, *Didemnidae*, *Didemnum maculosum*, *Lissoclinum perforatum*, *Molgula manhattensis*, *Molgula occulta*, *Morchellium argus*, *Polycarpa fibrosa*, *Polycarpa pomaria*, *Polycarpa scuba*, *Polyclinum aurantium*, *Pyura squamulosa*, *Pyura tessellata*, *Sidnyum elegans*, *Sidnyum turbinatum*, ***Synoicum incrustatum***, *Synoicum pulmonaria*

Northern Ireland Conservation Priority species (NICP), Species of Conservation Concern (SOCC) and other species of note present on the Maidens.

Porifera

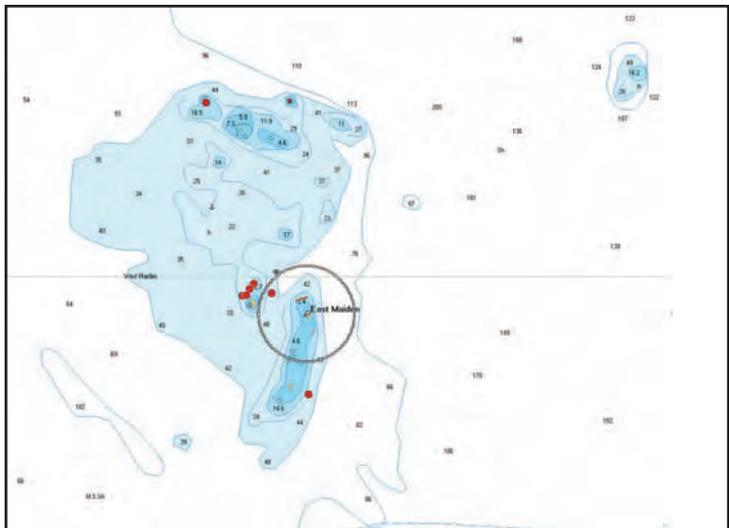
***Axinella dissimilis* (Bowerbank, 1866) (SOCC)**

Recorded during SSNI from Rathlin (Picton’s Reef and Slope East of Illancarragh Bay on the east coast, Damicornis Bay on the south coast, and Duncan’s Bay and West of Derginan point on the north wall), the Maidens (Russells Rock and NW of West Maiden), and the Skerries (East and NW of Black Rock, NW of Large Skerrie, N of the Stork). Additional Maidens records were made during the 2008 survey.

This sponge has a southern distribution and is consequently not very common in Northern Ireland. There are recent records from SW Britain as far as Anglesey and along the west coast of Ireland around to Rathlin (there is one MNCR record from off Fleetwood but this is doubtful). There are verified Scottish records from Mull and Loch Scridain (MNCR, Ackers et al. 2007), although there are several other records from the Scottish west coast which require verification (Seasearch). *A. dissimilis* can be confused with other large, yellow, branching sponges such as *Haliclona oculata* and *Raspailia hispida*. The Maidens records represent an increase in its range in Northern Ireland (previously known only from the Skerries and Rathlin Island), this could be related to climate change.



Axinella dissimilis



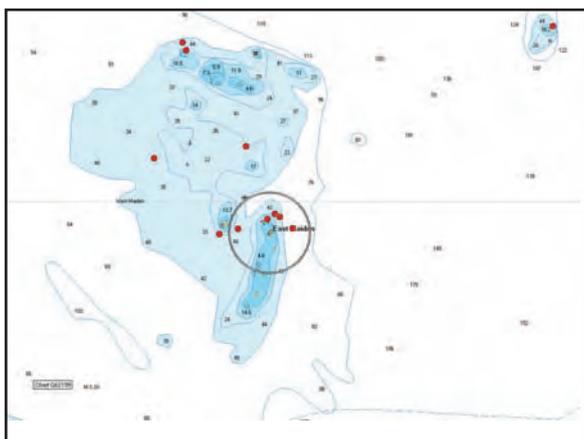
Axinella dissimilis distribution

***Clathria barleei* (Bowerbank, 1866) (NICP)**

A northern deepwater species distributed from the Arctic to the Atlantic coasts of France. Only known in Northern Ireland from Rathlin and the Maidens. Although there are records from Rathlin from 1980-1990 this species was not found on the recent sponge survey (Picton & Goodwin 2007a,b) but there were some records during SSNI (Goodwin et al. 2011).



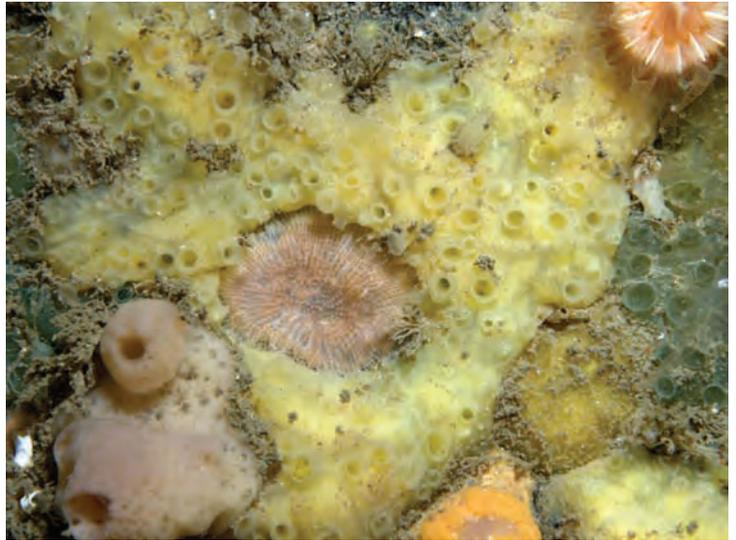
Clathria barleei



Clathria barleei distribution

***Lissodendoryx (Ectyodoryx) jenjonsae* Picton and Goodwin 2007**

This species was described from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a,b), during which fifteen specimens were collected. During SSNI eleven further specimens were collected, all from the Maidens. Four further specimens were collected from the Maidens during this project. This is a species which, unlike many other crustose sponge species, may be easily recognised *in situ*: the raised rims to the pore sieves and the thick form of the crust are distinctive.



Ectyodoryx jenjonsae

***Hymedesmia (Hymedesmia) stellifera* Goodwin and Picton, 2009**

This species was described from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a,b; Goodwin & Picton 2009), during which two specimens were collected. Two further specimens were collected during SSNI from the Maidens, and an additional two specimens in 2008. The two SSNI specimens are listed as paratypes in the species description. *H. stellifera* is also present in the Firth of Lorn in Scotland.



Hymedesmia stellifera

***Iophon hyndmani* (Bowerbank, 1858) (NICP)**

Listed as a priority species because of its association with the horse mussel beds in Strangford Lough. It underwent decline in Strangford due to the damage to this habitat. It is now apparent it is not restricted to this habitat and is common on all Northern Ireland coasts, it has been recommended that it is removed from the NICP species list (Goodwin et al. 2011).



Iophon hyndmani

***Microciona elliptichela* (Alander, 1942) (NICP)**

This species was originally known in Northern Ireland from only one record from Rathlin Island. Despite intensive sampling this species was not recorded during the Sponge Biodiversity of Rathlin Island Project. During SSNI one sample was taken from Rathlin and three further samples from the Maidens (East of West Maiden, West of the Bushes, Russel’s Rock). Two further specimens were taken from the Maidens in 2008: SW of the Saddle and S of West Maiden. This species is not in the UK species directory and it had therefore not been possible to add records to Marine Recorder, although they are on the SSNI access database.



Microciona elliptichela

***Plocamiancora arndti* Alander, 1942 (SOCC)**

This species appears to be reasonably common on the Maidens, 19 records were made during SSNI and this survey. It was first described from Sweden and is thought to have a restricted distribution in the British Isles: other than Northern Ireland it is known only from the west coast of Scotland. Prior to SSNI it was known in Northern Ireland from Rathlin Island and Carnlough Bay in Antrim (NISS, Picton & Goodwin 2007a, b). Despite sponges from the Maidens having been sampled during NISS there were no prior records from this area. However, sponges were not a priority during this general survey and this may be due to low sampling effort. Targeted sponge sampling in other areas of the UK is needed to give an accurate indication of its distribution.



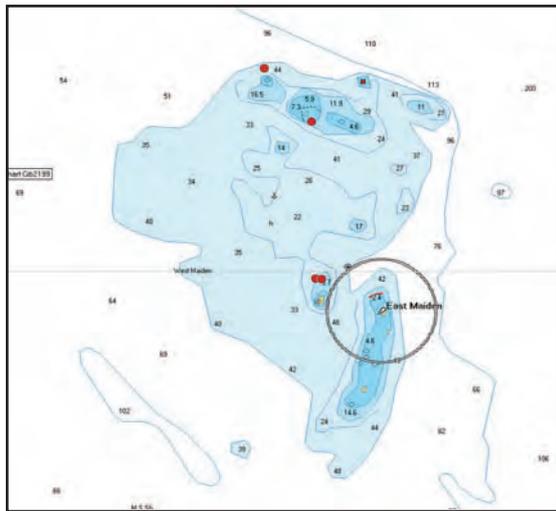
Plocamiancora arndti

***Hymerabdia typica* Topsent 1892 (NICP)**

This is primarily a southern species; known from the Mediterranean, Azores and Roscoff. It is not known from anywhere in the UK apart from Northern Ireland. Rathlin Island was previously the only Northern Ireland location this species was known from. One record from NW of East Maiden (dive 080820/02).



Hymerabdia typica



Spongionella pulchella distribution
***Spongionella pulchella* (Sowerby, 1806)(SOCC)**

Recorded from Farganlack point on Rathlin and four sites in the Maidens (SE East Maiden, SE Allen's Rock, NW Allen's Rock and NE West Maiden). There are previous Northern Ireland records from the Maidens, Rathlin and the North Antrim Coast and the species appears to be widespread but local around the west coast of Ireland. This species is rarely recorded in the UK.

***Antho (Antho) brattegardi* van Soest & Stone, 1986**

This species was first recorded from the UK and Ireland during the 2005 BSP funded 'Sponge Biodiversity of Rathlin Island' project (Picton and Goodwin 2007a,b), during which ten specimens were collected from Rathlin Island. It was originally described from Norway from one specimen (van Soest & Stone 1986) but has since been recorded from offshore reefs at Mingulay (van Soest 2006). During SSNI there were three further records from Rathlin and two from the Maidens (East of East Maiden and SE West Maiden). There were four further records made during this survey (NE of East Maiden, S of the Sheafing Rock, N of Allen's Rock and East of the Saddle).

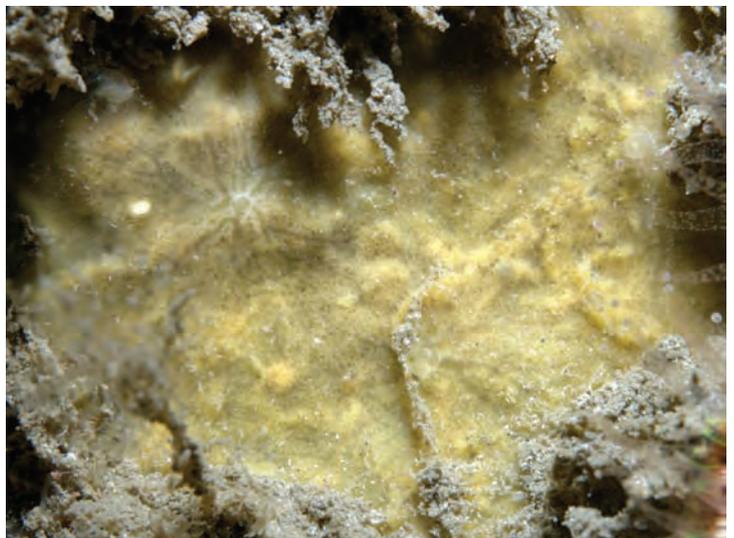
***Hymedesmia (Hymedesmia) cohesibacilla* Goodwin and Picton 2009**

This species was described from Rathlin Island during the 2005 BSP funded 'Sponge Biodiversity of Rathlin Island' project (Picton & Goodwin 2007a, Goodwin & Picton 2009), during which three specimens were collected.

During SSNI a further specimen was collected from the Maidens.



Spongionella pulchella



Antho brattegardi



Hymedesmia cohesibacilla

***Hymedesmia (Hymedesmia) peachii* Bowerbank, 1882**

This species was described from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a,b, Goodwin & Picton 2009), during which two specimens were collected. During SSNI two further specimens were collected, both from the Maidens (E of East Maiden and Russell’s Rock). During 2008 a further two specimens were collected from the Maidens (S of the Sheafing rock and Sw of the Saddle). This species is rarely recorded but widely distributed from northern British Isles to the Mediterranean, the type locality is Wick, NE Scotland.



Hymedesmia peachii

***Hymedesmia (Hymedesmia) rathlinia* Goodwin and Picton, 2009**

This species was described from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a, Goodwin & Picton 2009), during which twelve specimens were collected.

During SSNI a further specimen three specimens were collected from Rathlin and four from the Maidens. Several further photographic records have been made from the Maidens.



Hymedesmia rathlinia

***Hymedesmia (Stylopus) primitiva* Lundbeck, 1910**

This species was recorded from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a, Goodwin & Picton 2009), during which six specimens were collected. During SSNI six further specimens were collected from the Maidens and two from Rathlin. During 2008 one further specimen was taken from the Maidens. It appears to be one of the more common *Hymedesmia* species in the area.



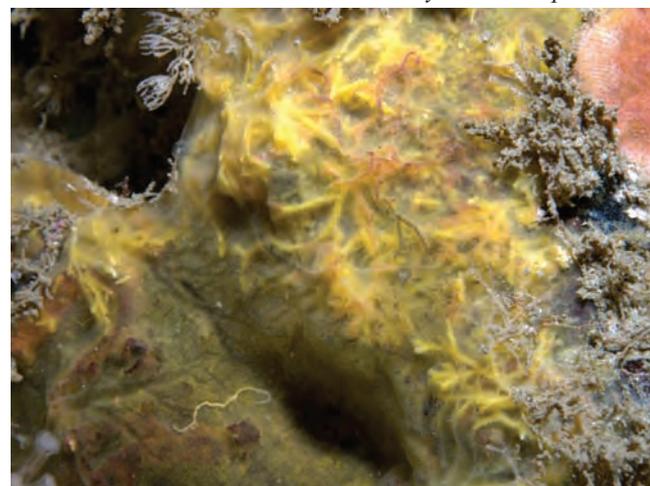
Hymedesmia primitiva

***Styloptilon anchoratum* (Cabiocch, 1968)**

This species was first described from the UK and Ireland from Rathlin Island, during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Picton & Goodwin 2007a,b), during which 31 specimens were collected.

It was originally described from Roscoff, France (Cabiocch 1968) There were previously unidentified specimens in Ulster Museum collection from Skomer Island, Wales, Ardnoe Point, Sound of Jura, Ballyhenry Island, Strangford Lough, Rathlin Island and North Water, Mulroy Bay.

During SSNI four further specimens were taken from Rathlin and eight from the Maidens. In 2008 a further specimen was taken from the Maidens.



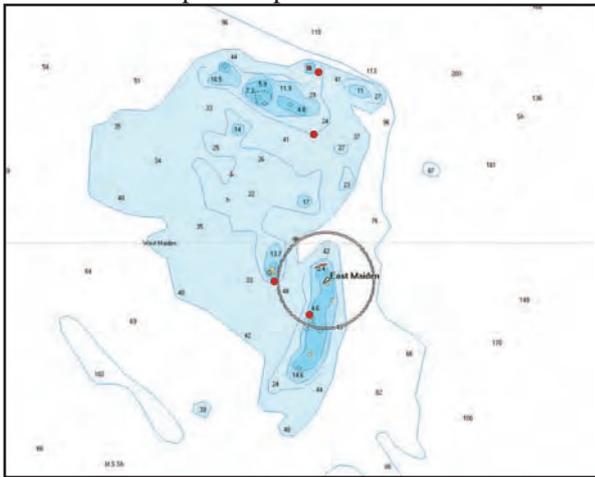
Styloptilon anchoratum

***Phakellia rugosa* (Bowerbank, 1862) (SOCC)**

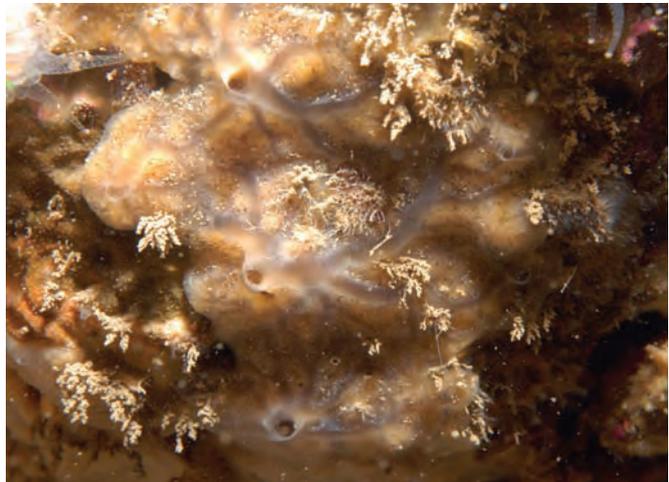
There is only one Northern Ireland record for this species. It was recorded from the Maidens (East of the Maidens, dive 850731/06) during the Northern Ireland Sublittoral Survey. This site was resurveyed during SSNI and the 2008 Maidens survey and the species was not found. It is a large conspicuous species and would have been recorded if present.

***Myxilla cf. rosacea* (Lieberkühn, 1859) (SOCC)**

Specimens of the SOCC sponge *Myxilla cf. rosacea* were collected: this sponge is possibly a distinct species from *Myxilla rosacea* which occurs on other areas of the Northern Ireland coast, differing in colouration, surface appearance, and the shape of the tornote ends. Further work is needed to determine if these two varieties are separate species.



Myxilla cf. rosacea distribution



Myxilla cf. rosacea

***Tethya hibernica* Heim, Nickel, Picton & Brümmer, 2007**

This species was described from Rathlin Island during the 2005 BSP funded ‘Sponge Biodiversity of Rathlin Island’ project (Heim, Nickel, Picton & Brümmer, 2007; Picton & Goodwin 2007a,b), during which five specimens were collected from Damicornis Bay on Rathlin Island. A further two specimens were collected during SSNI, also both from Damicornis Bay. Two specimens were collected during 2008 from the Maidens: NW of East Maiden (080820/02) and W of the Saddle (080819/02).

The genus *Tethya* was revised in the early 20th Century by Burton (1924) and Topsent (1918), several species were synonymised into *T. aurantium* and until recently it was believed that all European specimens were of this species (Ackers et al. 2007; Sarà 1987). See Picton and Goodwin 2007a for further details.



Tethya hibernica

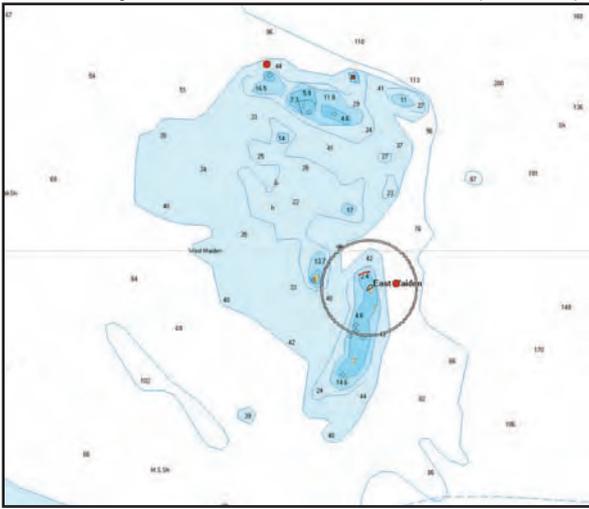
Tunicata

Archidistoma aggregatum Garstang, 1891 (SOCC)

Two records from the Maidens. Found in the UK from Plymouth and Salcombe in southern England north to the Irish Sea and North Channel. Probably under-recorded due to its inconspicuous appearance and small size. There are scattered previous Northern Ireland records along the north-east coast from Islandmagee to the Skerries. The NI records represent the majority of the Irish populations, in the Republic it is only recorded from Kerry Head and the Saltee Islands (BioMar).



Archidistoma aggregatum



Archidistoma aggregatum distribution

Boltenia echinata (Linnaeus, 1767) (SOCC)

One record from the Maidens (SE Allen’s Rock). This species is inconspicuous and is likely to be under-recorded. There are sparsely scattered previous records from Northern Ireland between Dundrum Bay and Rathlin Island. There are no records from the Republic of Ireland.



Boltenia echinata

Pycnoclavella sp. - Pin Head Squirt

Recorded from W of the Bushes, W of West Maiden, and Pin Head Pinnacle on the Maidens. There are previous UK records from Rathlin Island, Strangford Lough Murlough Bay and Fair Head in Country Antrim (NISS) and Pembrokeshire (PMSA).

Although small, this species is distinctive when seen in the field due to the white cross shaped marking on its head, from which its name derives. In some areas it was found to be very abundant, particularly on a formerly unnamed pinnacle west of the Maidens, which we have termed ‘Pin Head pinnacle’ in its honour. So far it has not been possible to find a scientific name for this species and it is likely that it is a new species of *Pycnoclavella*.



Pycnoclavella sp.

***Synoicum incrustatum* (M Sars, 1851) (SOCC**

One record from South-west of the Sheafing Rock. Also recently recorded from the Skerries and Duncan's Bay on Rathlin.

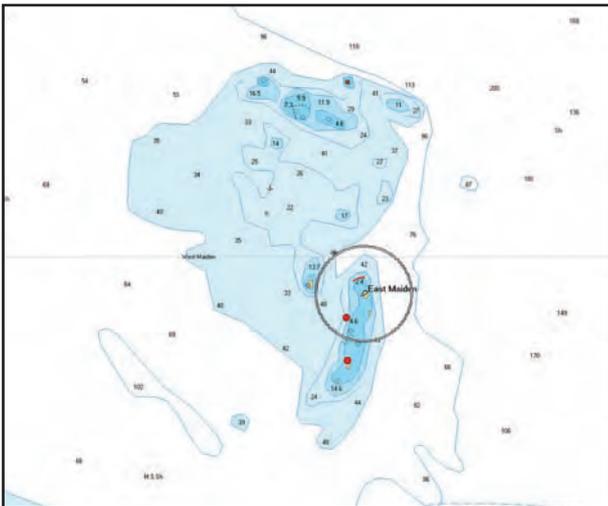


Synoicum incrustatum

Echinoderms

***Anseropoda placenta* (Pennant, 1777) Goosefoot starfish**

Known from a few sites on the Antrim coast, Rathlin and the Copeland Islands. Recently undergone rapid decline, vulnerable to damage by mobile fishing gear.



Anseropoda placenta distribution

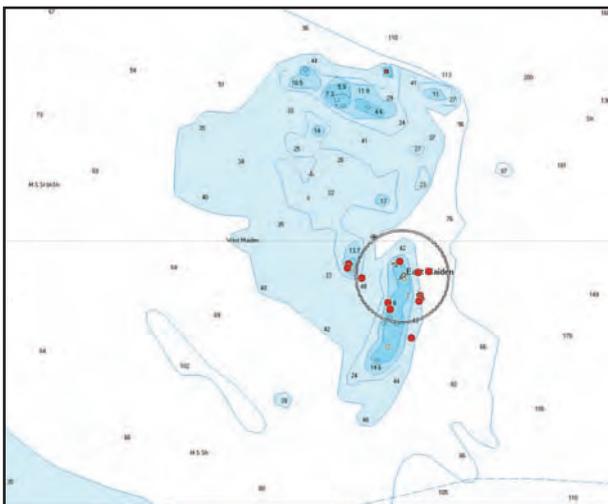


Anseropoda placenta

***Porania pulvillus* (O F Müller, 1776).**

(SOCC) Crimson Cushion Starfish

This species is present at several sites on the Maidens. It is also known in Northern Ireland from Rathlin Island, (records from the White Cliffs, Damicornis Bay and around Picton's reef on the east coast), East of Torr Head and Murlough Bay on the east Antrim coast.



Porania pulvillus distribution

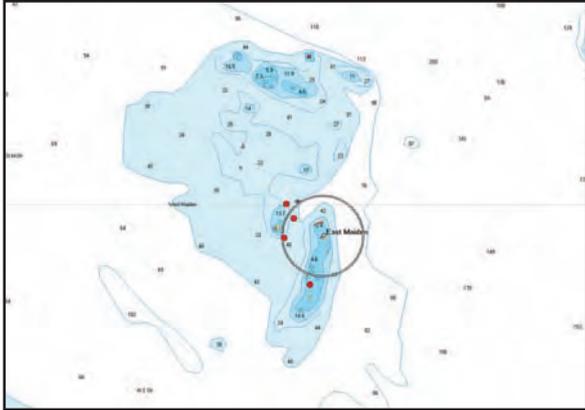


Porania pulvillus

Cnidaria

Aureliania heterocera (Thompson, 1853) (SOCC) - Emperor or Imperial anemone

Four records have been made from the Maidens for this species. It has also recently been recorded from SE of Long Sheelagh in Strangford, and Rathlin Island (from the south side of Rathlin; the White Cliffs and from Damicornis Bay).



Aureliania heterocera distribution



Aureliania heterocera

Diphasia alata (Hincks 1855) (NICP)

A reddish brown hydroid. The colony is pinnate with the main stem straight and thick and the side branches alternate. The side branches increase in length towards the colony's base, giving a triangular outline to the apex of the colony. Widely distributed from Norway to the Azores but only scattered records from the UK. Known in Northern Ireland from the Maidens and the east coast of Rathlin Island. The habitat on the east coast of Rathlin has been damaged (Picton and Goodwin 2007a), making the Maidens the Northern Ireland stronghold for this species. It is an important component of the *Polyplumaria flabellata* and *Diphasia alata* hydroid community



Diphasia alata distribution



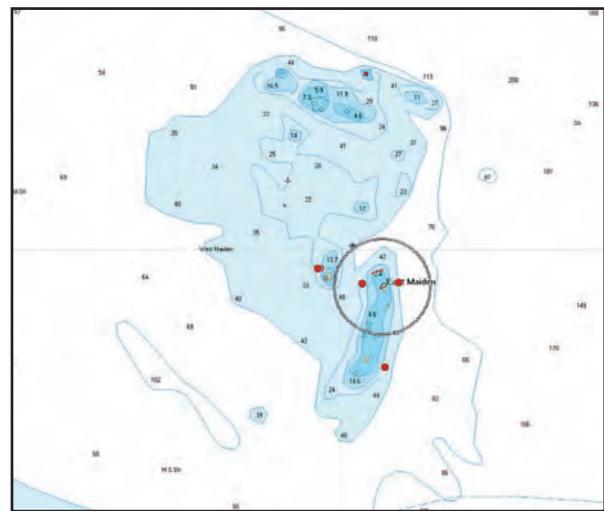
Diphasia alata

Diphasia nigra (Pallas, 1766) (NICP)

The hydroid stage is a very large (to around 20cm). The colony is branched in one plane, giving a robust, feather-like form. It is yellow or straw-coloured in life, when preserved or dried it turns black, which is the origin of its latin name. There are few records for the UK and Ireland, it is known mainly from deep water. In Northern Ireland it is only present on the Maidens and on the east coast of Rathlin Island. The habitat on the east coast of Rathlin has been damaged (Picton and Goodwin 2007a), making the Maidens the Northern Ireland stronghold for this species. There are six records from the Maidens (two pair from the same site so not clearly visible on map). It is an important component of the *Polyplumaria flabellata* and *Diphasia alata* hydroid community.



Diphasia nigra



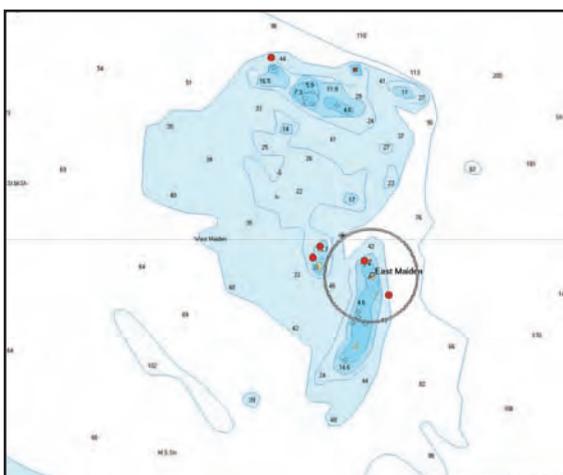
Diphasia nigra distribution

Halecium plumosum Hincks 1868 (NICP)

This species was recorded during the NISS from two sites, Lochgarry off Rathlin Island, Co Antrim and Russel Rock, Maidens. During SSNI *H. plumosum* was recorded from all coasts of Rathlin (Lochgarry, White Cliffs, Picton's Reef, Illancarragh Bay), from Russell's Rock on the Maidens, Carlingford Lough and from two sites in Strangford Lough. At several of these sites it was common. In view of these findings it cannot be classified as rare in Northern Ireland its removal from the NICP species list was recommended (Goodwin et al. 2011). In 2008 it was recorded from additional sites on the Maidens.



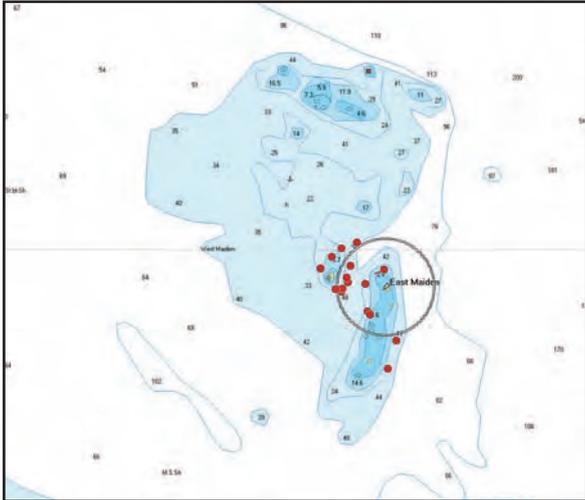
Halecium plumosum



Halecium plumosum distribution

***Lytocarpia myriophyllum* (Linnaeus, 1758)
(NICP)**

The hydroid is normally found in deep water, below 25m. It is widespread in the eastern North Atlantic and occurs on all coasts of the British Isles. Known in Northern Ireland from the east coast of Rathlin Island and the Maidens.



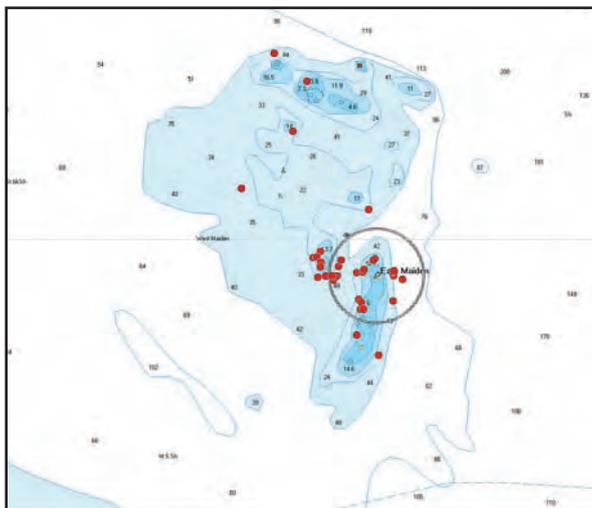
Lytocarpia myriophyllum distribution



Lytocarpia myriophyllum

***Polyplumaria flabellata* GO Sars, 1874 - lacy hydroid (NICP)**

There are few records of this distinctive species, in Britain it is mostly recorded from western coasts but records are sparse. In Northern Ireland it is present on the east coast of Rathlin and on the Maidens. The habitat on the east coast of Rathlin has been damaged (Picton and Goodwin 2007a), making the Maidens the Northern Ireland stronghold for this species. It is an important component of the *Polyplumaria flabellata* and *Diphasia alata* hydroid community



Polyplumaria flabellata distribution



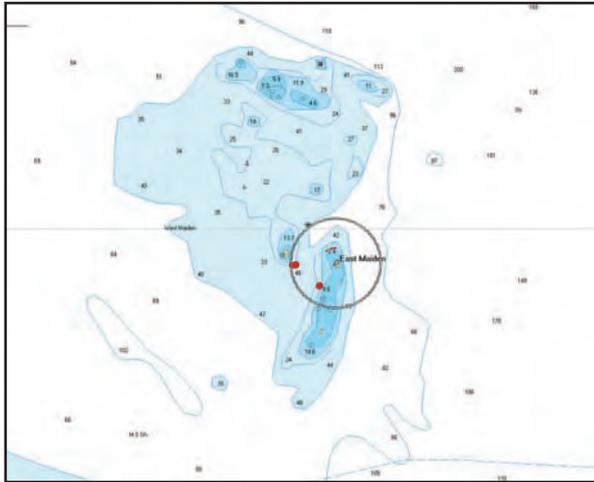
Polyplumaria flabellata

***Virgularia mirabilis* (O F Müller, 1776) – the slender sea pen (NICP)**

Small populations of this species occur on the Maidens in pockets of suitable habitat. However there are no large beds such as those present in Carlingford Lough as large areas of suitable substrate are lacking.



Virgularia mirabilis



Virgularia mirabilis distribution

***Mesacmaea mitchellii* (Gosse, 1853) –**

Policeman’s Helmet Anemone

This anemone was recorded from one site on the Maidens (060816/04, south of west maiden). This species is only known from one other site in Ireland, Kilkieran Bay in County Galway. It is locally frequent on the south and southwest coast of the British Isles and occurs north to mid Scotland (Manuel, 1988). There are recent records from Lundy, Skomer Island and the Llyn Peninsula (Wales), and North Devon (Goodwin et al. 2011)).

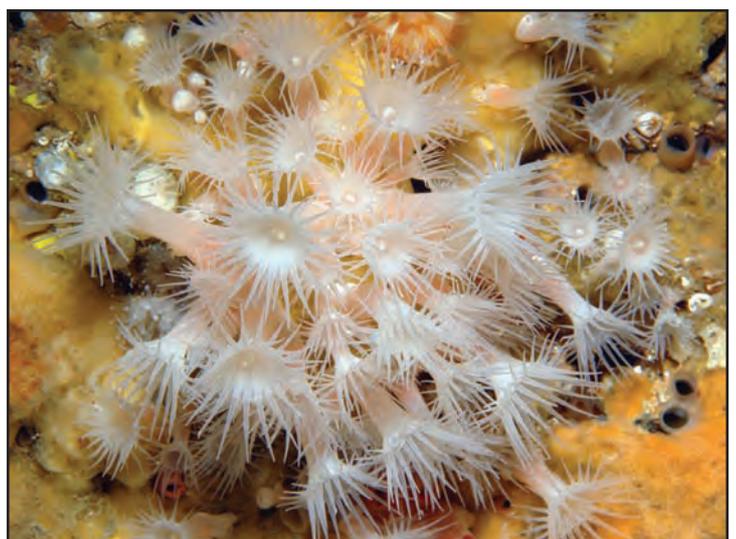


Mesacmaea mitchellii

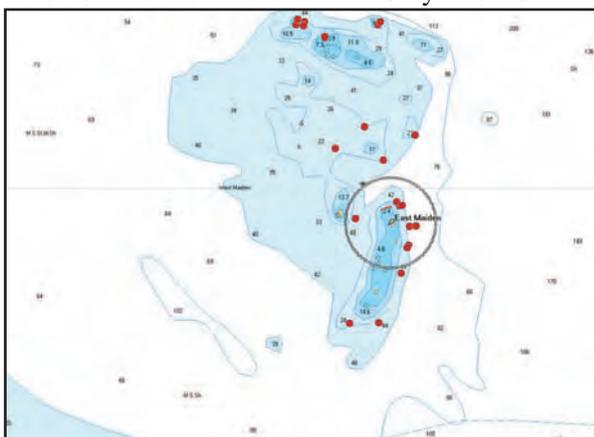
***Parazoanthus anguicomis* (Norman, 1868)**

(SOCC) The white trumpet anemone

Parazoanthus anguicomis is found at scattered locations around Scotland and in deep water around northern Europe, south to Lundy Island and Brittany. Most previous Northern Ireland records were from Rathlin with only two from



Parazoanthus anguicomis



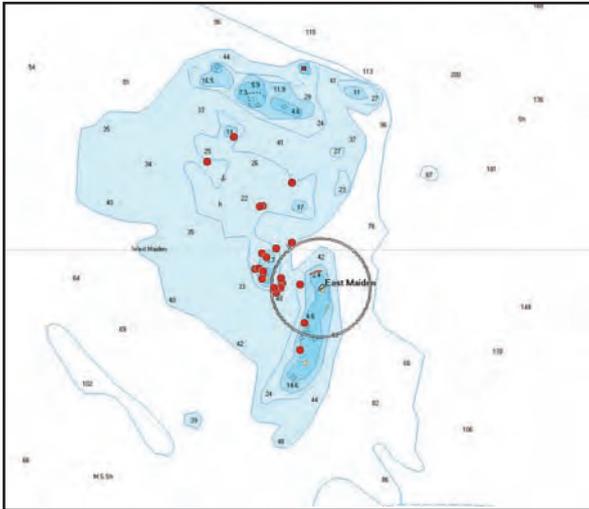
Parazoanthus anguicomis distribution

the Maidens (NISS). The species was recorded at many sites on the Maidens during SSNI and the 2008 surveys and is an important component of Habitat 2 (*Tubularia indivisa* and *Alcyonium digitatum*)

Crustacea

Homarus gammarus (Linnaeus, 1758) - Common Lobster (SOCC)

Recorded from several sites. Pot fishing occurs on the Maidens and the fishery is subject to sustainable management practice such as v-notching.



Above: *Homarus gammarus*,
Left: *Homarus gammarus* distribution

Munida rugosa (Fabricius, 1775) - long clawed squat lobster (NICP)

This species is widespread and fairly common in Northern Ireland but is threatened by opportunistic fishing and has undergone recent rapid decline. The main populations appear to be on Rathlin Island and in Strangford Lough (Goodwin et al. 2011).



Munida rugosa

Munida rugosa distribution

Mollusca

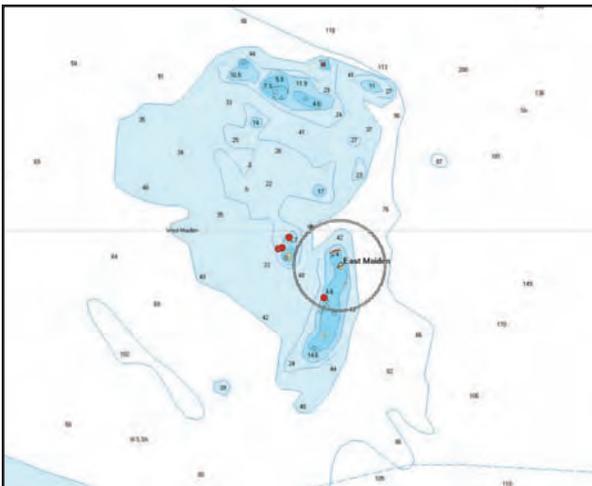
Caloria elegans (Alder & Hancock, 1845) – Nudibranch

One record from the Maidens in 2006 and three further in 2008. The 2006 record was the first record for Northern Ireland and the second location for Ireland, there are only five previous records for the British Isles.

It was originally described from Torbay and has also been found at Lundy, Lough Swilly in Donegal, and off the Lleyen peninsula in Wales in 1984, (Moore, 2002, Picton 1979, Picton & Morrow, 1994). There is a more recent record from Cardigan Bay in 1995 by Dr Bill Sanderson in CCW (MarLIN). There is one record from near Whitby on the NE English coast (MNCR), it has not been possible to check this but the record seems unlikely, given the southern distribution of the species. *Caloria elegans* is common in the Mediterranean, where it was formerly known as *Caloria maculata* (Picton & Morrow, 1994).



Caloria elegans



Caloria elegans distribution

Jorunna sp. nov. A. - nudibranch

Spotty *Jorunna*

Records were made of this species, presumed to be a new species, from NE Maiden and Russel's Rock in the Maidens. It was also recorded from Damicornis Bay, Duncan's Bay, Picton Reef on Rathlin; and North of the Storks on the Skerries during the SSNI project (Goodwin et al. 2011). It appears to feed on the sponge *Haliclona urceolus*. It is in the process of being described.



Jorunna sp. nov.

***Pecten maximus* (Linnaeus, 1758) (SOCC) – King Scallop**

This species is common, particularly on the east and southeast coasts of Northern Ireland. Wild stocks of the king scallop are thought to be declining, mainly due to overfishing, and damage to the benthic communities which act as nursery grounds (Nunn 2007). Many records during SSNI, widespread over all areas surveyed. Not abundant on the main Maidens group because of lack of suitable habitat, likely to be more common on deeper sand and gravel offshore of the rocks (not surveyed).



Pecten maximus



Pecten maximus distribution

***Okenia elegans* (Leuckart, 1828)**

Yellow skirt sea slug

One record from NW of West Maiden (070813/02). This distinctive sea slug is rare in the British Isles. It has been recorded in the British Isles from scattered localities in SW England, Skomer Island and neighbouring Pembrokeshire, Bardsey Island in North Wales, the Saltees in County Wexford, St Kilda, Strangford Lough and the Skerries in Portrush (Ellis 1995, Goodwin 2008, Moore 2002, Picton & Morrow 1994, Rudman 2007). It feeds on the ascidian *Polycarpa rustica* and may sometimes be seen with just its gills emerging from the test of the ascidian. It is known more widely from the Mediterranean and the Bay of Biscay. It has recently been recorded in Northern Ireland from Rathlin Island and the Skerries.

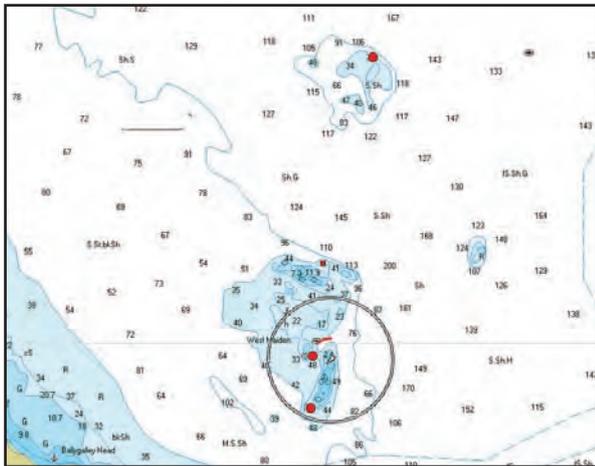


Okenia elegans

Bryozoa

Bugula turbinata Alder, 1857 (SOCC)

Three records, all from NISS. Recently recorded in Northern Ireland from Limestone and Hadd rock in Strangford Lough (Goodwin et al. 2011). With other NISS records from the Skerries and Strangford Lough. This is a southern species, reaching up to the Clyde on the west coast of Britain (Hayward & Ryland 1998).



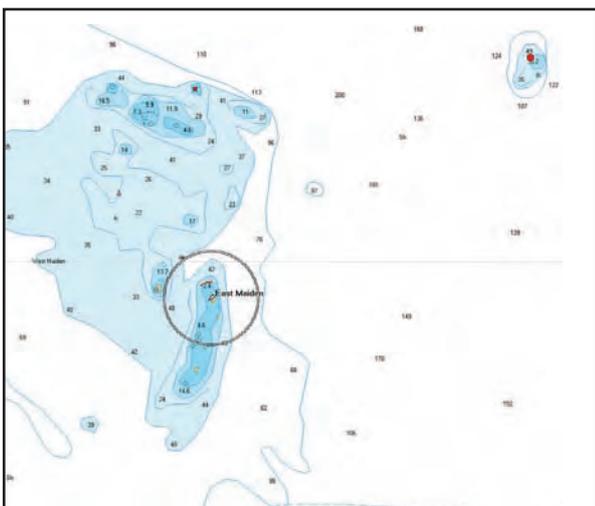
Bugula turbinata distribution



Bugula turbinata

Pentapora fascialis var. *foliacea* (Pallas 1766) - Ross Coral or Potato Crisp Bryozoan (NICP)

Most other Northern Ireland Records are from the north coast of Northern Ireland (Rathlin Island, the Skerries and offshore of the Giant's Causeway (Goodwin et al. 2011). One record was made during NISS from Pinnacle east of the Maidens (dive 850801) but no recent records have been made from this area.



Pentapora distribution



Pentapora

Algae

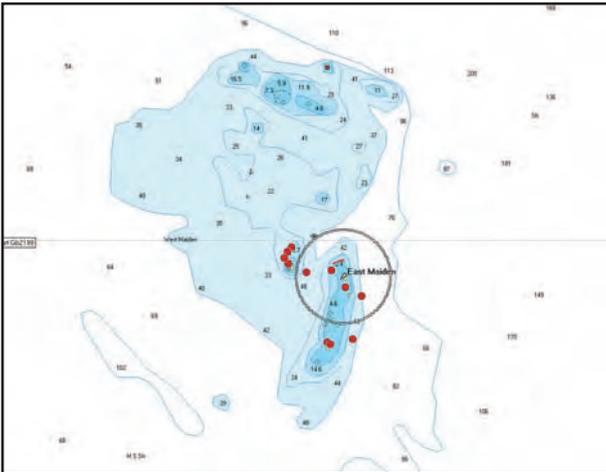
Chromophycota - Brown Algae

Carpomitra costata (Stackhouse) Batters (NICP)

Rare sublittoral algal species. Known from the north and east coasts of Antrim in Northern Ireland (Morton 1994, Morton 2007a). A southern species found mainly in the SW of the UK but with scattered records as far north as St Kilda (Skewes 2008).



Carpomitra costata



Carpomitra costata distribution

Desmarestia dresnayi J.V. Lamouroux ex Leman 1819 (NICP)

Prior to NISS there was only one Northern Ireland record of this species, from Altacarry Head on Rathlin Island (Morton 1994; Morton 2007b). During surveys 2006-2008 three records were made from the Maidens, all from the same area near to the sheafing rock, associated with the maerl habitat (Habitat 7). Rare species with a western distribution, other records from the west coast of Ireland and Scotland and Atlantic coasts of France and Spain (Morton 2007b).



Desmarestia dresnayi



Desmarestia dresnayi distribution

Rhodophycota - Red Algae

Schmitzia hiscockiana Maggs et Guiry (SOCC)

Previously known from Rathlin Island, Murlough Bay, Torr Head, Loughan Bay and Ringfad Point county Antrim, and Rue Point County Down. Originally described from Northern Ireland in 1985 (Morton 2007c).



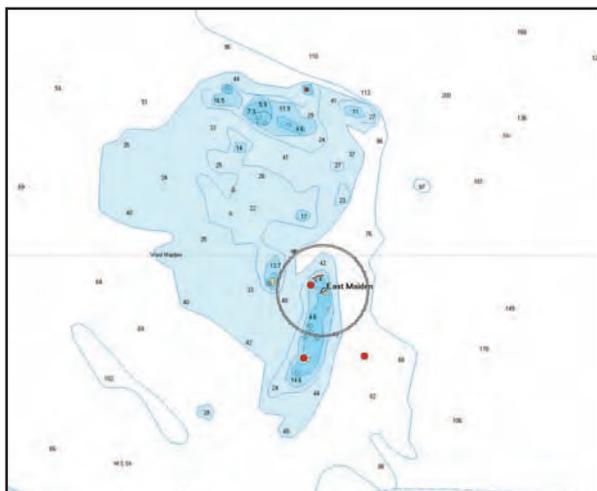
Schmitzia hiscockiana distribution



Schmitzia hiscockiana

Stenogramme interrupta (C Agardh) Montagne ex Harvey (SOCC)

Sublittoral species which may be frequent in Northern Ireland, Northern Ireland is the Irish stronghold for this species (Morton 2007d).



Stenogramme interrupta distribution



Stenogramme interrupta

Assessment of Conservation Importance of the Maidens

Importance in Northern Ireland Context

Many of the species recorded from the Maidens occur only here and on Rathlin Island within Northern Ireland. The presence of these rare species is probably largely because of the topography: the Maidens plateau rises from deep water creating tidal conditions not found elsewhere in Northern Ireland. The many islets and pinnacles result in the presence of a wide range of hydrographic conditions ranging from areas exposed to the full force of the Irish Sea tidal stream such as the Highlandman rock at the north end of the group, to more sheltered areas, protected from the main tidal flow by the larger islets such as east and west Maiden.

The hydroid communities are particularly notable. the proximity of comparatively deep water results in the presence of a suite of deeper water species in much shallower water than they would normally be found. These include several Northern Ireland Conservation Priority hydroid species: *Diphasia alata*, *Diphasia nigra*, *Polyplumaria flabellata*, *Lytocarpia myriophyllum* and *Halecium plumosum*. These hydroid community is very scarce in Britain and Ireland, the only record outside Northern Ireland is from the Firth of Lorn in Scotland. In some areas of the Maidens these hydroids are particularly numerous, forming dense hydroid forests (Habitat 5). These species have only been recorded from Rathlin Island and the Maidens in Northern Ireland and the Maidens populations are particularly important in view of the damage to the Rathlin hydroid/boulder communities on the east coast (Picton and Goodwin 2007). Unlike the Rathlin communities the Maidens populations are on bedrock or immediately adjacent to steep bedrock so are unlikely to suffer damage from mobile fishing gear. No damage was observed during the course of this survey. A particularly good example of this hydroid community are found at Site 25.

The sponge fauna of the Maidens is also extremely rich. Areas of a deep water sponge community biotope (Habitat 4) are present. This is similar to the sponge communities found on Rathlin Island, and is present in only these two areas of Northern Ireland. The majority of the Northern Ireland records for *Microciona elliptichela* and *Clathria barleei*, Northern Ireland priority species are from the Maidens. Several of the sponges first described from Rathlin Island during the 2005 'Sponge Biodiversity of Rathlin Island' project (Picton & Goodwin 2007a,b, Goodwin & Picton 2009) are present on the Maidens, these include: *Axinella parva*, *Lissodendoryx (Ectyodoryx) jenjonsae*, *Hymedesmia cohesibacilla*, *Hymedesmia rathlinia*, *Hymedesmia stellifera*, *Hymeraphia breeni*, and *Tethya hibernica*. Species recorded as new to Northern Ireland during the Sponge Biodiversity of Rathlin Island project, *Antho brattgardii*, *Hymedesmia primitiva*, *Plocamionida tylotata* and *Axinella pyramidata*, are also found here. The diversity of species and the presence of these rare species make the sponge communities on the Maidens some of the most important in the British Isles.

The maerl bed near the Sheafing Rock to the south of the Maidens (Site 68) represents a good example of this habitat. Several rare algal species are associated with this and the surrounding gravel areas (Sites 69-72) including the Northern Ireland Priority Species *Desmarestia dresnayi*, *Carpomitra costata*, *Schmitzia hiscockiana*, and *Stenogramme interrupta*.

The Maidens do not have a particularly diverse flora. All sites surveyed were exposed to waves and current and much of the rock down to 20 m or below was sand covered with *Rhodothamniella floridula* dominating to the exclusion of other species. Only in the top few meters was the rock free from sand and here intense wave action prevents all but very hardy species surviving.

Nationally protected habitats and species present on the Maidens

UK Biodiversity Action Plan priority habitats: Fragile Sponge & Anthozoan communities on subtidal rocky habitats, Maerl Beds, Subtidal sand and gravels, Tide-swept channels.

European Species and Habitats Directive Annex 1 Habitats: 1170 Reefs, 1110 Sandbanks which are slightly covered by sea water all the time.

European Species and Habitats Directive Annex II Species: 1349 Bottlenose Dolphin *Tursiops truncatus*, 1351 Harbour porpoise *Phocoena phocoena*, 1364 Grey seal *Halichoerus grypus*, 1365 Common/Harbour seal *Phoca vitulina*

Recommendations for future work

Multibeam Survey

Recently the Joint Irish Bathymetric Survey (JIBS) project has used multibeam sonar to map a large area of the northern coast of Northern Ireland. Currently only Malin Head from Rathlin Island has been targeted, However, the outputs of this project show the great potential of this sort of mapping for identification of features of conservation interest, particularly in topographically complex areas such as the Maidens. It is recommended that any multibeam surveys of the Maidens be made readily available.

Additional survey of submerged pinnacles

Some of the submerged pinnacles surrounding the main Maidens groups were identified from chart and echosounder positioning and have been surveyed. However, there are many such features surrounding the Maidens which remain unsurveyed and these merit future survey work. Following multibeam survey it should be possible to accurately locate these features and target survey work at sites of interest. These isolated pinnacles and ridges are of high conservation importance, with the presence of Northern Ireland Conservation Priority species and other species of conservation interest likely.

Continued monitoring/taxonomic work on sponge and hydroid communities

It is apparent that the Maidens are of great importance for several rare sponge and hydroid species. Many of these are restricted to the Maidens and Rathlin Island within Northern Ireland, and also have an extremely limited distribution in the rest of Britain and Ireland. Consequently the populations present on the Maidens are of high conservation importance and continued monitoring of their status should be undertaken. It is likely that this would require dive surveys at regular intervals and possibly fixed photographic quadrat monitoring stations.

Education

The Maidens are a popular destination for scuba diving within Northern Ireland with both local clubs and commercial operators running dive trips. Currently much of the diving targets the numerous wreck sites around the group. A guide to the marine life and scenic dive sites of this area would be useful in promoting the conservation value of the Maidens both within this user group and to the wider general public.

Acknowledgements

This project is a partnership between Northern Ireland Environment Agency and National Museums Northern Ireland. We are grateful to the support of these organisations for this work. The project was funded by the NIEA Natural Heritage Directorate research and development series through a CEDaR (Centre for Environmental Data and Recording) initiative. This CEDaR initiative brings together resources and the expertise of scientists from the National Museums Northern Ireland's Department of Natural Sciences and the NIEA conservation science team. We are greatly indebted to the programme for the support of this and other similar initiatives. We would like to specially thank Damian McFerran and Julia Nunn (CEDaR) and Mark Wright (NIEA) for their assistance with this project. Thanks to Peter and Caroline Steele of North Irish Lodge for providing local information, Judith Tweed and family of St. Ronans for accommodation and logistical support, and Stephanie Bennett and Joanne Hanna of Northern Ireland Environment Agency for boat handling and assistance organising the surveys. Thanks also to SSNI survey team members: Lin Baldock, Francis Bunker, Jennifer Jones, David Goodwin, Trevor Harrison, Anne Marie Mahon, Jon Moore, and Paulo Pizzolla. Finally thanks to Stephanie Bennet (NIEA) for editorial assistance. The cover photograph was taken by Francis Bunker.

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♀ Appendix 1 – Table of dives from 2006-2008 SSNI survey of the Maidens.

Two dives from NISS are included for a location there were no SSNI dives from (Pinnacle East of the Maidens). The dive number is a unique identifier for the dive composed of the date backwards and the chronological position in the dive sequence on that day. e.g 060807/01 would be the first dive on 7th August 2006. All photos and specimens are labelled using this number. Positions are given in the Marine Recorder output format. 54 57.291, -5 45.008 is equal to 54° 57.291' N and 005° 45.008' W. Where several dives took place in the same location these have been combined in the report to one site record (section ?), the site number is given in column 3. Sites have been divided into ? key habitats, the habitats present at each site are given in column 6. The Marine Recorder site name and number are given for reference.

Dive number	Position	Site	Site name in Report	Surveyors	Habitat type	Marine Recorder number	Site name on Marine Recorder
070824/01	54 57.291, -5 45.008	1	North of Russell's Rock	Claire Goodwin David Goodwin	1 - Tubularia and Corynactis	MRUMU1000000001B7	Russell's Rock
070824/02	54 57.298, -5 44.986	2	North of Russell's Rock	Bernard Picton Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU1000000001B8	Russell's Rock
060817/01	54 57.257, -5 45.004	3	South of Russell's Rock	Bernard Picton Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU10000000013F	Russell's Rock
060817/03	54 57.253, -5 44.997	3	South of Russell's Rock	Joe Breen Trevor Harrison Paulo Pizzolla	2 - Tubularia and Aleyonium	MRUMU100000000141	Russell's Rock
060817/02	54 57.237, -5 45.016	4	South of Russell's Rock	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU100000000140	Russell's Rock
060816/03	54 57.248, -5 44.908	5	South-East Russell's Rock	Trevor Harrison Paulo Pizzolla	2 - Tubularia and Aleyonium	MRUMU10000000013B	Russell's Rock
060818/01	54 57.156, -5 44.628	6	North-West Allen's Rock	Bernard Picton Jennifer Jones	5 - Hydroid	MRUMU100000000145	NW Allen's Rock
180806/02	54 57.166, -5 44.624	7	North-West Allen's Rock	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU100000000146	NW Allen's Rock
080813/03	54 57.103, -5 44.518	8	North of Allen's Rock	Francis Bunker Hugh Edwards	6 - Kelp	MRUMU10000000020A	N of Allen's Rock
060815/03	54 56.790, -5 43.898	9	SE of Allen's Rock	Bernard Picton Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU100000000134	SE Allens Rock
080617/02	54 57.172, -5 44.353	10	Mound NE of Allen Rock	Jon Moore Claire Goodwin	3 - Aleyonium, sponges, bryozoans	MRUMU1000000001EF	N of Allen Rock
060815/01	54 57.237, -5 43.843	11	East of the Highlandman	Claire Goodwin David Goodwin	3 - Aleyonium, sponges, bryozoans	MRUMU100000000132	E of the Highlandman
060818/03	54 57.258, -5 43.922	11	East of the Highlandman	Trevor Harrison Paulo Pizzolla	3 - Aleyonium, sponges, bryozoans	MRUMU100000000147	E of the Highlandman
080814/04	54 57.279, -5 43.892	12	North of the Highlandman	Jennifer Jones Hugh Edwards	1 - Tubularia and Corynactis	MRUMU100000000210	Highlandman

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060815/02	54 57.185, -5 43.820	13	Pinnacle SE of the Highlandman	Trevor Harrison Paulo Pizzolla	3 - Alcyonium, sponges, bryozoans	MRUMU100000000133	SE of the Highlandman
070824/04	54 57.044, -5 43.232	13	Pinnacle SE of the Highlandman	Bernard Picton Jennifer Jones	3 - Alcyonium, sponges, bryozoans	MRUMU1000000001BA	Pinnacle SE Highlandman
080617/01	54 56.791, -5 44.806	14	Pinnacle SW of Maiden Rock	Bernard Picton Lin Baldock	8 - Tide-swept cobbles, 4 - Sponge community	MRUMU1000000001EE	Pinnacle SW of Maidens Rock
080813/01	54 56.620, -5 45.126	15	NW of West Maiden	Claire Goodwin Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU100000000209	NW of West Maiden
070824/03	54 56.372, -5 45.457	16	Pin Head Pinnacle	Claire Goodwin David Goodwin	4 - Sponge community	MRUMU1000000001B9	Pin Head Pinnacle
060808/01	54 56.410, -5 43.431	17	NNE East Maiden	Bernard Picton Anne Marie Mahon	1 - Tubularia and Corynactis	MRUMU100000000128	NNE East Maiden
060808/02	54 56.410, -5 43.431	17	NNE East Maiden	Claire Goodwin David Goodwin	1 - Tubularia and Corynactis	MRUMU100000000129	NNE East Maiden
080722/04	54 56.306, -5 44.487	18	Reef N of West Maiden	Bernard Picton Hugh Edwards	2 - Tubularia and Aleyonium	MRUMU100000000200	reef N of West Maiden
080722/03	54 56.307, -5 44.458	18	Reef N of West Maiden	Joe Breen Claire Goodwin	2 - Tubularia and Aleyonium	MRUMU100000000231	N of West Maiden
080620/03	54 56.217, -5 43.850	19	Pinnacle between Maidens and Allen's Rock	Jon Moore Claire Goodwin	2 - Tubularia and Aleyonium	MRUMU1000000001FB	Pinnacle, Maidens
060816/01	55 00.532, -5 42.585	20	Annika's Pinnacle	Bernard Picton Jennifer Jones	1 - Tubularia and Corynactis	MRUMU100000000139	Annika's Pinnacle, Maidens
060816/02	55 00.532, -5 42.585	20	Annika's Pinnacle	Claire Goodwin David Goodwin	4 - Sponge community	MRUMU10000000013A	Annika's Pinnacle, Maidens
850801/02	54 57.50, -5 39.50	21	Pinnacle East of the Maidens	Bernard Picton, Christine Howson	1 - Tubularia and Corynactis	JNCCMNCR50012104	Pinnacle East of the Maidens
850801/01	54 57.50, -5 39.50	21	Pinnacle East of the Maidens	David Connor, Francis Hood	1 - Tubularia and Corynactis	JNCCMNCR50011963	Pinnacle East of the Maidens
070813/01	54 55.978, -5 44.460	22	North of West Maiden	Claire Goodwin David Goodwin	3 - Alcyonium, sponges, bryozoans	MRUMU1000000001AD	NE of West Maiden
080617/03	54 55.952, -5 44.410	23	North of West Maiden	Bernard Picton Lin Baldock Claire Goodwin	4 - Sponge community, 8 - Tide-swept cobbles, 9- gravel	MRUMU1000000001F8	NW of West Maiden

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080811/01	54 55.917, -5 44.461	24	NW of West Maiden	Francis Bunker Jennifer Jones	6 - Kelp, 5 - Hydroid	MRUMU100000000206	NW West Maiden
080811/01	54 55.917, -5 44.461	24	NW of West Maiden	Francis Bunker Jennifer Jones	6 - Kelp, 5 - Hydroid	MRUMU100000000206	NW West Maiden
080811/02	54 55.914, -5 44.459	24	NW of West Maiden	Claire Goodwin Hugh Edwards	6 - Kelp, 5 - Hydroid	MRUMU100000000207	NW West Maiden
080811/02	54 55.914, -5 44.459	24	NW of West Maiden	Claire Goodwin Hugh Edwards	6 - Kelp, 5 - Hydroid	MRUMU100000000207	NW West Maiden
060818/04	54 55.866, -5 44.551	25	Hydroid Garden, NW West Maiden	Bernard Picton Jennifer Jones	5 - Hydroid	MRUMU100000000148	NW of West Maiden
080618/03	54 55.872, -5 44.502	25	Hydroid Garden, NW West Maiden	Jon Moore Claire Goodwin	5 - Hydroid	MRUMU1000000001F1	NW of West Maiden
080815/03	54 55.869, -5 44.528	25	Hydroid Garden, NW West Maiden	Claire Goodwin Jennifer Jones	5 - Hydroid	MRUMU100000000212	E of the Maidens
070813/02	54 55.869, -5 44.546	25	Hydroid Garden, NW West Maiden	Bernard Picton Jennifer Jones	5 - Hydroid	MRUMU1000000001AE	NW of West Maiden
080815/04	54 55.852, -5 44.451	26	West of West Maiden	Francis Bunker David Goodwin	6 - Kelp	MRUMU100000000213	W of West Maiden
080618/04	54 55.832, -5 44.452	27	West of West Maiden	Lin Baldock Hugh Edwards	5 - Hydroid	MRUMU1000000001F2	S of West Maiden
080812/03	54 55.810, -5 44.419	28	West of West Maiden	Francis Bunker Jennifer Jones	6 - Kelp	MRUMU100000000208	W of West Maiden
070814/04	54 55.800, -5 44.460	29	West of West Maiden	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU1000000001B1	W side of West Maiden
060818/05	54 55.775, -5 44.436	30	South -west of west maiden	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU100000000149	W of West Maiden
080724/04	54 55.732, -5 44.395	31	South of West Maiden	Bernard Picton Hugh Edwards	2 - Tubularia and Aleyonium	MRUMU100000000205	S of West Maiden
060816/04	54 55.720, -5 44.364	32	South of West Maiden	Claire Goodwin David Goodwin	3 - Aleyonium, sponges, bryozoans	MRUMU10000000013D	S of West Maiden
060816/04	54 55.721, -5 44.322	33	South of West MAiden	Bernard Picton Jennifer Jones	3 - Aleyonium, sponges, bryozoans, 9 -shell gravel	MRUMU10000000013C	S of West Maiden
080724/03	54 55.720, -5 44.273'	34	South-east of West Maiden	Joe Breen Claire Goodwin	5 - Hydroid	MRUMU100000000204	SE of West Maiden

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070814/01	54 55.725, -5 44.283	35	South-east of West Maiden	Claire Goodwin David Goodwin Hugh Edwards Jennifer Jones	5 - Hydroid	MRUMU1000000001B2	SE West Maiden
060817/04	54 55.727, -5 44.261	36	South-east of West Maiden	Bernard Picton Jennifer Jones	5 - Hydroid	MRUMU100000000142	SE of West Maiden
060817/05	54 55.735, -5 44.241	36	South-east of West Maiden	Claire Goodwin David Goodwin	5 - Hydroid	MRUMU100000000143	SE of West Maiden
080620/02	54 55.735, -5 44.263	37	South-east of West Maiden	Lin Baldock Hugh Edwards	5 - Hydroid	MRUMU1000000001FA	SE West Maiden
080821/01	54 55.753, -5 44.273	38	South-east of West Maiden	Francis Bunker Jennifer Jones	6 - Kelp	MRUMU10000000021B	SE of West Maiden
060814/01	54 55.768, -5 44.218	39	South-east of West Maiden	Bernard Picton Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU10000000012D	E of West Maiden
060814/02	54 55.768, -5 44.218	39	South-east of West Maiden	Trevor Harrison Paulo Pizzolla	2 - Tubularia and Aleyonium	MRUMU10000000012E	E of West Maiden
080723/02	54 55.803, -5 44.231	40	East of West Maiden	Joe Breen Claire Goodwin	5 - Hydroid	MRUMU100000000201	E of West Maiden
080822/02	54 55.731, -5 44.254	41	South-east of West Maiden	Jennifer Jones Hugh Edwards	2 - Tubularia and Aleyonium	MRUMU10000000021F	W of West Maiden
080819/01	54 55.849, -5 44.197	42	East of West Maiden	Francis Bunker Jennifer Jones	5 - Hydroid	MRUMU100000000215	East of West Maiden
080821/02	54 55.868, -5 44.248	43	North of West Maiden	Jennifer Jones Hugh Edwards	6 - Kelp	MRUMU10000000021C	N of West Maiden
080814/01	54 55.886, -5 44.181	44	NE of West Maiden	Claire Goodwin Jennifer Jones Hugh Edwards	4 - Sponge	MRUMU10000000020D	NE of West Maiden
080818/02	54 55.886, -5 44.181	44	NE of West Maiden	Bernard Picton Francis Bunker	4 - Sponge	MRUMU100000000214	E of West Maiden
070814/03	54 55.759, -5 44.001	45	Between West and East Maiden	Bernard Picton Hugh Edwards Jennifer Jones	5 - Hydroid	MRUMU1000000001B0	between West and East Maiden
080820/02	54 55.763, -5 43.919	46	NW of East Maiden	Bernard Picton Hugh Edwards	5 - Hydroid	MRUMU10000000021A	NW of East Maiden
080814/03	54 55.782, -5 43.906	47	West of East Maiden	Francis Bunker Claire Goodwin	8 - Tide-swept cobbles, 5 - Hydroid	MRUMU10000000020F	West Maiden

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080620/04	54 55.849, -5 43.839	48	East Maiden	Lin Baldock Hugh Edwards	5 - Hydroid	MRUMU1000000001FC	East Maiden
060814/05	54 55.850, -5 43.787	49	NNW East Maiden	Bernard Picton Jennifer Jones	5 - Hydroid	MRUMU1000000000131	NNW East Maiden
060814/02	54 55.864, -5 43.635	50	North of East Maiden	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU100000000012F	N of East Maiden
060814/03	54 55.853, -5 43.658	50	North of East Maiden	Trevor Harrison Paulo Pizzolla	2 - Tubularia and Aleyonium	MRUMU1000000000130	N of East Maiden
060815/06	54 55.897, -5 43.677	50	North of East Maiden	Bernard Picton Jennifer Jones	2 - Tubularia and Aleyonium	MRUMU1000000000138	N of East Maiden
060807/03	54 55.871, -5 43.605	51	North of East Maiden	Bernard Picton Anne Marie Mahon	2 - Tubularia and Aleyonium	MRUMU1000000000223	N of East Maiden
070817/04	54 55.858, -5 43.769	52	North of East Maiden	Hugh Edwards Jennifer Jones	5 - Hydroid	MRUMU10000000001B4	N of East Maiden
080821/03	54 55.770, -5 43.661	53	North-East of East Maiden	Francis Bunker Hugh Edwards	6 - Kelp	MRUMU100000000021D	NE of East Maiden
080822/01	54 55.771, -5 43.530	54	East of East Maiden	Francis Bunker Jennifer Jones	4 - Sponge	MRUMU100000000021E	E of East Maiden
060815/04	54 55.766, -5 43.552	55	North-East of East Maiden	Claire Goodwin David Goodwin	5 - Hydroid	MRUMU1000000000136	NE East Maiden
080820/01	54 55.769, -5 43.524	56	North-East of East Maiden	Francis Bunker Jennifer Jones	5 - Hydroid	MRUMU1000000000219	NE of East Maiden
060807/04	54 55.734, -5 43.536	57	East of East Maiden	Claire Goodwin David Goodwin	5 - Hydroid	MRUMU1000000000127	E East Maiden
070817/03	54 55.705, -5 43.501	58	East of East MAiden	Claire Goodwin David Goodwin	2 - Tubularia and Aleyonium	MRUMU10000000001B3	E of East Maiden
060815/05	54 55.642, -5 43.544	59	SE of East Maiden	Trevor Harrison Paulo Pizzolla	2 - Tubularia and Aleyonium	MRUMU1000000000137	SE East Maiden
080814/02	54 55.655, -5 43.729	60	South of East Maiden	Francis Bunker Claire Goodwin	7 - Maerl	MRUMU100000000020E	W of East Maiden
080620/01	54 55.594, -5 43.525	61	East of the Saddle	Jon Moore Claire Goodwin	6 - Kelp, 3 - Aleyonium, sponges, hydroids, 5 - Hydroid	MRUMU10000000001F9	E of Saddle
080724/02	54 55.569, -5 43.515	62	East of the Saddle	Bernard Picton Hugh Edwards	2 - Tubularia and Aleyonium	MRUMU1000000000203	E of the Saddle

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070820/01	54 55.549, -5 43.537	63	SE of the Saddle	Claire Goodwin David Goodwin	2 - Tubularia and Alcyonium	MRUMUJ000000001B5	Se The Saddle
070813/04	54 55.540, -5 43.938	64	West of the Bushes	Bernard Picton Hugh Edwards Jennifer Jones	2 - Tubularia and Alcyonium	MRUMUJ000000001AF	W of the Bushes
080819/02	54 55.490, -5 43.914	65	West of the Saddle	Bernard Picton Hugh Edwards	5 - Hydroid	MRUMUJ00000000216	W of The Saddle
080721/02	54 55.491, -5 49.952	66	South-West of the Saddle	Bernard Picton Hugh Edwards	5 - Hydroid	MRUMUJ000000001FE	SW of The Saddle
080819/04	54 55.301, -5 44.002	67	West of the Sheafing Rock	Bernard Picton Hugh Edwards	5 - Hydroid	MRUMUJ00000000218	W of Sheafing Rock
060807/02	54 55.253, -5 43.961	68	North of the Sheafing Rock	Claire Goodwin David Goodwin	7 - Maerl	MRUMUJ00000000126	NE of the Sheafing Rock, Maerls NW of the Sheafing Rock
060816/06	54 55.253, -5 43.955	68	North of the Sheafing Rock	Joe Breen Trevor Harrison Paulo Pizzolla	7 - Maerl	MRUMUJ0000000013E	NE of the Sheafing Rock
060807/01	54 55.239, -5 43.918	69	NE of the Sheafing Rock	Bernard Picton Anne Marie Mahon	6 - Kelp, 7 -Maerl	MRUMUJ00000000222	NE The Sheafing Rock
080815/02	54 55.319, -5 43.943	70	NW of the Sheafing Rock	Francis Bunker David Goodwin	6 - Kelp	MRUMUJ00000000211	S of West Maiden
080819/03	54 55.223, -5 44.001	71	West of the Sheafing Rock	Francis Bunker Jennifer Jones	7-Maerl	MRUMUJ00000000217	The Bushes
080813/03	54 55.239, -5 43.198	72	West of the Sheafing Rock	Francis Bunker Hugh Edwards	7 - Maerl	MRUMUJ0000000020B	W of The Sheafing Rock
060817/06	54 55.276, -5 43.635	73	East of the Sheafing Rock	Trevor Harrison Paulo Pizzolla	2 - Tubularia and Alcyonium	MRUMUJ00000000144	E of the Sheafing Rock
070820/02	54 55.153, -5 43.722	74		Hugh Edwards Jennifer Jones	5 - Hydroid	MRUMUJ000000001B6	Se The Sheafing Rock
03/04/2121	54 54.973, -5 43.910	75	South of the Sheafing Rock	Claire Goodwin Jennifer Jones	2 - Tubularia and Alcyonium	MRUMUJ0000000020C	S of The Sheafing Rock
080721/01	54 54.968, -5 44.296	76	SW of the Sheafing Rock	Joe Breen Claire Goodwin	1 - Tubularia and Corynactis	MRUMUJ000000001FD	SW Sheafing Rock
080721/01	54 55.353, -5 43.617	77	East of the Bushes	Joe Breen Claire Goodwin	2 - Tubularia and Alcyonium	MRUMUJ00000000202	E of The Bushes



Our aim is to protect, conserve and promote the natural environment and built heritage for the benefit of present and future generations.

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