

The table to the right shows how many species were recorded in each group and some of the most widely distributed species.

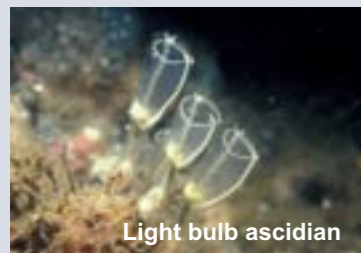


Anemones, Corals, Hydroids & Jellyfish

This was the most diverse group of animals recorded - 22 different species. Hydroids were common (10 species) especially the bushy *Halecium halecinum*. Amongst the rarer hydroids *Polyplumaria frutescens* occurred on the cobble and mixed sediment at the Mill Door.

The daisy anemone *Sagartia elegans* was abundant on many of the rock faces whilst the burrowing anemone *Cerianthus lloydii* was found in the sand. Amongst the less common anemones was the northern species *Bolocera tuediae* which is occasionally found on the east coast of Scotland but is rare on the west.

Dead men's fingers *Alcyonium digitatum* were common at most sites, particularly on vertical faces. One of the more unusual finds was the stalked jellyfish *Haliclystus auricula* which attaches itself to kelp fronds.



Light bulb ascidian

Sea squirts

Sea squirts were an important component of the fauna with Light bulb ascidians on the open rock throughout the area and the yellow ringed *Ciona intestinalis* in crevices and between boulders. Colonial ascidians were common in the surge conditions of the cave and gully walls.

Phylum	Common Name	Number of Species	Common Species	
Porifera	Sponges	5	Bread-crumble sponge	
	Cnidaria	Anemones, Corals, Hydroids, Jellyfish	22	Dead men's fingers Dahlia anemone Plumose anemone
		Ctenophora	Sea gooseberries	1
Nemertea	Ribbon worms	1		
Annelida	Segmented worms	8	Sand mason Keelworm Peacock worm	
Chelicerata	Sea spiders	1		
Crustacea	Barnacles, crabs,	25	Barnacle	
			Common lobster	
			Hermit crab	
			Squat lobster	
			Edible crab	
Mollusca	Shells, sea slugs, octopus	26	Velvet swimming crab	
			Grey top shell	
			Painted top shell	
Bryozoa	Sea mats	2		
	Echinodermata	Starfish, sea urchins	13	Purple sunstar
Common starfish				
Brittle star				
Tunicata	Sea squirts	11	Common sea urchin	
			Light-bulb ascidian	
Pisces	Fish	22	Ballan wrasse	
			Butterfish	
Algae	Seaweeds	24	Enc. coralline algae	
			Sea beech	
			Landlady's wig	
			Kelp or Cuvie	

Shells, Sea slugs and Octopus

Grey and Painted top shells were common in the kelp forests and both King and Queen scallops were present on the sediment sites. There were 8 species of sea slug recorded, often from the gully walls where they were feeding on bryozoans and hydroids. The Octopus *Eledone cirrhosa* was reported from 7 sites on the east coast, often hidden among boulders.

Starfish, Sea urchins and Sea cucumbers

The sea urchin *Echinus esculentus* is one of the most important animals around the island as its large numbers exert a heavy grazing pressure on the seabed. The bright red sunstar *Crossaster papposus* was conspicuous at many sites. Brittlestars *Ophiothrix fragilis* and *Ophiocoma nigra* were abundant as dense beds on the bedrock steps at both ends of the island.

Crabs and lobsters

Crustaceans were common throughout the area, often hiding in the boulder holes and crevices. Lobsters, edible and velvet crabs were found around the whole island. 4 species of squat lobster were recorded, with the bright red *Galathea strigosa* in crevices and *Munida strigosa* on the sediment. The masked crab *Corystes cassivelaunus* was found on sand at The Bishop.

Fishes

The most common fish were wrasse with Ballans found at most sites and Goldsinny common. Norwegian topknot were camouflaged on the open rock at several sites and Leopard spotted gobies were often seen hiding in crevices. Amongst the rarer fish were a Wolf fish off the east coast and, unusually for the North Sea, a Sunfish south of the Mill Door.



Wolf fish

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We would like to thank Cameron Small and Brian Anderson, the skippers of the Thistle B. Calum Duncan organised the surveys and this report was prepared by Christine Howson. Photographs are by C. Howson.

This Seasearch survey was organised as a part of the Marine Conservation Society's Members' Dives Programme with financial support from Scottish Natural Heritage

Seasearch is a volunteer underwater survey project for recreational divers to contribute to the conservation of the marine environment. Financial support for the project during 2003 and for the production of this summary report has been given by:



Rock wall



Male cuckoo wrasse

**Isle of May Survey
Summer 2001 & 2002
Summary Report**



Octopus



Nudibranch, *Flabellina pedata*



Sunstar



Life on gully wall

Isle of May

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

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



Grey seal



Guillemot

Kelp forests

Rock in shallow water all around the island was dominated by kelp forest, with the dominant species being *Laminaria hyperborea*. Kelp reached a maximum depth of 13 m on the exposed south-eastern tip of the island, but was only recorded to 3 m at Horse Hole on the west coast, one of the most sheltered sites dived. The kelp forests also extended deeper on the east coast than on the west, where, despite the availability of suitable rock and boulders, the large bushy alga *Desmarestia aculeata* replaced *Laminaria* below the main forest. Grazing by sea urchins was very pronounced around the whole island, reducing the diversity of species found within the kelp forests, and this is probably one of the major factors limiting the maximum depth of kelp. A second factor is almost certainly the differences in available light on the more exposed east (more light) and more sheltered west (less light) coasts.

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



Grazed kelp forest

Tide-swept rock

At a number of sites where there was more tidal movement, and particularly around the northern and southern ends of the island, dead men's fingers *Alcyonium digitatum* and the plumose anemone *Metridium senile* were more abundant. Where the tides are strongest there were dense beds of brittlestars *Ophiothrix fragilis* which covered the rock steps over much of the circalittoral. These were particularly abundant on the slightly deeper rock off Maiden Hair and the northern tip of the island. Associated species were relatively few, as the large numbers of brittlestars tend to smother other species, but were generally similar to those found in the rocky habitats.



Ophiothrix fragilis



Urticina eques

Sediment

A plain of mixed coarse sand and shell with cobbles and boulders was found beyond the rock around most of the island, with more clean shell gravel at the northern end. These mixed sediments appeared to support a fairly rich fauna and flora although they were not surveyed in any detail. In places there were significant scour-tolerant hydroid communities on the cobbles and boulders with species such as *Sertularia argentea* and *Abietinaria abietina* common. Other species present included sand gobies *Pomatoschistus* spp., dragonets *Callionymus lyra*, hermit crabs, the sand mason worm *Lanice conchilega*, the swimming crab *Liocarcinus depurator*, scallops *Pecten maximus* and *Aequipecten opercularis*, burrowing bivalves *Mya* sp. and *Ensis* sp., burrowing anemones *Cerianthus lloydii* and the brittlestars *Ophiura ophiura* and *Ophiura albida*.



Caves and gullies

Steep-sided rock gullies and caves were common in shallow water, and sea urchins have much less impact on these walls than on the more level rock. These gully walls supported a much richer, more colourful faunal turf than elsewhere, with large numbers of surge-tolerant species including the anemones *Sagartia elegans*, *Metridium senile*, dead men's fingers, sponges such as *Halichondria panicea*, *Clathrina*

coriacea, *Leuconia nivea* and *Esperiopsis fucorum* and ascidians including *Lissoclinum perforatum*, *Botryllus schlosseri* and *Clavelina lepadiformis*. Nudibranchs were common amongst this rich turf with several species recorded including the brightly coloured *Flabellina pedata* and *Polycera* spp. Mobile, clean cobbles were a feature of these sites with few species recorded as associated with them, although brittlestars and *Urticina felina* were present in places.

Deeper, animal-dominated rock

Circalittoral rock extended to at least 28m on the south-east of the island, 25m on the southern tip at Maiden Hair and 22m on the northern tip. Along the east coast, a mixed sediment plain began at between 9 and 17m. At most sites there was a mixture of stepped bedrock and boulder slopes with the fauna on the boulders and bedrock broadly similar. Heavy grazing by sea urchins restricted the diversity of community types.

Rock and boulders dominated by algal and



Dead men's fingers

bryozoan crusts and keel worms, with abundant sea urchins and sparse dead men's fingers were found all around the island, often extending from the bottom of the kelp zone to the rock-sediment interface. There were few species on the open rock with the red sunstar *Crossaster papposus* and the common starfish *Asterias rubens* found at many sites, anemones *Urticina felina* and *Metridium senile*, ascidians such as *Ciona intestinalis* and *Ascidia mentula* and scattered clumps of sea firs such as *Halecium halecinum*.

Crevices and boulder holes sheltered a greater variety of animals, including squat lobsters *Galathea* spp., edible crabs *Cancer pagurus*, lobsters *Homarus gammarus*, octopus *Eledone cirrhosa*, velvet swimming crabs *Necora puber*, sea cucumbers *Pawsonia saxicola* and shrimps. Fish were common with Cuckoo and Ballan wrasse found, wolf fish, scorpion fish *Taurulus bubalis* and Bull rout *Myoxocephalus scorpioides*. At sites where the boulders extended out onto the sediment plain the fauna was more diverse, with a greater variety of sea firs including *Abietinaria abietina*, *Polyplumaria frutescens* and *Sertularia argentea* and the large dahlia anemone *Urticina eques*.

The Middens

Steep rock and very large boulders down to 16 m at The Middens are covered with dead men's fingers, keel worms *Pomatoceros* sp., and the anemones *Sagartia elegans* and *Metridium senile* with occasional sunstars *Crossaster papposus* and the Devonshire cup coral *Caryophyllia smithii*, an unusual find on the east coast of Britain. From 16 m there is a more gradual slope of smaller boulders with brittlestars *Ophiothrix fragilis* and *Ophiura albida* and occasionally the peacock worm *Sabella pavonina*, grading in to a plain of mixed gravel, cobbles and boulders with sand gobies and hydroids.

Maiden Hair

Off the islet of Maiden Hair, on the southern tip of the May Isle, steep bedrock steps reach a depth of 25 m. In shallow water, the rock is covered with kelp with some plants of the sugar kelp *Laminaria saccharina* and the furbelows *Saccorhiza polyschides* mixed amongst the *Laminaria hyperborea* plants. The inshore rock is dissected by colourful, steep-sided gullies with anemones, sponges and hydroids on their walls; seals are often seen swimming here. Beyond the kelp, projecting ridges and vertical faces are covered with dead men's fingers whilst the deeper rock steps are carpeted with brittlestars, *Ophiothrix fragilis*.



Sagartia elegans



Polycera faeroensis

Mill Door

At the Mill Door, caves, arches and gullies penetrate the cliff face with vertical walls covered with an encrusting, surge-tolerant fauna. A colourful turf of sponges such as *Clathrina coriacea*, seasquirts, bryozoans and anemones, particularly dwarf plumose anemones *Metridium senile* and *Sagartia elegans* cover the gully and cave walls. Outside the caves, the seabed consists of a slope of large, angular boulders dropping to bedrock steps and then mixed sediment. Kelp and *Desmarestia aculeata* cover the shallow rock with urchins and dead men's fingers dominating the deeper rock. The *Desmarestia* was covered with large numbers of small caprellid amphipods during the survey. Whilst the fauna on the open rock is fairly sparse, the boulder holes support conger eels, octopus and squat lobsters and fish including Ballan and Goldsinny wrasse are common.