

Marine Nature Conservation Review

Sector 2

Orkney

Area summaries

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1999

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7

Wide Firth and Shapinsay Sound

Location

Position (centre)	HY 45 16	59°02'N 02°57'W
County/district	Orkney Islands	
Conservation agency/area	Scottish Natural Heritage	North Areas (Northern Isles)

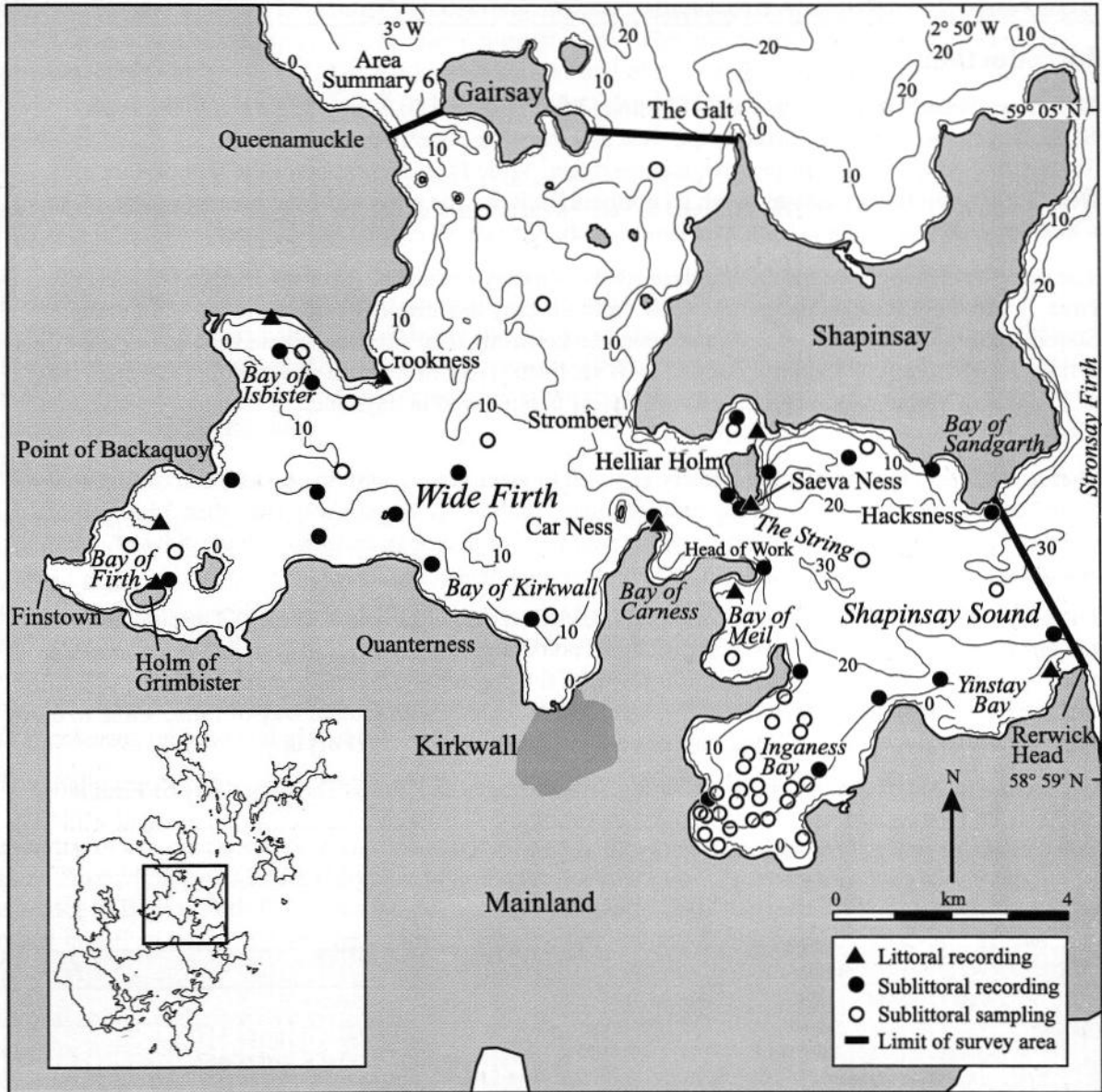


Figure 7.1 Main features of the area, showing sites surveyed.

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Physical features	
<i>Physiographic type</i>	Sounds with embayments
<i>Length of coast</i>	94 km
<i>Area of inlet</i>	92 km ²
<i>Bathymetry</i>	Maximum depth 31 m
<i>Wave exposure range</i>	Moderately exposed to the east near Rerwick Head, Shapinsay Sound, to sheltered in Bay of Firth
<i>Tidal stream range</i>	Weak in Wide Firth but increasing to moderately strong (approximately 3 knots) in Shapinsay Sound and accelerated to very strong through the String (approximately 6 knots)
<i>Tidal range</i>	2.4 m (mean springs), 1.1 m (mean neaps)
<i>Salinity range</i>	Fully marine

Introduction

Shapinsay Sound, on the north coast of Orkney Mainland, is bounded by Mainland to the south, Shapinsay to the north, the String to the west and Rerwick Head in the east. The String connects Shapinsay Sound to Wide Firth, a large embayment. Wide Firth encompasses the Bay of Kirkwall, Bay of Firth and Bay of Isbister, with its northern limit, for the purpose of the present report, taken as a line between Queenamuckle on Mainland and the Galt on Shapinsay, via Gairsay.

The main tidal movement for the northern isles of Orkney is through Stronsay Firth, to the east of Area 7, with only residual movement south from Gairsay and through Wide Firth into Shapinsay Sound. Shapinsay Sound does, however, experience strong tidal streams, accelerated through the String, which connects Shapinsay Sound to Wide Firth. Tidal movement slows within the main body of Shapinsay Sound, with negligible tidal streams being found in bays such as Carness, Inganess and Meil.

Shapinsay Sound is generally moderately exposed to wave action, with the eastern end of Shapinsay Sound being more exposed from the east, although 'shallow' water offshore (less than 35 m depth) gives some protection. Sheltered areas of the sound occur in embayments and on the sides of headlands sheltered from prevailing wave and current action.

The shores are mostly rocky, with sandstone bedrock steps, gullies and boulders. The sublittoral substratum is predominantly mixed bedrock and boulders in shallow fringing areas, which grades to mixed sediment, the type of sediment varying with the degree of tidal streams and wave exposure. In sheltered areas such as Inganess Bay, fine sands predominate, with mud in Bay of Firth, while in more tide-swept areas, such as the String, mixed cobbles, pebbles and gravel occur.

The coast consists of low-lying cliffs with a number of bays and inlets. The upper Bay of Firth is complicated by a number of holms (islands) and skerries. The shore is backed by arable land with only two major areas of habitation, at Kirkwall and Finstown.

Marine biology

Marine biological surveys				
	<i>Survey method</i>	<i>No. of sites</i>	<i>Date of survey</i>	<i>Source</i>
<i>Littoral</i>	Recording (epibiota)	3	June 1995	MNCR survey 448
	Recording (epibiota)	6	July-August 1996	MNCR survey 442
<i>Sublittoral</i>	Recording (epibiota)	25	June 1995	MNCR survey 448
	Infaunal sampling (cores)	3	June 1995	MNCR survey 448
	Infaunal sampling (grab)	20	May 1987	Jones <i>et al.</i> 1987
	Infaunal sampling (grab)	15	May 1997	Unicomarine survey 683

Littoral

Shores in the Shapinsay Sound area are predominantly sheltered and very sheltered in nature, with moderately exposed shores occurring on the northern side of Shapinsay Sound which is open to wind and waves from the south-east.

In the moderately exposed areas of Shapinsay Sound, such as the west side of Helliar Holm at Saeva Ness, the shores comprise bedrock steps where the upper shore biotopes are similar to the more sheltered shores, possibly sheltered by the extent of bedrock lower down. Mid-shore biotopes are characterised by barnacle-fucoid mosaics of bladder wrack *Fucus vesiculosus* and the barnacle *Semibalanus balanoides* (FvesB). Below the barnacle-fucoid mosaic, serrated wrack *Fucus serratus* and *Himanthalia elongata* occur (Him), giving way to kelp *Laminaria digitata* and crustose coralline algae in the sublittoral fringe (Ldig.Ldig).

Sheltered shores in Wide Firth and the more sheltered parts of Shapinsay Sound comprise stepped bedrock backed by low-lying cliffs. The supralittoral is dominated by yellow and grey lichens (YG), which grade into *Verrucaria maura* (Ver.Ver) and channelled wrack *Pelvetia canaliculata* (Pel) which in turn grades into spiral wrack *Fucus spiralis* (Fspi). The mid-shore is dominated by knotted wrack *Ascophyllum nodosum* (Asc.Asc), often with a band of *F. vesiculosus* (Fves) between this and *F. serratus* on the lower shore (Fser.Fser). The sublittoral fringe is dominated by *L. digitata* (Ldig.Ldig).

The shores of Wide Firth are very sheltered in nature and are often fairly silted due to the low wave energy, which reduces the species richness in the area. Shores are level bedrock with a lush cover of fucoid algae and few other species. The upper shore is generally mixed substrata which support a mix of *P. canaliculata* and *F. spiralis* (Pel; Fspi). The mid-shore is covered with a dense canopy of *A. nodosum* with some *F. vesiculosus* occurring (Asc.Asc). The *A. nodosum* has a very dense epiphytic cover of the red alga *Polysiphonia lanosa*, a species very specific to growing on that alga. The lower shore is dominated by dense *Fucus serratus* (Fser.Fser) and the zone below this is almost exclusively of *Laminaria hyperborea* forest (Lhyp.Ft); the absence of the usual *L. digitata* zone is a phenomenon local to this area.

Sublittoral

Within Shapinsay Sound, species-rich *Laminaria hyperborea* kelp forests occur on stepped bedrock and boulders to a depth of approximately 14 m. A dense epibiota, consisting of ascidians, bryozoans and red algae, covers the *L. hyperborea*, due to the effect of strong tidal streams (Lhyp.TFt). Below 14 m the kelp gives way to beds of the horse mussel *Modiolus modiolus* (ModT). In sheltered areas and areas with unstable substrata, such as Inganess Bay, *L. hyperborea* is combined with *Laminaria saccharina* (LhypLsac.Ft). The skerry east of Helliar Holm shows a gradation, as the bottom type becomes less stable, from *L. hyperborea* on bedrock and boulders between 1 m and 9 m, to *L. saccharina* on sand and gravel below this (LsacX).

The shallow sublittoral on the south side of Wide Firth and Point of Backaquoy, in Bay of Firth, consists of boulders and cobbles with maerl rhodoliths, sand and gravel between. The boulders have a covering of crustose coralline algae and support kelps *L. hyperborea* and *L. saccharina* together with some *Saccorhiza polyschides* (LhypLsac.Ft). To the north-west of Quanterness, south-east of the entrance to Bay of Firth *L. saccharina* dominates, live maerl occurs between the boulders, along with maerl gravel and sand at 5 m. The sediment between the boulders is burrowed by terebellid worms (Lsac.Ft).

Caves, gullies and extensive vertical surfaces on stepped bedrock occur at Head of Work, Yinstay Bay and Car Ness. In the sublittoral fringe, dense kelps *Laminaria digitata* and *Alaria esculenta* grow on bedrock, which is encrusted by sponges, bryozoans and crustose red algae (Ala.Ldig). At greater depth *L. digitata* is replaced by *L. hyperborea* which grows on upper surfaces, ledges and occasional boulders to a depth of 14 m (Lhyp.Ft). Vertical bedrock surfaces between 5 m and 13 m depth support rich communities of ascidians, hydroids and sponges *Esperiopsis fucorum* and *Pachymatisma johnstonia*, with crevices and fissures harbouring brittlestars *Ophiothrix fragilis*.

No kelp park is found within Shapinsay Sound and Wide Firth. Its absence is believed to be due to substrata changes at critical depth where kelp park would normally occur. Instead of solid bedrock, the substrata gives way to a mixed, broken bottom, or to sediment unsuitable for kelp settlement.

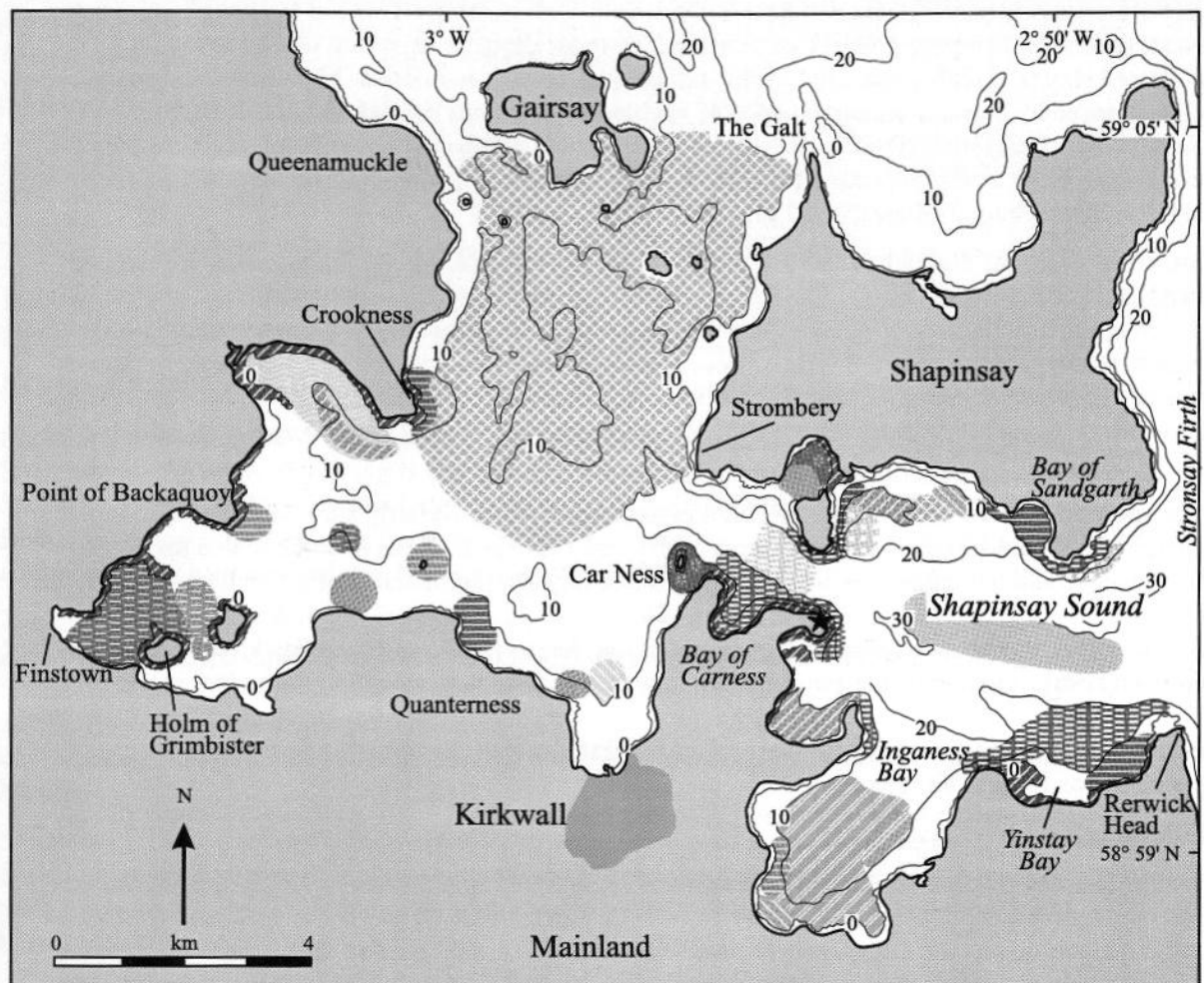


Figure 7.2 Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 7.1, cited literature and additional field observations). (Key to biotopes symbols on next page.)
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Shallow sediments of stable fine sand occur in most embayments of Shapinsay Sound. In Inganess Bay they extend to a depth of 12 m and support a rich infauna of polychaetes characterised by *Spio martinensis*, *Spiophanes bombyx*, *Ampharete falcata* and amphipods dominated by *Ampelisca typica* (SpiSpi). Conspicuous epifauna include sabellid worms, the brittlestar *Amphiura filiformis* and the anemone *Edwardsia* sp., with an algal mat covering the sediment. In Bay of Sandgarth on the north side of the sound the sediments are coarse sand and maerl-gravel, possibly due to increased tidal streams, with sabellid worms and the holothurian *Neopentadactyla mixta* often present (FaS). Maerl medallions (a flattened growth form) occur here in considerable numbers at about 20 m depth. This growth form may be indicative of the greater water movement experienced here.

Within Bay of Isbister, north-west of Wide Firth, a sandy bottom at around 5 m depth has a patchy algal mat, mainly of *Stictyosiphon* sp. The sediment is well-worked, with numerous mounds of lugworm *Arenicola marina*, terebellid and sabellid worms, as well as the anemone *Halcyon chrysanthellum* apparent on the surface. Infauna is characterised by sparse polychaetes, mainly *Chaetozone setosa*, *Scalibregma* spp., and large numbers of the bivalve *Abra alba* (AbrNucCor). This biotope is more characteristic of deeper areas, but occurs in the shallows at 5 m due to the sheltered nature of the site. Occasional patches of gravel and empty shells support sparse bootlace weed *Chorda*

	Moderately exposed littoral rock with barnacles, fucoids and red algae (FvesB; Him; Ala.Ldig)		Maerl bed (Phy; Phy.R)
	Sheltered littoral rock with dense fucoid algae (Fves; Asc.Asc; Ldig.Ldig)		Infralittoral fine sand with polychaetes and bivalves (NcirBat; FabMag)
	Sublittoral caves (SCAs; SCAs.DenCla)		Infralittoral muddy sand with spionid polychaetes (SpiSpi)
	Infralittoral rock with kelp <i>Laminaria hyperborea</i> with dense red algae (Lhyp.Ft; Lhyp.Pk)		Sublittoral muddy sand with <i>Abra alba</i> , bivalves and polychaetes (AbrNucCor)
	Tide-swept infralittoral rock with kelp <i>Laminaria hyperborea</i> and faunal turf (Lhyp.TFt; Lhyp.TPk)		Cirralittoral muddy sand with <i>Virgularia mirabilis</i> (VirOph)
	Infralittoral rock with mixed kelps and scour-tolerant algae (XKScrR; PolAhn)		Infralittoral stable sediment with tubicolous polychaetes and <i>Ocnus planci</i> (TubeAP; Ocn)
	Infralittoral rock with mixed kelps <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> (LhypLsac.Ft)		Infralittoral mixed sediments (IMX)
	Infralittoral rock with kelp <i>Laminaria saccharina</i> and sparse red algae (Lsac.Ft)		Infralittoral mixed sediment with <i>Laminaria saccharina</i> (LsacX)
	Cirralittoral rock with <i>Flustra foliacea</i> (Flu.SerHyd)		Infralittoral mixed sediment with algal mats (Tra)
	Tide-swept <i>Modiolus</i> bed (ModT)		Infralittoral mixed sediment with <i>Venerupis senegalensis</i> (VsenMtru)
	Infralittoral gravel and sand with sparse infauna (FaS)		Cirralittoral mixed sediment (CMX)

filum and *L. saccharina*. In slightly deeper water (11 m) at the mouth of Bay of Isbister, epifauna is characterised by *L. saccharina* and large amounts of loose-lying algae, mainly the red alga *Phyllophora crispa*, cover much of the sediment, with ascidians, such as *Corella parallelogramma*, *Ascidiella aspersa* and *Clavelina lepadiformis* attached to the algae, and fanworms dominating the infauna (LsacX).

On the western side of Bay of Firth, at 4-6 m depth, the substratum is soft flocculent mud overlying cobbles and pebbles. The sediment supports a mat of the red alga *Trailiella*, with a number of ascidians amongst the algae and an infauna comprising large numbers of the holothurian *Ocnus planci* (Ocn). At the centre of the mouth to Bay of Firth, the bottom comprises a level plain of stable fine sand at 9-10 m depth, burrowed extensively by tubicolous polychaetes and washed by a gentle tidal stream (TubeAP). Adjacent to this area there is mixed sediment with an infauna characterised by the bivalves *Venerupis senegalensis* and *Mya truncata*, and rich in amphipods and polychaetes, with large numbers of the brittlestar *Amphipholis squamata* (VsenMtru). Further south-west, to the west of Holm of Grimbister, the bottom changes to a mix of fine sandy mud with some shell-gravel around 2 m depth. The sediment here is burrowed extensively by tubicolous polychaetes and has a covering mat of *Trailiella*, with attached ascidians and blue green algae (Tra).

In central Wide Firth, to 15 m depth, the bottom is a bed of maerl mixed with sand and dead maerl, with occasional cobbles. The habitat is tide-swept and dominated by fanworms *Sabella pavonina*, *Polycirrus* sp. and *Chone duneri* all occurring in very high numbers, with occasional kelp plants attached to cobbles, the razor clam *Ensis arcuatus*, and the anemone *Cerianthus lloydii* and the tube worm *Chaetopterus variopedatus* as conspicuous infauna (Phy).

Horse mussel *Modiolus modiolus* and brittlestar *Ophiothrix fragilis* beds are found between Hackness Point and Yinstay Bay, between 28 m and 29 m depth (Oph). In the areas of tidal acceleration through

the String, *M. modiolus* grades into a substratum of small cobbles and pebbles supporting a turf of erect hydroids and bryozoans at a depth of around 28 m (Flu.SerHyd).

Nature conservation

No designated conservation sites at present.

Human influences

Coastal developments and uses

The coast around Shapinsay Sound is predominantly undeveloped. However, the central area is dominated by Kirkwall, the main town on Orkney, which discharges sewage into the Bay of Kirkwall, resulting in a reduction of water quality (E. Murray, pers. obs.). There are plans to construct a sewage treatment works to carry out at least primary treatment at Head of Work, adjacent to the String, where the treated effluent would be dispersed by the strong tides. At the head of Bay of Firth is the small village of Finstown, which discharges sewage into the inner parts of Bay of Firth.

No evidence of nutrient run-off from arable land was observed.

Marine developments and uses

The area is fished extensively for scallops *Pecten maximus*, predominantly by diving, although some scallop dredging also takes place. Fishing also occurs within the area, mainly potting for crabs *Cancer pagurus* and other crustaceans. The area supports the main concentration of mariculture in Orkney, with licences for six salmon *Salmo salar* farms and a salmon hatchery, and for a number of mussel, scallop and oyster farms concentrated in Bay of Firth and Inganess Bay (La Tene Maps 1999).

References and further reading

Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P., Davidson, N.C., & Buck, A.L. eds. 1997. *Coasts and seas of the United Kingdom. Region 2: Orkney*. Peterborough, Joint Nature Conservation Committee.

Jones, A.M., Simpson, J.A., Atkins, S.M., & Noble, S. 1987. *A survey of the potential impact of proposed fish farming developments on Inganess Bay and the lower reaches of Wideford Burn*. Unpublished, University of Dundee, Environmental Advisory Unit.

La Tene Maps. 1999. *Aquaculture – Orkney and Shetland Islands*. 3rd ed. Dublin, La Tene Maps.

Thorpe, K. 1998. *Marine Nature Conservation Review Sectors 1 & 2. Lagoons in Shetland and Orkney: area summaries*. Peterborough, Joint Nature Conservation Committee. (Coasts and seas of the United Kingdom. MNCR series.)

Sites surveyed

Survey 442: 1996 MNCR littoral survey of Deer Sound and Wide Firth, Orkney (MNCR, unpublished data).

Survey 448: 1995 MNCR survey of Shapinsay Sound and Wide Firth, Orkney (MNCR, unpublished data).

Survey 682: 1987 EAU sublittoral grab survey of Inganess Bay and the lower reaches of Wideford Burn, May 1987 (Jones *et al.* 1987).

Survey 683: 1997 Unicomarine infaunal survey of Hoy Sound and Shapinsay Sound.

Littoral sites

<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
442	1	Car Ness, the String.	HY 468 146	59°00.9'N 02°55.5'W	YG; Ver.Ver; Pel; Fspi; Asc.Asc; Fser.Fser; Lhyp.Ft
442	2	Skerry of Work, Wide Firth.	HY 482 133	59°00.2'N 02°54.1'W	Ver.Ver; Pel; Fspi; Fves; Asc.Asc; Fser.Fser; SwSed; Lhyp.Ft
442	5	Broad Taing, Wide Firth.	HY 420 173	59°02.3'N 03°00.6'W	Pel; Fspi; Fves; Fser.Fser; Ldig.Ldig.Bo; Lhyp.Ft
442	6	Skaill, Bay of Isbister, Wide Firth.	HY 398 185	59°02.9'N 03°02.9'W	YG; Pel; Fspi; Asc.Asc; FX; FserX; Tal; LhypLsac.Ft
442	9	Skerries Of Coubister, Wide Firth.	HY 380 148	59°00.9'N 03°04.7'W	Fspi; Asc.Asc; Fser.Fser; SwSed; LhypLsac.Ft
442	10	NW Shore of Holm of Grimbister, Wide Firth.	HY 378 137	59°00.3'N 03°04.9'W	Pel; Fves; Asc.Asc; Fser.Fser; LhypLsac.Ft
448	2	W side of Rerwick Head, Shapinsay Sound.	HY 537 117	58°59.4'N 02°48.3'W	YG; Ver.Ver; Pel; Fspi; Asc.Asc; Fser.Fser; Ldig.Ldig
448	26	Saeva Ness, Shapinsay Sound.	HY 484 149	59°01.1'N 02°53.9'W	YG; Ver.Ver; Pel; Fspi; FvesB; Him; Ldig.Ldig
448	28	Holm Sound, Shapinsay Sound.	HY 486 161	59°01.7'N 02°53.7'W	Ver.Ver; Pel; Fspi; Asc.T; Fserr.T

Sublittoral sites

<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
448	1	W of Rerwick Head, Shapinsay Sound.	HY 537 124	58°59.8'N 02°48.3'W	Lhyp.Ft
448	3	Scare Gun, Shapinsay Sound.	HY 518 116	58°59.4'N 02°50.3'W	Lhyp.TFt
448	4	Yinstay Head, Shapinsay Sound.	HY 506 113	58°59.2'N 02°51.5'W	Lhyp.TFt; LsacX
448	5	N of Weethick Head, Shapinsay Sound.	HY 495 100	58°58.5'N 02°52.6'W	FaS
448	6	Centre of Inganess Bay, Shapinsay Sound.	HY 493 107	58°58.8'N 02°52.9'W	SpiSpi
448	7	Tang of Berstane, Shapinsay Sound.	HY 475 096	58°58.2'N 02°54.7'W	LhypLsac.Ft; LsacX
448	8	S of Head of Holland, Shapinsay Sound.	HY 492 118	58°59.4'N 02°53.0'W	Lhyp.TFt; LsacX
448	9	Bay of Meil, Shapinsay Sound.	HY 480 121	58°59.6'N 02°54.2'W	LsacX
448	10	E of Head of Work, Shapinsay Sound.	HY 485 137	59°00.4'N 02°53.7'W	Ala.Ldig; SCAs; SCAs.DenCla; Lhyp.TFt; Lhyp.TPk
448	11	N of Carness, Shapinsay Sound.	HY 427 139	59°00.5'N 02°59.7'W	Lhyp.Ft
448	12	NW of Crow Ness, Wide Firth.	HY 444 129	59°00.0'N 02°58.0'W	Lsac.Ft
448	13	E of Ramberry, Wide Firth.	HY 467 146	59°00.9'N 02°55.6'W	XKScrR
448	14	E side of Quanerness Skerry, Wide Firth.	HY 421 148	59°01.0'N 03°00.4'W	LhypLsac.Ft
448	15	NW of Quanter Ness, Wide Firth.	HY 407 144	59°00.8'N 03°01.9'W	Lsac.Ft
448	16	N of Holm of Grimbister, Wide Firth.	HY 380 137	59°00.4'N 03°04.7'W	XKScrR; LsacX; Tra
448	17	Basin E of Finstown, Wide Firth.	HY 374 143	59°00.7'N 03°05.3'W	Ocn
448	18	Point of Backaquoy, Wide Firth.	HY 392 155	59°01.3'N 03°03.4'W	LhypLsac.Ft
448	19	E of Mou Ness, Wide Firth.	HY 407 172	59°02.3'N 03°01.9'W	LsacX
448	20	Bay of Isbister, Wide Firth.	HY 401 178	59°02.6'N 03°02.6'W	LsacX
448	21	Between Isbister Bay and Quanerness, Wide Firth.	HY 407 153	59°01.2'N 03°01.9'W	TubeAP
448	22	Centre of Wide Firth.	HY 432 156	59°01.4'N 02°59.3'W	LsacX
448	23	The String, Shapinsay Sound.	HY 482 148	59°01.0'N 02°54.1'W	Flu.SerHyd
448	24	Elwick, Shapinsay, Shapinsay Sound.	HY 483 162	59°01.8'N 02°54.0'W	XKScrR; FaS
448	25	S of Helliard Holm, Shapinsay Sound.	HY 480 150	59°01.1'N 02°54.2'W	Lhyp.TPk
448	27	E of Helliard Holm, Shapinsay Sound.	HY 488 154	59°01.4'N 02°53.5'W	Lhyp.Ft; ModT
448	29	S of Ward Hill, Shapinsay, Shapinsay Sound.	HY 502 156	59°01.5'N 02°52.0'W	Phy.R; LsacX
448	30	Bay of Sandgarth, Shapinsay Sound.	HY 516 154	59°01.4'N 02°50.5'W	Lhyp.Ft; PolAhn; FaS

Sublittoral sites continued

Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
448	31	Central Shapinsay Sound.	HY 528 146	59°01.0'N 02°49.3'W	ModT
682	1	Station 1, Inganess Bay.	HY 475 090	58°57.9'N 02°54.7'W	FabMag
682	2	Station 2, Inganess Bay.	HY 477 088	58°57.8'N 02°54.5'W	NcirBat
682	3	Station 3, Inganess Bay.	HY 476 093	58°58.0'N 02°54.6'W	SpiSpi
682	4	Station 4, Inganess Bay.	HY 479 091	58°57.9'N 02°54.3'W	SpiSpi
682	5	Station 5, Inganess Bay.	HY 483 092	58°58.0'N 02°53.9'W	SpiSpi
682	6	Station 6, Inganess Bay.	HY 486 092	58°58.0'N 02°53.6'W	IMS
682	7	Station 7, Inganess Bay.	HY 492 089	58°57.8'N 02°53.0'W	SpiSpi
682	8	Station 8, Inganess Bay.	HY 475 094	58°58.1'N 02°54.7'W	IMS
682	9	Station 9, Inganess Bay.	HY 478 094	58°58.1'N 02°54.4'W	SpiSpi
682	10	Station 10, Inganess Bay.	HY 485 096	58°58.2'N 02°53.7'W	IMS
682	11	Station 11, Inganess Bay.	HY 489 095	58°58.2'N 02°53.3'W	SpiSpi
682	12	Station 12, Inganess Bay.	HY 476 097	58°58.3'N 02°54.6'W	IMS
682	13	Station 13, Inganess Bay.	HY 481 098	58°58.3'N 02°54.1'W	SpiSpi
682	14	Station 14, Inganess Bay.	HY 485 098	58°58.3'N 02°53.7'W	IMS
682	15	Station 15, Inganess Bay.	HY 490 097	58°58.3'N 02°53.2'W	SpiSpi
682	16	Station 16, Inganess Bay.	HY 493 098	58°58.3'N 02°52.9'W	IMS
682	17	Station 17, Inganess Bay.	HY 483 101	58°58.5'N 02°53.9'W	SpiSpi
682	18	Station 18, Inganess Bay.	HY 484 103	58°58.6'N 02°53.8'W	IMS
682	19	Station 19, Inganess Bay.	HY 487 109	58°58.9'N 02°53.5'W	SpiSpi
682	20	Station 20, Inganess Bay.	HY 490 114	58°59.2'N 02°53.2'W	IMS
683	1	Station 1.	HY 381 142	59°00.6'N 03°04.6'W	VsenMtru
683	2	Station 2.	HY 405 177	59°02.5'N 03°02.2'W	AbrNucCor
683	3	Station 3.	HY 412 168	59°02.0'N 03°01.3'W	AbrNucCor
683	4	Station 4.	HY 411 155	59°01.4'N 03°01.5'W	Cap
683	5	Station 5.	HY 438 201	59°03.9'N 02°58.7'W	Phy
683	6	Station 6.	HY 469 208	59°04.3'N 02°55.5'W	Phy
683	7	Station 7.	HY 448 184	59°03.0'N 02°57.6'W	Phy
683	8	Station 8.	HY 437 161	59°01.7'N 02°58.8'W	Phy
683	9	Station 9.	HY 448 129	59°00.0'N 02°57.6'W	VirOph
683	10	Station 10.	HY 482 161	59°01.8'N 02°54.1'W	IMX
683	11	Station 11.	HY 505 157	59°01.6'N 02°51.7'W	FabMag
683	12	Station 12.	HY 503 138	59°00.5'N 02°51.8'W	CMX
683	13	Station 13.	HY 527 131	59°00.2'N 02°49.3'W	CMX
683	14	Station 14.	HY 494 109	58°59.0'N 02°52.8'W	VsenMtru
683	15	Station 15.	HY 480 096	58°58.2'N 02°54.2'W	AbrNucCor

Compiled by: Frank Fortune, Karen Begg & Eleanor Murray

Papa Westray

Location

Position (centre)	HY 50 53	59°53'N 02°21.5'W
Administrative area	Orkney Islands	
Conservation agency/area	Scottish Natural Heritage	North areas (Northern Isles)

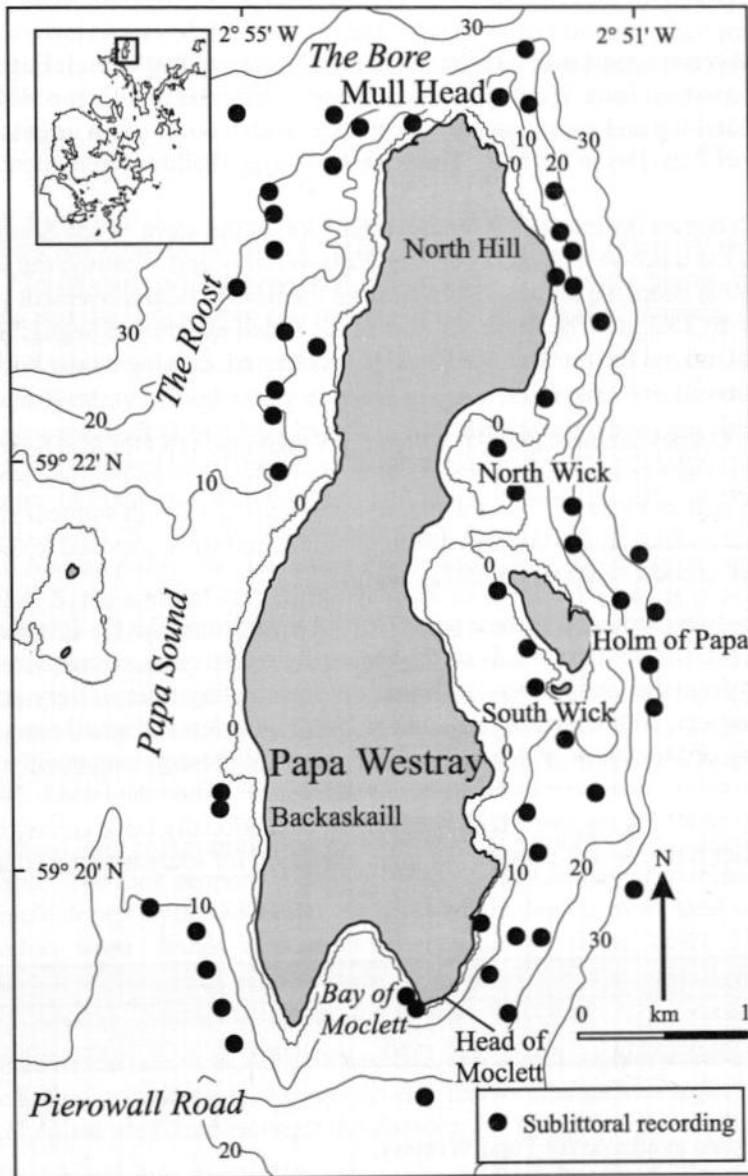


Figure 8.1 Main features of the area, showing sites surveyed.
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Physical features

<i>Physiographic type</i>	Island (open coast with embayments); Sound
<i>Length of coast</i>	25.2 km
<i>Bathymetry</i>	To the north, east and south, the sea bed slopes steeply to 30 m with the 30 m contour occurring within 1 km of the coast, then levels off. The east side is dominated by two large shallow embayments, South Wick and North Wick. The north-west side of the island slopes gently to 30 m, the west side is dominated by Papa Sound, which is oriented north-south and is less than 10 m in all areas.
<i>Wave exposure</i>	The island is very exposed to the north-west, exposed to the east, moderately exposed to the south, and sheltered in the embayments.
<i>Tidal streams</i>	Strong to very weak.
<i>Tidal range</i>	3.2 m (mean springs); 1.8 m (mean neaps)
<i>Salinity</i>	Fully marine

Introduction

Papa Westray is the second-most northerly island in the Orkney archipelago. It lies off the north-east coast of Westray, separated from Westray by Papa Sound to the west and Pierowall Road to the south. Papa Westray is 7 km long and approximately 2 km wide, with a north-south orientation; the small island of the Holm of Papa lies to the east. There are two large, shallow embayments, North Wick and South Wick, indenting the east side of Papa Westray; offshore, the sea bed slopes steeply to 30 m then levels off, with depths not exceeding 50 m within 3 km of the coast. Papa Sound lies to the west of the island; this is the narrowest channel between Papa Westray and Westray; the whole of the sound is less than 10 m deep, the narrow sill causing an increase in tidal movement over it, with tidal streams reaching up to 3 knots. The south and east of the island experience negligible tidal streams, but water movement around the north of the island is accelerated, causing a tidal bore with speeds reaching over 5 knots.

As with most of the Orkney archipelago, Papa Westray's geology is of Old Red Sandstone (Mykura 1975), which is folded and eroded to create cliffs with many fissures, which makes it ideal for seabirds. Sea temperatures average 7°C in winter and reach up to 14°C in summer (Lee & Ramster 1981). Wave exposure varies from very exposed to the north and west, exposed to the east, moderately exposed to the south, and sheltered in the embayments.

Papa Westray is low-lying, with the highest point only 48 m above sea level. It is sparsely populated and mainly of rural grazing land, for small-scale sheep and beef farming; consequently there is little anthropogenic input from the land and the quality of the surrounding water is very good. There is very little coastal development, with the main ferry pier in Bay of Moclett and small piers in South Wick and Backaskaill; Bay of Moclett provides anchorage for a small fishing fleet, mainly potting for crab and lobster *Homarus gammarus* in the inshore waters surrounding the island. North Hill in the north of the island is an RSPB reserve which supports an exceptionally large colony of Arctic terns along with many other birds, which provide the main attraction for tourists to the island.

Marine biology**Marine biological surveys**

	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (<i>Seasearch</i>)	56	July 1997	MCS survey 691

Littoral

There are no littoral data available for Papa Westray.

Sublittoral

Towards the north of Papa Westray, the sublittoral is dominated by bedrock, with steeply-sloping rock and deep gullies inshore and stepped bedrock platforms offshore. Offshore, the Bore north of Mull Head and the northern reaches of Papa Sound are subject to appreciable tidal streams, reflected in the biotopes present. To the west of the island, there is a mixture of stepped bedrock platforms and pockets of coarse sediment offshore, with rugged, gullied bedrock inshore. This area is moderately

exposed to wave action. The inlet of South Wick and offshore to the south of the island is characterised by coarse, clean sand. One site to the south-east has maerl-gravel, the only maerl recorded from Area 8.

Infralittoral rock to the north and west of the island is characterised by dense *Laminaria hyperborea* kelp forest with a faunal turf on the rock below and on kelp stipes (LhypFa). The understorey is characterised by robust red algae, including *Odonthalia dentata* and *Delesseria sanguinea*, interspersed with anemones *Sagartia elegans* and *Urticina felina*. The stipes are heavily laden with red algae and breadcrumb sponge *Halichondria panicea*, the hydroid *Sertularia argentea*, bryozoans including *Alcyonidium diaphanum* and the ascidian *Botryllus schlosseri*. Such stipe fauna is very characteristic of tide-swept kelp communities in Orkney. Circalittoral tide-swept biotopes are dominated by the mussel *Musculus discors*, hydroids and dead-man's fingers *Alcyonium digitatum* (Mus). This biotope (also found in the North Ronaldsay Firth to the north of Sanday) is characteristic of very turbulent tide-swept areas of northern Orkney. The mussels dominate the upward-facing surfaces, with *S. elegans* and *U. felina* and the hydroid *Nemertesia antennina* between, and starfish *Asterias rubens* on the surface. Vertical faces are covered with *A. digitatum* and jewel anemones *Corynactis viridis*.

Exposed infralittoral bedrock to the north and east of the islands in the lee of tidal movement support *L. hyperborea* forest with some *Alaria esculenta* and dense red algae (LhypR.Ft). The understorey is characterised by robust red algae *O. dentata*, *Cryptopleura ramosa*, and *Nitophyllum punctum* and stipes colonised by *Plocamium cartilagineum* and *Ptilota gunneri*. In some places, red algae are confined to the stipes and the understorey comprises a dense faunal turf of mussels, *A. digitatum* and anemones (LhypFa).

The west side of Papa Westray is moderately exposed to wave action and infralittoral communities are of *L. hyperborea* forest and park (Lhyp.Ft; Lhyp.Pk). Red algal assemblages are similar in composition to the more exposed kelp forests, although abundances are generally lower. There are more obvious expanses of open rock with coralline and non-coralline red algal crusts. Mobile fauna occur more frequently amongst the kelp, for example crabs *Pagurus bernhardus*, *Hyas araneus*, *Cancer pagurus* and *Necora puber*, fish including *Pollachius* spp., wrasse *Labrus* spp. and scorpion fish *Taurulus bubalis*. Some areas of kelp forest and park have intense grazing pressure from the urchin *Echinus esculentus* (LhypGz.Ft, LhypGz.Pk). In these areas there is very sparse algal growth and the rock and stipes are generally covered with coralline crusts. This grazing pressure is also observed in circalittoral communities, with rock surfaces covered with encrusting algae, and fauna characterised by sparse *A. digitatum*, the ascidians *Ascidia virginea* and *Ciona intestinalis* and sparse brittlestars (FaAIC). In deeper areas, 28 m depth, dense carpets of brittlestars *Ophiothrix fragilis* and *Ophiocomina nigra* are found (Oph).

In North Wick, sheltered kelp communities occur on boulder and cobble slopes interspersed with patches of coarse sand. The rock supports a mixture of the kelps *Laminaria saccharina*, *Saccorhiza polyschides* and scour-tolerant algae (XKScrR). In areas where there is more sand and less rock, dense stands of bootlace weed *Chorda filum* occur between the kelp (LsacChoR). Elsewhere, to the south-east and south side of the island, shallow bedrock supports a mixture of *L. hyperborea* and *L. saccharina* (LhypLsac.Ft). These areas are sparse in flora and fauna.

Shallow fine, stable sediment occurs west of Backaskaill. The stable sediment off Backaskaill supports a dense bed of eelgrass *Zostera marina* (Zmar). Brown filamentous algae, *C. filum* and the occasional, small kelp plant are found amongst the *Zostera*.

Shallow coarse sediment occurs in South Wick and to the south of the island. Sediment in South Wick supports sparse lugworms *Arenicola marina* and occasional bivalve species, including *Ensis* spp. and *Venus verrucosa* (IGS). On the open coast, the same sediment infaunal biotope occurs with the addition of the burrowing anemone *Cerianthus lloydii*. In these areas, however, there is a sparse canopy of *L. saccharina* often with other brown algae (LsacX). Offshore from the head of Moclett, in 22 m depth, the sediment is waved and contains some live maerl. Here the sea cucumber *Neopentadactyla mixta* is found (Ven.Neo).

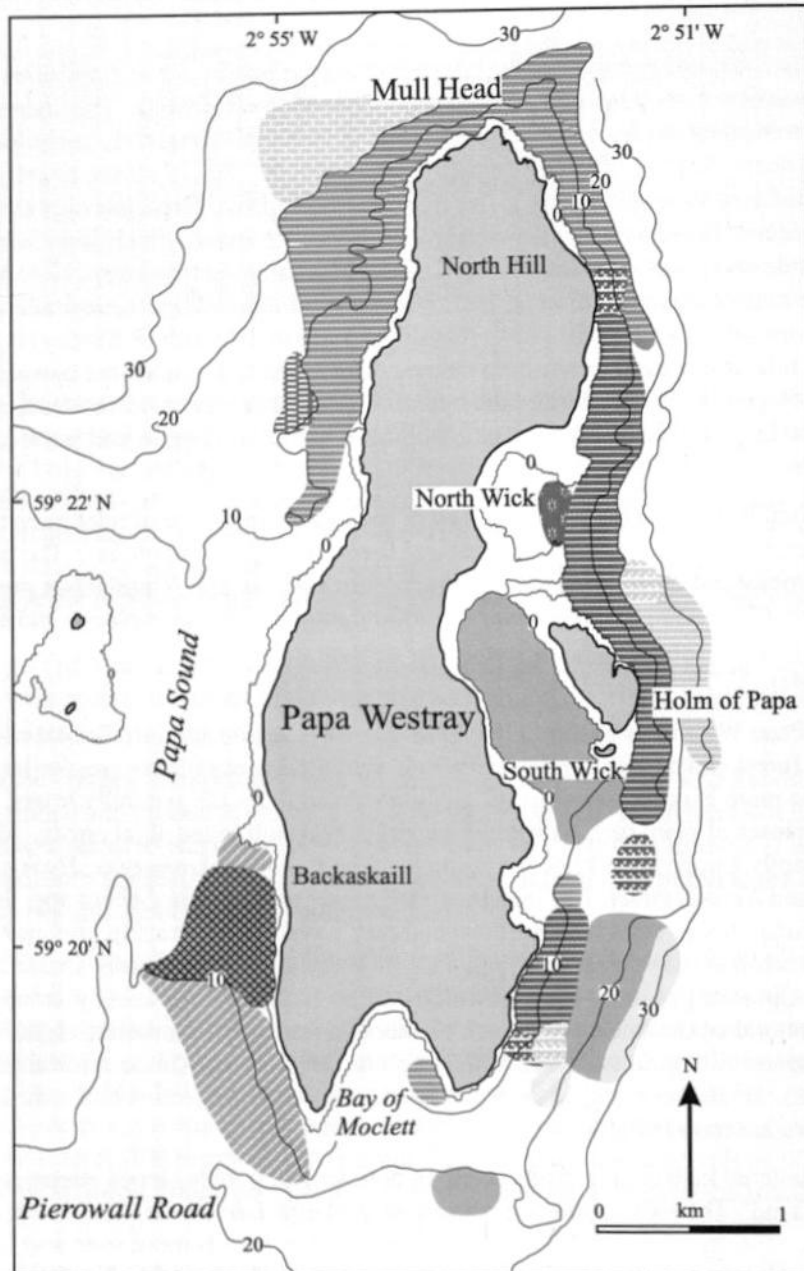


Figure 8.2 Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 8.1, cited literature and additional field observations). (Key to biotopes symbols on next page.)
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Nature conservation

Conservation sites		
Site name	Status	Main features
Papa Westray	SPA	Ornithological
North Hill	SSSI; RSPB; NCR	Ornithological; botanical
Holm of Papa Westray	SSSI	Ornithological

	Infralittoral rock with kelp <i>Laminaria hyperborea</i> , a faunal turf and dense red algae (LhypFa; LhypR.Ft)		Circalittoral rock with sparse fauna (FaAlc)
	Infralittoral rock with kelp <i>Laminaria hyperborea</i> and dense red algae (Lhyp.Ft; Lhyp.Pk)		Circalittoral rock or mixed substrata with dense brittlestars (Oph)
	Tide-swept infralittoral rock with kelp <i>Laminaria hyperborea</i> and faunal turf (Lhyp.TFt)		Infralittoral gravels and sands (IGS)
	Infralittoral rock with grazed kelp <i>Laminaria hyperborea</i> (LhypGz.Ft; LhypGz.Pk)		Circalittoral gravels and sands (CGS)
	Infralittoral rock with mixed kelps and scour-tolerant algae (XKScrR)		Coarse sand and gravel with venerid bivalves (Ven.Neo)
	Infralittoral rock with mixed kelps <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> (LhypLsac.Ft)		Infralittoral fine sediment with <i>Zostera marina</i> beds (Zmar)
	Tide-swept sublittoral mussel <i>Musculus discors</i> bed (Mus)		Infralittoral coarse sediment with <i>Laminaria saccharina</i> (LsacX)

Human influences

Coastal developments and uses

Most of the land is used for grazing and silage production to support sheep and cattle. There are scattered houses and a small airstrip. The coast is relatively undeveloped, with the main ferry pier and anchorage in Bay of Moclett, and smaller piers and jetties at Backaskaill and South Wick.

There is an RSPB reserve at North Hill, and Papa Westray is a Special Protection Area for its seabird populations, which attract a large proportion of the visitors to the island.

Marine developments and uses

Small-scale potting for crustaceans occurs around Papa Westray; small boats are based at Moclett and Backaskaill.

References and further reading

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- Lee, A.J., & Ramster, J.W. 1981. *Atlas of the seas around the British Isles*. Lowestoft, Ministry of Agriculture, Fisheries and Food, Directorate of Fisheries Research.
- Mykura, W. 1975. The geological basis of the Orkney environment. In: *The natural environment of Orkney. Proceedings of the Nature Conservancy Council Symposium held in Edinburgh on 26-27 November 1974*, ed. by R. Goodier. Edinburgh, Nature Conservancy Council.

Sites surveyed

Survey 691: 1997 MCS *Seasearch* sublittoral survey of Papa Westray.

Sublittoral sites

Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
691	1	Fowl Craig, Papa Westray.	HY 510 543	59°22.3'N 02°51.7'W	LhypR.Ft; AlcByH; AlcC
691	2	Fowl Craig, Papa Westray.	HY 508 546	59°22.5'N 02°51.8'W	LhypGz.Ft
691	3	Fowl Craig, Papa Westray.	HY 508 544	59°22.4'N 02°51.9'W	Lhyp.Ft
691	4	Fowl Craig, Papa Westray.	HY 508 548	59°22.6'N 02°51.9'W	Lhyp.TFt; AlcByH
691	5	NE of Mull Head, Papa Westray.	HY 504 558	59°23.1'N 02°52.3'W	LhypR.Ft
691	6	North Wick Bay, Papa Westray.	HY 506 536	59°21.9'N 02°52.1'W	IR; Lhyp.Ft
691	7	Surhoose Taing, Papa Westray.	HY 504 530	59°21.6'N 02°52.3'W	Lhyp.Ft; FaS
691	8	Centre of North Wick Bay, Papa Westray.	HY 503 532	59°21.7'N 02°52.4'W	LsacChoR; XKScrR
691	9	South Wick, Papa Westray.	HY 504 522	59°21.2'N 02°52.3'W	IGS
691	10	East Westray, Papa Westray.	HY 505 517	59°20.9'N 02°52.2'W	IGS
691	11	South Wick, southern end, Papa Westray.	HY 505 514	59°20.7'N 02°52.2'W	IGS
691	12	W of North Hill, Papa Westray.	HY 486 531	59°21.7'N 02°54.2'W	LhypR.Ft
691	13	Offshore North Hill, Papa Westray.	HY 486 552	59°22.8'N 02°54.2'W	LhypFa; LhypR.Ft
691	14	Papa Westray.	HY 486 535	59°21.9'N 02°54.2'W	Lhyp
691	15	Papa Sound, Papa Westray.	HY 486 537	59°22.0'N 02°54.2'W	Lhyp.TFt
691	16	W of North Hill, Papa Westray.	HY 486 541	59°22.2'N 02°54.2'W	Lhyp.TFt
691	17	Mull Head, Papa Westray.	HY 496 557	59°23.1'N 02°53.1'W	LhypR.Ft
691	18	W of Mull Head, Papa Westray.	HY 492 557	59°23.1'N 02°53.5'W	Mus
691	19	Mull Head, Papa Westray.	HY 491 557	59°23.1'N 02°53.7'W	Mus
691	20	SW Mull Head, Papa Westray.	HY 484 558	59°23.1'N 02°54.4'W	MytHAs
691	21	Post Office, Papa Westray.	HY 481 508	59°20.4'N 02°54.7'W	Lsac.Ft; Zmar
691	22	Down the road from the Post Office (!), Papa Westray.	HY 481 507	59°20.3'N 02°54.7'W	Zmar
691	23	Moclett Pier, Papa Westray.	HY 494 493	59°19.6'N 02°53.3'W	LhypLsac.Ft; IGS
691	24	Bay of Moclett, Papa Westray.	HY 494 493	59°19.6'N 02°53.3'W	IGS
691	25	W of Coastguard lookout, Papa Westray.	HY 489 540	59°22.2'N 02°53.8'W	LhypR.Ft
691	26	W of Mull Head, Papa Westray.	HY 485 551	59°22.7'N 02°54.2'W	LhypFa; Mus
691	27	Off the Roost, Near Brinkwall, Papa Westray.	HY 490 554	59°22.9'N 02°53.8'W	LhypR.Ft; AlcByH
691	28	S of the Roost, Papa Westray.	HY 483 545	59°22.4'N 02°54.5'W	LhypR.Ft
691	29	S of the Roost, Papa Westray.	HY 486 548	59°22.6'N 02°54.1'W	Lhyp
691	30	SW corner of Papa Westray.	HY 479 494	59°19.7'N 02°54.9'W	IGS; LsacX
691	31	W of Vest Ness, Papa Westray.	HY 479 491	59°19.5'N 02°54.8'W	IGS; LsacX
691	32	W coast, Horse Flags area, Papa Westray.	HY 481 489	59°19.4'N 02°54.6'W	IGS; LsacX
691	33	SW Papa Westray.	HY 476 500	59°20.0'N 02°55.2'W	Zmar; LsacX
691	34	Papa Sound, Papa Westray.	HY 478 497	59°19.8'N 02°55.0'W	IGS
691	35	Bay of Burland, Papa Westray.	HY 503 505	59°20.3'N 02°52.4'W	LhypLsac.Ft
691	36	SE Papa Westray.	HY 504 503	59°20.1'N 02°52.3'W	Lhyp.Ft
691	37	Due E of Holm Papa, Papa Westray.	HY 513 513	59°20.7'N 02°51.3'W	AlcByH; Lhyp; Oph
691	38	SE Holm, Papa Westray.	HY 511 521	59°21.1'N 02°51.6'W	AlcByH; Lhyp; Oph
691	39	NE of North Hill, Papa Westray.	HY 511 498	59°19.9'N 02°51.5'W	CGS
691	40	S of Bay of Burland, Papa Westray.	HY 504 496	59°19.8'N 02°52.3'W	IGS
691	41	SE of Bay of Burland, Papa Westray.	HY 502 496	59°19.8'N 02°52.4'W	Lhyp.Ft
691	42	SE Papa Westray.	HY 501 491	59°19.5'N 02°52.5'W	Ven.Neo
691	43	S of Bill Flag, Papa Westray.	HY 500 493	59°19.7'N 02°52.6'W	MIR; LhypGz.Ft
691	44	E of North Hill, Papa Westray.	HY 505 562	59°23.4'N 02°52.2'W	Lhyp.TFt
691	45	Mull Head East, Papa Westray.	HY 506 545	59°22.4'N 02°52.0'W	LhypFa
691	46	E side of Papa Westray, between Boden and Fowl Flag.	HY 505 557	59°23.1'N 02°52.2'W	LhypGz.Ft; AlcByH
691	47	NE Papa Westray.	HY 507 551	59°22.8'N 02°51.9'W	LhypR.Ft; AlcByH; Mus
691	48	E of Holm of Papa, Papa Westray.	HY 513 516	59°20.9'N 02°51.3'W	Lhyp.Ft; Lhyp.Pk
691	49	S of Wick, Papa Westray.	HY 507 511	59°20.6'N 02°52.0'W	IGS
691	50	S of Holm, Papa Westray.	HY 509 507	59°20.4'N 02°51.7'W	LhypGz.Ft
691	51	NE of Papa Westray.	HY 513 520	59°21.1'N 02°51.3'W	IR
691	52	E of Holm, Papa Westray.	HY 513 524	59°21.3'N 02°51.3'W	Oph
691	53	N end of the Holm, Papa Westray.	HY 507 525	59°21.4'N 02°51.9'W	FoR; Oph; Ant
691	54	E Papa Westray (N of the Holm).	HY 508 528	59°21.5'N 02°51.8'W	LhypGz.Pk; FaAIC
691	55	S of Head of Moclett, Papa Westray.	HY 496 484	59°19.1'N 02°53.1'W	IGS
691	56	S Papa Westray.	HY 499 498	59°19.9'N 02°52.7'W	LhypGz.Pk; FaAIC

Compiled by: Eleanor Murray

Eday Sound

Location

Position (centre)	HY 57 35	59°12.0'N 02°45'W
Administrative area	Orkney Islands	
Conservation agency/area	Scottish Natural Heritage	Northern Isles

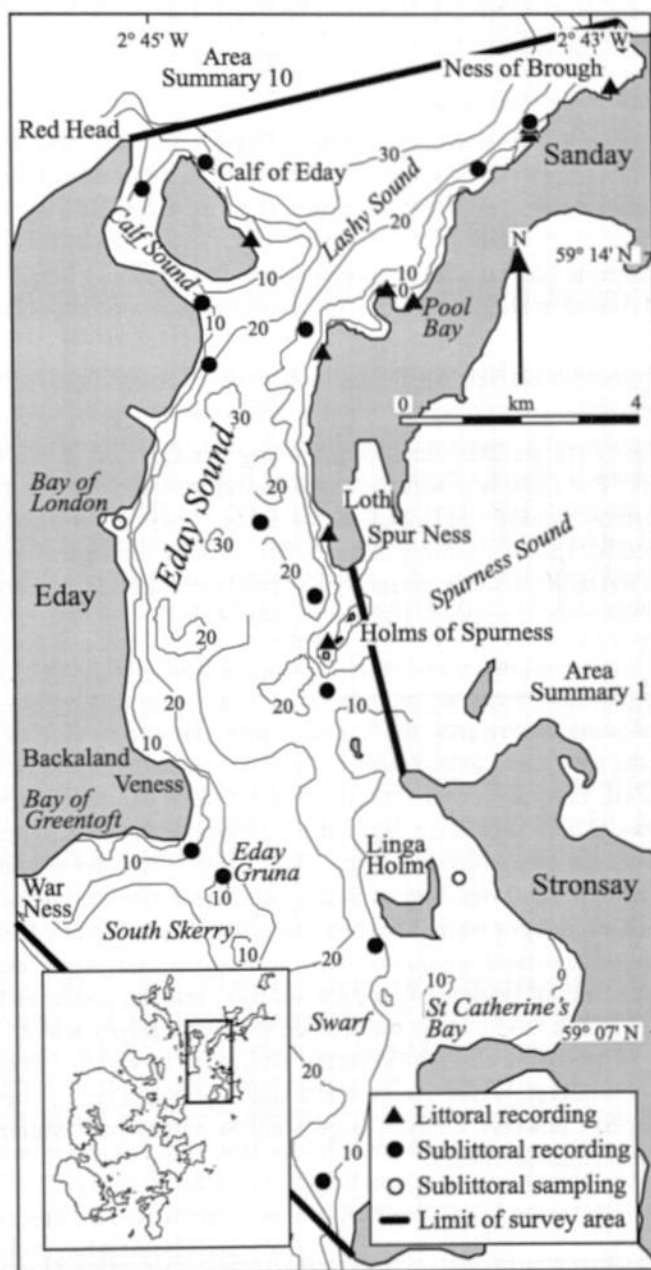


Figure 9.1 Main features of the area, showing sites surveyed.

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Physical features	
<i>Physiographic type</i>	Sound
<i>Length of coast</i>	68 km
<i>Bathymetry</i>	The Sound is generally shallow (< 20 m), with the sea bed sloping to deep water beyond the northern and southern limits. On all coasts, the shore shelves steeply; the centre of the sound is predominantly of level sediment at 20 m with a few deeper areas of 30-35 m. There is a bar at 20 m depth punctuated by shallower reefs towards the southern end of the sound running from Veness to St Catherine's Bay. St Catherine's Bay dominates the west coast of Stronsay and is very shallow, rarely exceeding 5 m in depth.
<i>Wave exposure</i>	Exposed to sheltered
<i>Tidal streams</i>	Moderate to strong (up to 5 knots in the northern reaches of the sound)
<i>Tidal range</i>	3.5 m (mean springs); 1.6 m (mean neaps)
<i>Salinity</i>	Fully marine

Introduction

Eday Sound is situated amongst the northern islands of Orkney and is flanked by Eday to the west, Sanday to the east and Stronsay to the south-east. The Sound has entrances to the north, south and east through which tidal movement is funnelled, resulting in increased tidal stream strength. Tidal streams range from moderate to strong. The geology is of Old Red Sandstone (Mykura 1975) which has been folded and eroded in places, adding complexity to the generally linear coastline. Wave exposure varies from exposed to sheltered due to the variation in littoral aspect and offshore shallows. Sea temperatures average 7°C in winter and reach up to 14°C in summer (Lee & Ramster 1981) Water quality is excellent, with underwater visibility up to 20 m in some areas during the MNCR survey (June-July 1997).

Eday, Sanday and Stronsay are predominantly of low-lying grazing land with few activities affecting the marine environment. The coast is generally undeveloped, with the exception of two harbours and Ro-Ro ferry slips at Loth on Sanday and Backaland on Eday. There are a number of fish cages to the north of Backaland, used for farming salmon *Salmo salar*. Scallop dredgers have been known to fish Eday Sound for *Pecten maximus*; fishing presently comprises potting for crab and lobster *Homarus gammarus*, and diver collection of scallops and razor clams *Ensis* sp.

The northern limit of Eday Sound is marked by Red Head on Eday and Ness of Brough on Sanday where the coastline is exposed to wave action with steep shores characterised by mussels *Mytilus edulis* and barnacles. Moving southwards, the Sound is split into two by Calf of Eday, with a narrow, shallow Calf Sound to the west and Lashy Sound to the east, the latter experiencing strong tidal streams. South of the Calf, Eday Sound runs north-south between parallel shores of Sanday to the east and Eday to the west. These shores are fairly steeply-sloping and moderately exposed to wave action. The steep slope continues sublittorally to ca. 20 m depth where the sea bed levels to a plain of mixed sediment. Between the south-west tip of Sanday and the north-west tip of Stronsay there is a tide-swept channel which exchanges water between Eday Sound and Sanday Sound. This channel is punctuated by the Holms of Spurness, a chain of small islands between which tidal streams are accelerated. At the southern limit between War Ness on Eday and the south-west tip of Stronsay, the Sound widens and tidal streams moderate as the sea bed slopes to deeper water. The centre of the Sound is interrupted by Eday Gruna and South Skerry which rise to within 5 m of the surface. The surrounding sea bed is of moderately tide-swept maerl and mixed sediment. The west coast of Stronsay is dominated by St Catherine's Bay, a large, shallow embayment which is sheltered from wave action by Linga Holm and the Swarf.

Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
<i>Littoral</i>	Recording (epibiota)	9	June-July 1997	MNCR survey 680
<i>Sublittoral</i>	Recording (epibiota)	14	June-July 1997	MNCR survey 681
	Infauanal sampling (diver cores)	2	June-July 1997	MNCR survey 681

Littoral

Steep rocky shores at the northern end of Eday are exposed to wave action and tunnels and arches have formed in places. The cliffs in the vicinity of Red Head are vertical and dominated by an extensive splash zone characterised by yellow and grey lichens higher up (YG) and black lichens lower down (Ver.Ver). The eulittoral zone comprises dense cover of mussels *Mytilus edulis* and barnacles (MytB), with few other species present, unable to survive due to the strong wave exposure. Horizontal bedrock in this area and on the Calf of Eday is sheltered by offshore shallows which allow the growth of algae, predominantly *Himantalia elongata* and robust foliose red algae on the lower shore (Him).

Steeply-sloping bedrock on Sanday also has an extensive splash zone (ca. 5 m in height) with a sparse cover of yellow and grey lichens (YG) and *Verrucaria maura* with *Porphyra umbilicalis* (Ver.Por). The eulittoral is characterised by a dense mosaic of mussels *M. edulis* and barnacles *Chthamalus stellatus* in the upper reaches of the zone and *Semibalanus balanoides* on the lower reaches (MytB). There are sparse plants of the red algae *Ceramium shuttleworthianum* and *Aglaothamnion sepositum* and the fucoids *Fucus spiralis* f. *nana* and *Fucus distichus* (Fdis). The sublittoral fringe has a dense canopy of *Alaria esculenta* with mussels and barnacles (Ala.Myt). Small embayments punctuate this part of the coast; bedrock platforms in these embayments are still subjected to considerable wave action, but have a less extensive supralittoral zone. The mid-eulittoral is characterised by a bladder wrack *Fucus vesiculosus* and barnacle mosaic (FvesB); the lower eulittoral has a turf of serrated wrack *Fucus serratus* with sponges and red algae (Fser.R).

The coastline flanking the middle and southern reaches of Eday Sound is linear and fairly uniform in nature. The shores are backed by low sea cliffs, often with small caves on the extreme upper shore with encrusting lichens *Verrucaria* spp. and algae *Blidingia minima*, *Hildenbrandia* sp. and *Phymatolithon lenormandii* (Chr). The shores are of level bedrock with scattered boulders and cobbles with a relatively narrow littoral width (ca. 50 m). The upper and mid-shore are afforded some shelter by the aspect of the coastline. Upper eulittoral rock is characterised by *F. spiralis* (Fspi) the presence of which reflects a decrease in wave exposure. The mid-eulittoral has a dense mosaic of knotted wrack *Ascophyllum nodosum* and *F. vesiculosus* (Asc.Asc). Lower shore rock supports *F. serratus* beneath which is a dense turf of red algae, predominantly *Mastocarpus stellatus*, *Osmundea pinnatifida* and *Lomentaria articulata* (Fser.R). The sublittoral fringe is dominated by kelp *Laminaria digitata* with a similar turf of red algae on rock and *Palmaria palmata* on kelp stipes (Ldig.Ldig).

A large sand-floored pool in Pool Bay is bound on the seaward side by a boulder sill. There is a rich cover of scour-tolerant algae including *Halidrys siliquosa*, *Polyides rotundus*, *Ahnfeltia plicata* and *Chylocladia verticillata*, with lugworms *Arenicola marina* in the sediment (SwSed).

Sublittoral

Wave-exposed bedrock at the northern end of Eday Sound supports a dense *Laminaria hyperborea* kelp forest with an understorey rich in red algae (LhypR.Ft). Large boulders in the infralittoral are dominated by a dense canopy of *Saccorhiza polyschides* (LsacSac) a fast-growing, opportunistic kelp species suggesting a degree of mobility of the substrata, probably turned over during winter storms. Caves extend into the shallow sublittoral; their ceilings are exposed to the air. Bedrock and boulders at cave entrances have a dense turf of foliose algae, predominantly *Dictyota dichotoma*, *Plocamium cartilagineum* and *Dilsea carnosa*, often with a high abundance of the green alga *Chaetomorpha melagonium* (FoSwCC). Cave walls are wave-surfed and support an ascidian/sponge biotope of *Dendrodoa grossularia* and *Clathrina coriacea* (SCAs.DenCla). Towards the back of the cave, the biotope changes to a sponge-dominated one (SC).

Moving southwards into the sound, bedrock and boulders in the infralittoral support a tide-swept kelp forest with red algae (Lhyp.TFt, Lhyp.TPk). Although species diversity in the infralittoral is similar to that in other areas of Orkney, the abundance of organisms is much higher in Eday Sound, probably due to the apparent absence of grazing pressure by the sea urchin *Echinus esculentus* which occurs

elsewhere, particularly Scapa Flow. Kelp forests of *L. hyperborea* have a dense turf of red algae on the rock beneath, typically dominated by *Delesseria sanguinea*, *P. cartilagineum* and *Odonthalia dentata*. The kelp stipes are heavily epiphytised by red algae showing stipe zonation with *Callophyllis laciniata* and *Cryptopleura ramosa* covering the lower parts and *P. cartilagineum* and *Ptilota gunneri* towards the frond. In some areas the epiphytes are almost completely covered by the bryozoans *Alcyonidium diaphanum* and *Electra pilosa*, in others they are covered by the colonial ascidians *Botryllus schlosseri* and *Botrylloides leachi*. Some stipes have an almost total covering of a massive, bright yellow form of breadcrumb sponge *Halichondria panicea* with few red algae attached. Numerous hydroid species occur in the upper infralittoral, including *Nemertesia* spp. and *Sertularia* spp., the latter occurring at high abundance in some areas. Such a diversity of hydroids has not been recorded in Orkney except around Sanday (see also *area summary 10*).

In Lashy Sound the tidal streams are particularly strong and species richness is reduced, probably due to tidal scour. At this site, a dense kelp forest of large *Laminaria digitata*, a species usually restricted to the sublittoral fringe, occurs to depths of 20 m (Lhyp.TFt). The occurrence of this species at this depth is a rare phenomenon; it is thought that it is able to out-compete *L. hyperborea* due to the turbulent conditions created by the tidal race.

The centre of Spurness Sound comprises a gently-sloping or level sea bed of small boulders, cobbles and sand subject to moderate tidal streams and supporting a kelp park (Lhyp.TPk). Tidal streams in the deeper central parts of Eday Sound are reduced and the substratum comprises small boulders and cobbles which are stable and support a kelp park of fairly small *L. hyperborea* plants (Lhyp.Pk). On Eday Gruna the kelp forest is characterised by a mixture of *L. hyperborea* and *S. polyschides* with *Alaria esculenta* (XKScrR). The boulders and cobbles have a less-dense turf of red algae compared to bedrock areas, probably due to sand-scour; the rock is encrusted with the keel worm *Pomatoceros triqueter* and coralline algal crusts. The kelp stipes are covered with a similar fauna and flora as the less sand-scoured areas.

Lower infralittoral and upper circalittoral biotopes occur in deeper areas in the centre of Eday Sound, west of Spur Ness. In these areas, cobbles and pebbles support a sparse cover of hydroids, with dahlia anemones *Urticina felina* and bivalves *Circomphalus casina* and *Glycymeris glycymeris* occurring amongst the mixed substrata. In shallower water, sparse, small *L. hyperborea* plants and red algae are attached to the larger cobbles (Lhyp.Pk); in deeper parts encrusting algae cover the cobbles and the density of hydroids increases, with *Abietinaria abietina* dominating (FaAIC.Abi).

No dense horse mussel *Modiolus modiolus* beds have been found in Area 9, but at the entrance to Spurness Sound, a deeper hole provides a 'sink' for a great number of empty *Modiolus* shells brought and deposited by the tide, suggesting the existence of dense mussel beds elsewhere in Eday Sound. This 'sink' may, however, be evidence of a historically greater abundance of *Modiolus* than survives today in the Area; similar aggregations of *Modiolus* shells occur in North Ronaldsay Firth (*area summary 10*).

In the southern reaches of Eday Sound, south of Eday and Linga Holm, the substratum comprises beds of live and dead maerl *Phymatolithon calcareum* (Phy.R). Associated with the maerl beds are sparse kelps *Laminaria saccharina* and *L. hyperborea* and scour-tolerant algae such as *Furcellaria lumbricalis* and *Trailliella intricata*. Infauna include bivalves, especially *Ensis* sp., and the fanworms *Sabella pavonina* and *Chone* sp. At the eastern side of Bay of Greentoft, the maerl bed is associated with common *M. modiolus* (Phy.R).

Sublittoral sediments in the area are restricted to pockets of coarse sand between mixed substrata, and to sheltered areas in Bay of London and St Catherine's Bay. The Bay of London comprises infralittoral fine sand at 4 m with *Arenicola marina* (FaS). St Catherine's Bay is shallow and sheltered by Linga Holm and the Swarf and comprises empty shells and sandy shell-gravel with a canopy of cape form *L. saccharina*, *Chorda filum* and a number of bleached, filamentous red algae, a community typical of sheltered, shallow conditions in Orkney in summer. The shell-sand contains dense polychaete tubes (LsacX).

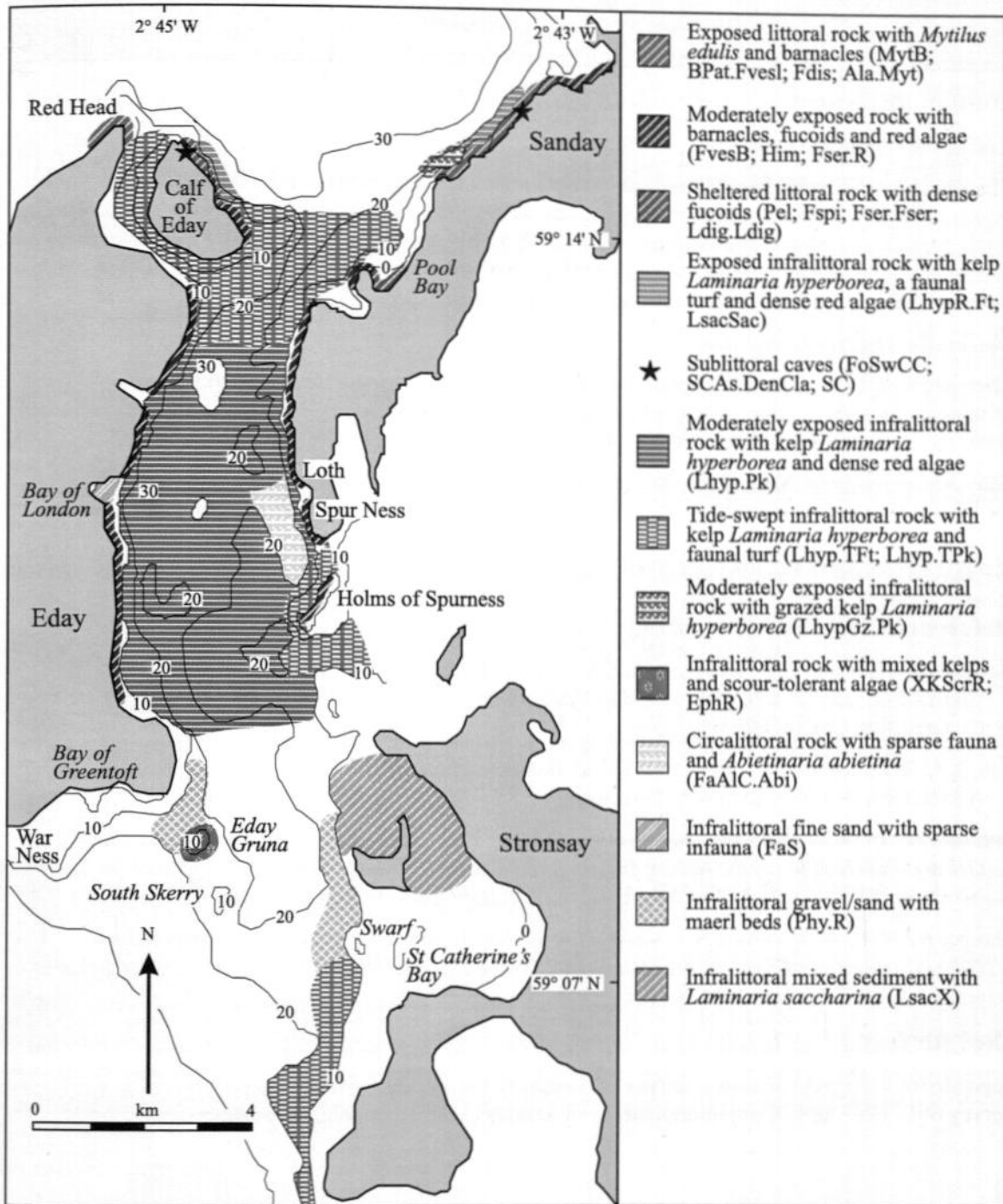


Figure 9.2 Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 9.1, cited literature and additional field observations).

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Nature conservation

Conservation sites		
Site name	Status	Main features
Calf of Eday	SPA; SSSI	Ornithological

Human influences

Coastal developments and uses

The islands surrounding Eday Sound are sparsely populated, the main land-use being livestock grazing. There are houses and farmland adjacent to the coast; domestic sewage is mainly deposited in septic tanks which may seep onto the shore, although no signs of enrichment or sewage were observed in the area. The coastline is generally undeveloped, with the exception of a harbour and Orkney Ferries Ro-Ro slip at Loth on Sanday and Backaland on Eday.

Marine developments and uses

There are a number of small fish cages on the east coast of Eday to the north of Backaland, used for salmon *Salmo salar* rearing. The cages are situated in an area of moderate tidal streams with adequate water movement under the cages which prevents any visible adverse effects.

Eday Sound has been dredged for scallops in the past; presently the main fishing activities are potting for lobster *Homarus gammarus*, edible crab *Cancer pagurus* and velvet crab *Necora puber*. Several small boats fish from Loth. Some collection of shellfish by divers occurs, predominantly taking scallops *Pecten maximus* and *Aequipecten opercularis* and razor clams *Ensis* spp.

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Sites surveyed

- Survey 680: 1997 MNCR littoral survey of Sanday (MNCR, unpublished data).
- Survey 681: 1997 MNCR sublittoral survey of Sanday (MNCR, unpublished data).

Littoral sites					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
680	2	S Bay of Brough, Eday Sound.	HY 653 415	59°15.5'N 02°36.5'W	Ver.Ver; Pel; Fspi; FvesB; FK; Fser.Fser
680	4	S of Blue Geo, Eday Sound.	HY 638 407	59°15.1'N 02°38.0'W	YG; Ver.Ver; Ver.Por; BPat.Lic; MytB; Cor; Ala.Myt
680	5	Blue Geo, Eday Sound.	HY 638 408	59°15.1'N 02°38.0'W	Ver.Ver; Pel; Fdis; BPat.Fvesl; Him
680	6	Lamba Ness, Eday Sound.	HY 614 381	59°13.6'N 02°40.5'W	Chr; Fspi; FvesB; Fser.Fser.Bo; Ldig.Ldig
680	7	Pool Bay, SW Sanday, Eday Sound.	HY 618 379	59°13.5'N 02°40.1'W	SwSed; Asc.Asc
680	15	Hegglie Ber, Eday Sound.	HY 603 372	59°13.2'N 02°41.7'W	Fspi; Asc.Asc; Fser.R; Ldig.Ldig
680	16	S of Loth, Eday Sound.	HY 603 339	59°11.4'N 02°41.6'W	YG; Pel; Fspi; Asc.Asc; Fser.R; Ldig.Ldig
680	25	Holms of Spurness, Eday Sound.	HY 603 320	59°10.4'N 02°41.6'W	YG; Pel; FvesB; Fser.R; Ldig.Ldig
680	26	Quera Geos, Calf of Eday, Eday Sound.	HY 588 391	59°14.2'N 02°43.3'W	Chr; Ent; Fdis; MytB; Fser.R; Him; Ldig.Ldig

Sublittoral sites					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
681	1	Off Millgrip, SW Stronsay, Eday Sound.	HY 601 229	59°05.4'N 02°41.7'W	Lhyp.TFt
681	2	SW Linga Holm, Eday Sound.	HY 609 268	59°07.6'N 02°40.8'W	Phy.R
681	3	St Catherine's Bay, Stronsay, Eday Sound.	HY 625 278	59°08.1'N 02°39.2'W	LsacX
681	5	Lashy Sound, Eday Sound.	HY 599 374	59°13.3'N 02°42.1'W	Lhyp.TFt
681	6	Mid Eday Sound.	HY 590 340	59°11.4'N 02°43.0'W	Lhyp.Pk
681	7	Greeny Brae, Eday Sound.	HY 582 368	59°12.9'N 02°43.8'W	Lhyp.TFt
681	8	Bay of London, Eday Sound.	HY 566 341	59°11.5'N 02°45.5'W	FaS
681	9	E Bay of Greentoft, Eday Sound.	HY 578 283	59°08.4'N 02°44.2'W	Lhyp.TFt; ModT; Phy.R
681	10	Eday Gruna, Eday Sound.	HY 584 280	59°08.2'N 02°43.5'W	XKScrR
681	11	N Calf Sound, Calf of Eday, Eday Sound.	HY 569 394	59°14.3'N 02°45.2'W	Lhyp.TFt
681	12	Calf Sound, Eday Sound.	HY 580 379	59°13.5'N 02°44.1'W	Lhyp.TFt
681	13	W of Spur Ness, Eday Sound.	HY 598 329	59°10.8'N 02°42.1'W	FaAlC.Abi
681	14	Spurness Sound, Eday Sound.	HY 602 311	59°09.9'N 02°41.7'W	Lhyp.TPk
681	26	Off Scuthi Head, Eday Sound.	HY 629 402	59°14.8'N 02°39.0'W	LhypGz.Pk; EphR; AlcByH
681	27	Caves, Grey Head, Eday Sound.	HY 579 402	59°14.8'N 02°44.1'W	LhypR.Ft; FoSwCC; SCAs.DenCla; SC
681	28	NE Scuthi Head, Eday Sound.	HY 637 408	59°15.1'N 02°38.1'W	LhypR.Ft; LsacSac; SCAs.DenCla; SC; XKScrR

Compiled by: Eleanor Murray

Location

Position (centre)	HY 70 46	59°18'N 02°31'W
Administrative area	Orkney Islands	
Conservation agency/area	Scottish Natural Heritage	Northern Isles

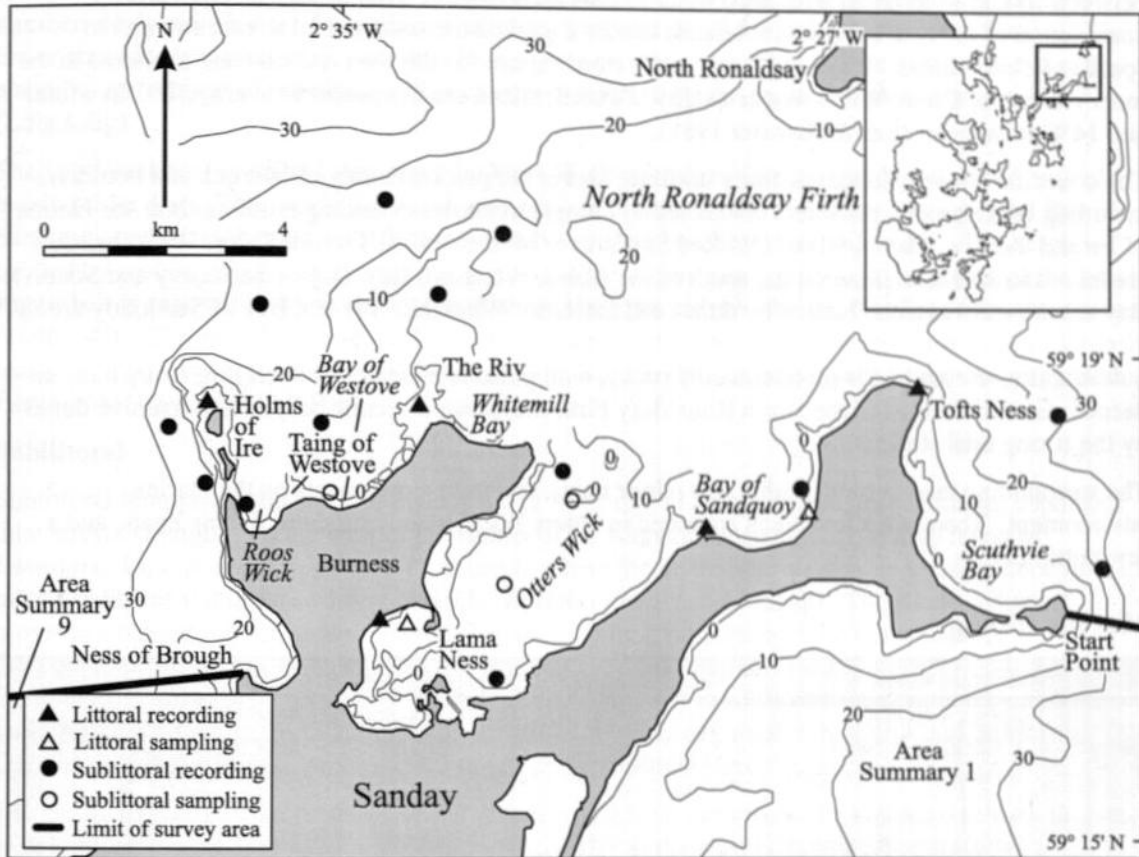


Figure 10.1 Main features of the area, showing sites surveyed.

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Physical features

Physiographic type	Linear coast with embayment
Length of coast	47 km
Bathymetry	The north coast is dominated by the large embayment of Otters Wick, which is 11 m at its deepest. North Ronaldsay Firth to the north of Sanday is predominantly less than 20 m in depth. To the west the sea bed shelves steeply to depths exceeding 40 m, with the 30 m contour occurring within 1 km of the coast.
Wave exposure	Exposed to west of Sanday; sheltered in Otters Wick.
Tidal streams	Generally weak throughout the area, although there is a strong tidal race at the east of North Ronaldsay Firth.
Tidal range	3.5 m (mean springs); 1.6 m (mean neaps)
Salinity	Fully marine; may be variable in Otters Wick

Introduction

Sanday is a large island in the north-east of the Orkney archipelago. It is a low-lying island with the highest point being 65 m above sea level. The north-western part of the island is rocky with relatively steep landward and offshore gradients, the north-eastern part is generally of blown sand deposits, characterised by dune systems and machair. The coastline of north Sanday is dominated by the large, shallow fjardic inlet of Otters Wick, which is sheltered from wave action and provides anchorage for boats. Otters Wick is 500 ha in area, but its depth rarely exceeds 10 m; there is a large extent of intertidal sediment in the inner basin west of Lama Ness. To the north of Sanday lies the island of North Ronaldsay, which is separated from Sanday by the North Ronaldsay Firth, a bar of rock between 10 and 15 m depth with deep water to the east and west. This change in depth and constriction of the firth between the islands causes a marked increase in tidal stream strength to speeds of over 4 knots. Wave exposure varies from exposed to the west and east and sheltered in the inner reaches of Otters Wick. Water quality is excellent and sea temperatures average 7°C in winter and 14°C in summer (Lee & Ramster 1981).

The coastline of north Sanday is fairly uniform; shores are predominantly of bedrock and boulders, including broken rocky platforms connected by shingle tombolos extending northwards at the Holms of Ire and the Riv. Geology is of Old Red Sandstone (Mykura 1975). Outside Otters Wick, beaches are less extensive than those on the south of the island; Whitemill Bay, Bay of Sandquoy and Scuthvie Bay are the main extents, backed by dunes and machair. Whitemill Bay and Bay of Sandquoy are afforded shelter by the shallow sea bed offshore, and are of fine sand (Mather, Smith & Ritchie 1974). Sublittorally, the sea bed is predominantly rocky, with pockets of sediment overlying rocky reef. In deeper water to the east of the North Ronaldsay Firth coarse sand occurs, heaped into massive dunes by the strong tidal streams.

The surrounding land is rural, with a few minor roads, and no major impacts on the marine environment. There are a few boats anchored in Otters Wick, mainly offshore fishing boats, and a few potting boats.

Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
Littoral	Recording (epibiota)	5	June-July 1997	MNCR survey 680
	Infaunal sampling (cores)	2	June-July 1997	MNCR survey 680
Sublittoral	Recording (epibiota)	14	June-July 1997	MNCR survey 681
	Infaunal sampling (cores)	3	June-July 1997	MNCR survey 681

Littoral

Throughout Area 10, the shore backing is of dune or machair with little or no bedrock in the splash zone, thus there are only small extents of supralittoral lichens, if any.

The north-west of Sanday is dominated by two large rocky promontories, the Holms of Ire and the Riv. These are broken areas of bedrock connected by shingle tombolos extending 2 km northwards from Burness, with a sand and shingle beach between. Bedrock areas are level and the littoral extent affords shelter for upper shore furoid biotopes with *Pelvetia canaliculata* (Pel) and *Fucus spiralis* (Fspi). The mid- and lower eulittoral are subject to wave wash and are characterised by *Fucus vesiculosus* and barnacle mosaics (FvesB) and *Himantalia elongata* (Him) respectively. The shingle banks span the mid and lower eulittoral and are fairly impoverished, with a dense cover of furoid algae *F. vesiculosus* (FvesX) and *Fucus serratus* (Fser.Fser.Bo).

Bedrock platforms in Otters Wick have scattered cobbles and pebbles in patches and are sheltered from wave action. Communities are characterised by furoid algae, with *P. canaliculata* (Pel) and *F. spiralis* (Fspi) on the upper shore. Mid and lower eulittoral habitats have a dense cover of *F. vesiculosus* and *Ascophyllum nodosum* (Fves, Asc.Asc) and *F. serratus* (Fser.Fser). The whole

shore is heavily silted and the sublittoral fringe is generally of sand and cobbles. Species richness on these shores is fairly low due to the low energy and silted nature of the area.

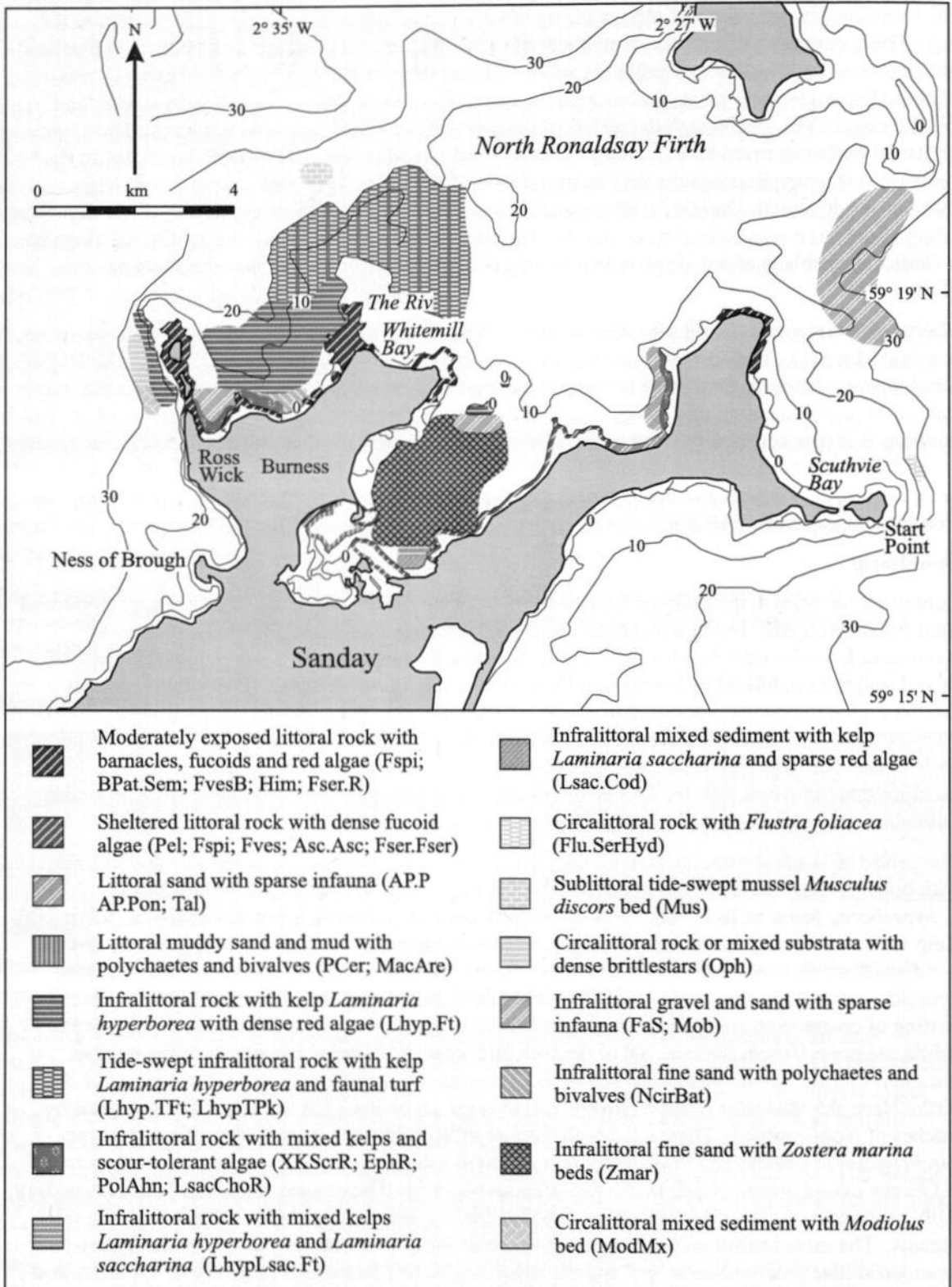
The geology of the shores around Tofts Ness differs from the rest of the north coast, with folding of the rocks creating an intertidal zone made up of very rugged outcrops running perpendicular to the sea. These outcrops increase the complexity of the biological composition, with pockets of localised shelter occurring throughout a generally wave-exposed shore enabling a mixture of exposed and sheltered biotopes to co-exist. Bedrock on the upper shore has a dense cover of yellow, grey and black lichens (YG, Ver.Ver) with patches of the green alga *Prasiola stipitata* in places. The upper eulittoral is characterised by *F. spiralis* in the leeward side of outcrops (Fspi) and barnacles on the seaward side, extending into the mid-eulittoral (BPat.Sem). This zone also supports very large numbers of dogwhelk *Nucella lapillus* which was rarely recorded throughout the rest of Sanday. The lower shore has a mosaic of *F. serratus*, *H. elongata* and red algae (Fser.R); the sublittoral fringe has a similar assemblage of red algae, with a canopy dominated by the kelp *Laminaria digitata* (Ldig.Ldig).

Sheltered sediment south of Lama Ness in Otters Wick comprises fine sand and mud with *Arenicola marina* (MacAre). The cockle *Cerastoderma edule* is present on the mid-shore. (PCer). The Bay of Sandquoy on the north-west coast is representative of sand beaches on north Sanday. The beach is backed by mobile cobbles and comprises a gentle slope of fine sand. Although the aspect of the beach suggests it is exposed to wave action, the offshore shallows provide shelter, thus the sediment appears more stable. The strandline is of cobbles and soft sand with some talitrid amphipods amongst the drift seaweed (Tal). The mid- and lower shores are characterised by the amphipods *Bathyporeia* spp. and *Pontocrates arenarius* (AP.Pon).

Sublittoral

Sublittoral biotopes to the north of Sanday are diverse, due to the variations in substratum, depth and tidal stream strength. To the west of the Holms of Ire bedrock supports a dense kelp forest of *Laminaria hyperborea* (Lhyp.Ft) to 17 m depth, where the bedrock gives way to a gentle slope of mixed sediment stabilised by horse mussels *Modiolus modiolus* (ModMx). The stable sediment provides a habitat for numerous infaunal species, including bivalves and the sea cucumber *Neopentadactyla mixta*; the sediment is carpeted by foliose algae, particularly the brown alga *Dictyota dichotoma*. Further offshore, the *Modiolus* biotope gives way to mixed sediment bound by a reef-building sabellid worm, and the lush algal growth diminishes; a carpet of hydroids and brittlestars *Ophiothrix fragilis* and *Ophiocomina nigra* cover the substrata (Oph).

The centre of North Ronaldsay Firth is subject to strong tidal streams, and comprises bedrock ridges with boulders and cobbles. Tide-swept infralittoral rock in the west of the Firth supports *L. hyperborea* forest at 16 m depth with an understorey rich in foliose algae and hydroids (Lhyp.TFt). Kelp stipes are heavily encrusted with algae, the breadcrumb sponge *Halichondria panicea* and the ascidians *Botryllus schlosseri* and *Botrylloides leachi*. Short vertical faces have a dense carpet of hydroids, particularly *Sertularia cupressina* and *Eudendrium capillare*. The rock surfaces have a dusting of coarse sand and areas at the base of vertical faces are scoured and barren except for the dahlia anemone *Urticina felina*. All of the rock and algae are covered in a carpet of the bivalve, *Musculus discors*, the dominance of which increases into the circalittoral at the western end of the Firth. Here, the *Musculus* forms a continuous coverage on bedrock (Mus), which is interrupted by patches of mobile gravel. There are a high number of hydroid species including *Nemertesia* spp., *Kirchenpaueria pinnata* and *Plumularia setacea*; such a diversity of hydroids has not been recorded in Orkney except around Sanday (see also *area summary* 9). The eastern end of the North Ronaldsay Firth, to the east of Start Point comprises deep boulders, cobbles and pebbles subject to strong tidal streams. The mixed substrata support robust hydroids and bryozoans, dominated by the hydroids *Abietinaria abietina*, *Sertularia* spp. and the bryozoan *Flustra foliacea* (Flu.SerHyd). Of interest at this site was a large amount of empty *Modiolus* shells between the boulders, possibly 'dumped' by strong tidal streams; similar aggregations of *Modiolus* shells occur in Eday Sound (*area summary* 9).



< **Figure 10.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 10.1, cited literature and additional field observations).

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Further inshore, infralittoral communities comprise bedrock ridges with tide-swept kelp and dense foliose red algae (Lhyp.TFt). Short vertical faces support dead-man's fingers *Alcyonium digitatum*, sponges and the calcareous tubicolous polychaete *Salmacina dysteri*. Gullies at the base of the short vertical faces are filled with cobbles which appear seasonally mobile, supporting a variety of ephemeral red algae, especially *Scinaia trigona* and *Halarachnion ligulatum* (EphR). The brown alga *Desmarestia dresnayi*, not previously recorded north of Skye, occurs in this habitat (Hiscock & Covey 1991; S. Scott, pers. comm.).

Infralittoral habitats between the Holms of Ire and the Riv and in Otters Wick are fairly sheltered from wave action and tidal streams by shallow reefs. In these areas dense *L. hyperborea* forest has an understorey rich in algae, due to no apparent grazing pressure from the urchin *Echinus esculentus* (Lhyp.Ft). The understorey and stipes are encrusted with *Plocamium cartilagineum*, *Dilsea carnosa* and *Heterosiphonia plumosa*, with *Phyllophora pseudoceranoides* and *Trailliella intricata* in areas adjacent to sand and gravel patches.

Shallow substrata in Roos Wick comprise bedrock and boulders which appear relatively mobile. Dominant algae are *L. hyperborea* and *Saccorhiza polyschides* with the green alga *Ulva* sp. in the understorey; the last two are fast-growing algae indicative of seasonal mobility of substrata (XKScrR). Dense *Ulva* sp. is also recorded to the east of Taing of Westove where it colonises boulders and is interspersed with bootlace weed *Chorda filum* (LsacChoR); this biotope also occurs in the eastern part of Bay of Westove.

Sublittoral sediment is restricted to shallow, sheltered areas north of Burness and in Otters Wick, with the exception of large dunes of coarse sand with no apparent infauna at 30 m bcd at the eastern end of the North Ronaldsay Firth (Mob). Shallow fine sand in the centre of Otters Wick, and adjacent to the open coast beaches, supports *Arenicola marina* and *Ensis arcuatus* and is rich in polychaetes and amphipods (FaS). The southern, most sheltered part of Otters Wick comprises fine sand at less than 5 m depth with dense patches of eelgrass *Zostera marina* (Zmar). Adjacent to the pier in Otters Wick mixed sediments are characterised by a forest of the green alga *Codium* sp. and sparse *Laminaria saccharina* (Lsac.Cod).

Nature conservation

Conservation sites		
Site name	Status	Main features
Sanday	cSAC	Common seals <i>Phoca vitulina</i>
East Sanday Coast	SPA; Ramsar; SSSI;	Ornithological; botanical; common seals <i>Phoca vitulina</i>
Northwall	SSSI	Botanical (machair; wetland)

Human influences

Coastal developments and uses

The north coast of Sanday is predominantly rural, with a few minor roads and houses adjacent to the coastline. In places the coastline is protected by coastal defences, and has suffered fly-tipping.

Marine developments and uses

A few offshore fishing boats anchor in Otters Wick, and a few potting boats, although potting for crabs and lobsters *Homarus gammarus* is generally restricted to the outer reaches of Otters Wick due to the strong tidal streams in North Ronaldsay Firth. There is small-scale tray culture of manila clams *Tapes philippinarum* and low intensity collection of cockles *Cerastoderma edule* (Buck 1993).

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- Thorpe, K. 1998. *Marine Nature Conservation Review Sectors 1 & 2. Lagoons in Shetland and Orkney: area summaries*. Peterborough, Joint Nature Conservation Committee. (Coasts and seas of the United Kingdom. MNCR series.)

Sites surveyed

Survey 680: 1997 MNCR littoral survey of Sanday (MNCR, unpublished data).

Survey 681: 1997 MNCR sublittoral survey of Sanday (MNCR, unpublished data).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
680	1	Ebb of the Riv, North Sanday.	HY 682 469	59°18.4'N 02°33.5'W	Fspi; Ent; FvesX; BPat.Sem; FK; Fser.Fser.Bo
680	3	N of Landward Geo, Holms of Ire, North Sanday.	HY 648 470	59°18.5'N 02°37.1'W	Pra; Ver.Por; Pel; FvesB; FK; Him
680	12	Taing of Tor Sker, Otters Wick, North Sanday.	HY 729 450	59°17.4'N 02°28.5'W	Fspi; Asc.Asc; Fser.Fser; Lsac.Ldig
680	14	Tofts Ness, North Sanday.	HY 763 473	59°18.7'N 02°24.9'W	YG; Ver.Ver; Fspi; BPat.Sem; Fser.R; Ldig.Ldig
680	19	S of Skelbrae, Otters Wick, North Sanday.	HY 676 436	59°16.6'N 02°34.1'W	YG; Pel; Fspi; Fves; Fser.Fser
680	20	W of Lama Ness, Otters Wick (Bay), North Sanday.	HY 680 435	59°16.6'N 02°33.6'W	AP.P; MacArc; PCer
680	24	Bay of Sandquoy, North Sanday.	HY 746 452	59°17.5'N 02°26.7'W	AP.Pon; Tal

Sublittoral sites					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
681	18	Tide-races, N of Tofts Ness, North Sanday.	HY 656 484	59°19.3'N 02°36.2'W	Lhyp.TFt
681	25	Whale Point, North Sanday.	HY 647 455	59°17.7'N 02°37.1'W	Lhyp.Ft; ModMx
681	29	N of Whitemill Skerry, North Sanday.	HY 695 496	59°19.9'N 02°32.0'W	Lhyp.TFt
681	30	E of the Lotheran, North Sanday.	HY 666 466	59°18.3'N 02°35.2'W	Lhyp.Ft
681	31	Offshore Burnes, North Sanday.	HY 685 487	59°19.4'N 02°33.2'W	Lhyp.TPk; EphR
681	32	E of Taing of Westove, Burness, North Sanday.	HY 667 454	59°17.6'N 02°34.9'W	LsacChoR; NcirBat
681	33	W Holms of Ire, North Sanday.	HY 641 465	59°18.2'N 02°37.7'W	Oph
681	34	W Kirk Taing, North Sanday.	HY 694 425	59°16.1'N 02°32.1'W	LhypLsac.Ft; Lsac.Cod
681	35	Offshore Bea of Trevan, North Sanday.	HY 675 500	59°20.1'N 02°34.1'W	Mus
681	36	W outer Skerry, Otters Wick, North Sanday.	HY 705 458	59°17.9'N 02°30.9'W	Lhyp.Ft
681	37	E North Ronaldsay Firth, North Sanday.	HY 786 468	59°18.4'N 02°22.5'W	Mob
681	38	W Otters Wick, North Sanday.	HY 696 439	59°16.8'N 02°32.0'W	Zmar
681	39	E of Start Point, North Sanday.	HY 793 442	59°17.0'N 02°21.7'W	Flu.SerHyd
681	40	SW of the Skerry, Otters Wick, North Sanday.	HY 706 454	59°17.6'N 02°30.9'W	FaS
681	44	E Bay of Sandquoy, North Sanday.	HY 744 456	59°17.7'N 02°26.9'W	FaS; Lhyp.Ft; LsacChoR
681	45	Roos Wick, North Sanday.	HY 654 453	59°17.5'N 02°36.4'W	XKScrR

Compiled by: Eleanor Murray

Appendix A

Biotopes classification

A hierarchical classification of the biotopes recorded in MNCR Sector 2 (Orkney) during the surveys given in Table 1, together with their higher types, is given below. The biotopes listed are derived from the MNCR national biotope classification version 97.06 (Connor *et al.* 1997a, b). Records of biotopes noted in the text but not shown here come from additional published sources cited in the individual area summaries. Species nomenclature follows Howson & Picton (1997).

Higher code	Biotope code	Biotope
LR		LITTORAL ROCK (and other hard substrata)
LR.L		Lichens or algal crusts
LR.L	YG	Yellow and grey lichens on supralittoral rock
LR.L	Pra	<i>Prasiola stipitata</i> on nitrate-enriched supralittoral or littoral fringe rock
LR.L	Ver	<i>Verrucaria maura</i> on littoral fringe rock
LR.L	Ver.Por	<i>Verrucaria maura</i> and <i>Porphyra umbilicalis</i> on very exposed littoral fringe rock
LR.L	Ver.B	<i>Verrucaria maura</i> and sparse barnacles on exposed littoral fringe rock
LR.L	Ver.Ver	<i>Verrucaria maura</i> on moderately exposed to very sheltered upper littoral fringe rock
LR.L	Chr	Chrysophyceae on vertical upper littoral fringe soft rock
ELR		Exposed littoral rock (mussel/barnacle shores)
ELR.MB		<i>Mytilus</i> (mussels) and barnacles
ELR.MB	MytB	<i>Mytilus edulis</i> and barnacles on very exposed eulittoral rock
ELR.MB	BPat	Barnacles and <i>Patella</i> spp. on exposed or moderately exposed, or vertical sheltered, eulittoral rock
ELR.MB	BPat.Cht	<i>Chthamalus</i> spp. on exposed upper eulittoral rock
ELR.MB	BPat.Lic	Barnacles and <i>Lichina pygmaea</i> on steep exposed upper eulittoral rock
ELR.MB	BPat.Fvesl	Barnacles, <i>Patella</i> spp. and <i>Fucus vesiculosus</i> f. <i>linearis</i> on exposed eulittoral rock
ELR.MB	BPat.Sem	<i>Semibalanus balanoides</i> on exposed or moderately exposed, or vertical sheltered, eulittoral rock
ELR.FR		Robust fucoids or red seaweeds
ELR.FR	Fdis	<i>Fucus distichus</i> subsp. <i>anceps</i> and <i>Fucus spiralis</i> f. <i>nana</i> on extremely exposed upper eulittoral rock
ELR.FR	Coff	<i>Corallina officinalis</i> on very exposed lower eulittoral rock
ELR.FR	Him	<i>Himanthalia elongata</i> and red seaweeds on exposed lower eulittoral rock

Higher code	Biotope code	Biotope
MLR		Moderately exposed littoral rock (barnacle/fucoid shores)
MLR.BF		Barnacles and fucoids (moderately exposed shores)
MLR.BF	FvesB	<i>Fucus vesiculosus</i> and barnacle mosaics on moderately exposed mid-eulittoral rock
MLR.BF	Fser	<i>Fucus serratus</i> on moderately exposed lower eulittoral rock
MLR.BF	Fser.R	<i>Fucus serratus</i> and red seaweeds on moderately exposed lower eulittoral rock
MLR.BF	Fser.Fser	Dense <i>Fucus serratus</i> on moderately exposed to very sheltered lower eulittoral rock
MLR.BF	Fser.Fser.Bo	<i>Fucus serratus</i> and under-boulder fauna on lower eulittoral boulders
MLR.R		Red seaweeds (moderately exposed shores)
MLR.R	XR	Mixed red seaweeds on moderately exposed lower eulittoral rock
MLR.R	Mas	<i>Mastocarpus stellatus</i> and <i>Chondrus crispus</i> on very to moderately exposed lower eulittoral rock
MLR.Eph		Ephemeral green or red seaweeds (freshwater or sand-influenced)
MLR.Eph	Ent	<i>Enteromorpha</i> spp. on freshwater-influenced or unstable upper eulittoral rock
MLR.Eph	Rho	<i>Rhodothamniella floridula</i> on sand-scoured lower eulittoral rock
SLR		Sheltered littoral rock (fucoid shores)
SLR.F		Dense fucoids (stable rock)
SLR.F	Pel	<i>Pelvetia canaliculata</i> on sheltered littoral fringe rock
SLR.F	Fspi	<i>Fucus spiralis</i> on moderately exposed to very sheltered upper eulittoral rock
SLR.F	Fves	<i>Fucus vesiculosus</i> on sheltered mid-eulittoral rock
SLR.F	Asc	<i>Ascophyllum nodosum</i> on very sheltered mid-eulittoral rock
SLR.F	Asc.Asc	<i>Ascophyllum nodosum</i> on full salinity mid-eulittoral rock
SLR.F	Asc.T	<i>Ascophyllum nodosum</i> , sponges and ascidians on tide-swept mid-eulittoral rock
SLR.F	Fserr	<i>Fucus serratus</i> on sheltered lower eulittoral rock
SLR.F	Fserr.T	<i>Fucus serratus</i> , sponges and ascidians on tide-swept lower eulittoral rock
SLR.FX		Fucoids, barnacles or ephemeral seaweeds (mixed substrata)
SLR.FX	FvesX	<i>Fucus vesiculosus</i> on mid-eulittoral mixed substrata
SLR.FX	AscX	<i>Ascophyllum nodosum</i> on mid-eulittoral mixed substrata
SLR.FX	FserX	<i>Fucus serratus</i> on lower eulittoral mixed substrata

Higher code	Biotope code	Biotope
SLR.FX	FserX.T	<i>Fucus serratus</i> with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata
SLR.FX	EphX	Ephemeral green and red seaweeds on variable salinity or disturbed eulittoral mixed substrata
Littoral rock (other)		
LR.Rkp		Rockpools
LR.Rkp	G	Green seaweeds (<i>Enteromorpha</i> spp. and <i>Cladophora</i> spp.) in upper shore rockpools
LR.Rkp	Cor	<i>Corallina officinalis</i> and coralline crusts in shallow eulittoral rockpools
LR.Rkp	FK	Fucoids and kelps in deep eulittoral rockpools
LR.Rkp	SwSed	Seaweeds in sediment (sand or gravel)-floored eulittoral rockpools
LS		LITTORAL SEDIMENTS
LGS		Littoral gravels and sands
LGS.S		Sand shores
LGS.S	Tal	Talitrid amphipods in decomposing seaweed on the strand-line
LGS.S	BarSnd	Barren coarse sand shores
LGS.S	AEur	Burrowing amphipods and <i>Eurydice pulchra</i> in well-drained clean sand shores
LGS.S	AP	Burrowing amphipods and polychaetes in clean sand shores
LGS.S	AP.P	Burrowing amphipods and polychaetes (often with <i>Arenicola marina</i>) in clean sand shores
LGS.S	AP.Pon	Burrowing amphipods <i>Pontocrates</i> spp. and <i>Bathyporeia</i> spp. in lower shore clean sand
LGS.Est		Estuarine coarse sediment shores
LGS.Est	OI	Oligochaetes in reduced or low salinity gravel or coarse sand shores
LMS		Littoral muddy sands
LMS.MS		Muddy sand shores
LMS.MS	PCer	Polychaetes and <i>Cerastoderma edule</i> in fine sand and muddy sand shores
LMS.MS	MacAre	<i>Macoma balthica</i> and <i>Arenicola marina</i> in muddy sand shores
LMU		Littoral muds
LMU.SMu		Sandy mud shores
LMU.SMu	HedMac	<i>Hediste diversicolor</i> and <i>Macoma balthica</i> in sandy mud shores

Higher code	Biotope code	Biotope
LMU.SMu	HedMac.Are	<i>Hediste diversicolor</i> , <i>Macoma balthica</i> and <i>Arenicola marina</i> in muddy sand or sandy mud shores
LMU.Mu		Soft mud shores
LMU.Mu	HedOl	<i>Hediste diversicolor</i> and oligochaetes in low salinity mud shores
IR		INFRA-LITTORAL ROCK (and other hard substrata)
EIR		Exposed infralittoral rock
EIR.KFaR		Kelp with cushion fauna, foliose red seaweeds or coralline crusts (exposed rock)
EIR.KFaR	Ala	<i>Alaria esculenta</i> on sublittoral fringe bedrock
EIR.KFaR	Ala.Myt	<i>Alaria esculenta</i> , <i>Mytilus edulis</i> and coralline crusts on very exposed sublittoral fringe bedrock
EIR.KFaR	Ala.Ldig	<i>Alaria esculenta</i> and <i>Laminaria digitata</i> on exposed sublittoral fringe bedrock
EIR.KFaR	LhypFa	<i>Laminaria hyperborea</i> forest with a faunal cushion (sponges and polyclinids) and foliose red seaweeds on very exposed infralittoral rock
EIR.KFaR	LhypR	<i>Laminaria hyperborea</i> with dense foliose red seaweeds on exposed infralittoral rock
EIR.KFaR	LhypR.Ft	<i>Laminaria hyperborea</i> forest with dense foliose red seaweeds on exposed upper infralittoral rock
EIR.KFaR	LhypR.Pk	<i>Laminaria hyperborea</i> park with dense foliose red seaweeds on exposed lower infralittoral rock
EIR.KFaR	LsacSac	<i>Laminaria saccharina</i> and/or <i>Saccorhiza polyschides</i> on exposed infralittoral rock
EIR.KFaR	FoR	Foliose red seaweeds on exposed or moderately exposed lower infralittoral rock
EIR.SG		Robust faunal cushions and crusts (surge gullies & caves)
EIR.SG	FoSwCC	Foliose seaweeds and coralline crusts in surge gully entrances
EIR.SG	SCAs	Sponge crusts and colonial ascidians on wave-surged vertical infralittoral rock
EIR.SG	SCAs.DenCla	<i>Dendrodoa grossularia</i> and <i>Clathrina coriacea</i> on wave-surged vertical infralittoral rock
EIR.SG	SCAs.ByH	Sponge crusts, colonial (polyclinid) ascidians and a bryozoan/hydroid turf on wave-surged vertical or overhanging infralittoral rock
EIR.SG	SC	Sponge crusts on extremely wave-surged infralittoral cave or gully walls
EIR.SG	CC	<i>Balanus crenatus</i> and/or <i>Pomatoceros triqueter</i> with spirorbid worms and coralline crusts on severely scoured infralittoral rock (No description at this level)

Higher code	Biotope code	Biotope
EIR.SG	CC.BalPom	<i>Balanus crenatus</i> and/or <i>Pomatoceros triqueter</i> with spirorbid worms and coralline crusts on severely scoured vertical infralittoral rock
MIR		Moderately exposed infralittoral rock
MIR.KR		Kelp with red seaweeds (moderately exposed rock)
MIR.KR	Ldig	<i>Laminaria digitata</i> on moderately exposed or tide-swept sublittoral fringe rock
MIR.KR	Ldig.Ldig	<i>Laminaria digitata</i> on moderately exposed sublittoral fringe rock
MIR.KR	Ldig.Ldig.Bo	<i>Laminaria digitata</i> and under-boulder fauna on sublittoral fringe boulders
MIR.KR	Lhyp	<i>Laminaria hyperborea</i> and foliose red seaweeds on moderately exposed infralittoral rock
MIR.KR	Lhyp.Ft	<i>Laminaria hyperborea</i> forest and foliose red seaweeds on moderately exposed upper infralittoral rock
MIR.KR	Lhyp.Pk	<i>Laminaria hyperborea</i> park and foliose red seaweeds on moderately exposed lower infralittoral rock
MIR.KR	Lhyp.TFt	<i>Laminaria hyperborea</i> forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock
MIR.KR	Lhyp.TPk	<i>Laminaria hyperborea</i> park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock
MIR.GzK		Grazed kelp with algal crusts
MIR.GzK	LhypGz	Grazed <i>Laminaria hyperborea</i> with coralline crusts on infralittoral rock
MIR.GzK	LhypGz.Ft	Grazed <i>Laminaria hyperborea</i> forest with coralline crusts on upper infralittoral rock
MIR.GzK	LhypGz.Pk	Grazed <i>Laminaria hyperborea</i> park with coralline crusts on lower infralittoral rock
MIR.SedK		Sand or gravel-affected or disturbed kelp and seaweed communities
MIR.SedK	LsacChoR	<i>Laminaria saccharina</i> , <i>Chorda filum</i> and dense red seaweeds on shallow unstable infralittoral boulders and cobbles
MIR.SedK	XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock
MIR.SedK	EphR	Ephemeral red seaweeds and kelps on tide-swept mobile infralittoral cobbles
MIR.SedK	HalXK	<i>Halidrys siliquosa</i> and mixed kelps on tide-swept infralittoral rock with coarse sediment
MIR.SedK	PolAhn	<i>Polyides rotundus</i> , <i>Ahnfeltia plicata</i> and <i>Chondrus crispus</i> on sand-covered infralittoral rock
SIR		Sheltered infralittoral rock
SIR.K		Silted kelp (stable rock)

Higher code	Biotope code	Biotope
SIR.K	LhypLsac	Mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> on sheltered infralittoral rock
SIR.K	LhypLsac.Ft	Mixed <i>Laminaria hyperborea</i> and <i>Laminaria saccharina</i> forest on sheltered upper infralittoral rock
SIR.K	Lsac	<i>Laminaria saccharina</i> on very sheltered infralittoral rock
SIR.K	Lsac.Ldig	<i>Laminaria saccharina</i> and <i>Laminaria digitata</i> on sheltered sublittoral fringe rock
SIR.K	Lsac.Ft	<i>Laminaria saccharina</i> forest on very sheltered upper infralittoral rock
SIR.K	Lsac.Pk	<i>Laminaria saccharina</i> park on very sheltered lower infralittoral rock
SIR.K	Lsac.Cod	Sparse <i>Laminaria saccharina</i> with <i>Codium</i> spp. and sparse red seaweeds on heavily silted very sheltered infralittoral rock
SIR.K	EchBriCC	<i>Echinus</i> , brittlestars and coralline crusts on grazed lower infralittoral rock
Infralittoral rock (other)		
IR.FaSwV		Fauna and seaweeds (shallow vertical rock)
IR.FaSwV	CorMetAlc	<i>Corynactis viridis</i> , <i>Metridium senile</i> and <i>Alcyonium digitatum</i> on exposed or moderately exposed vertical infralittoral rock
IR.FaSwV	AlcByH	<i>Alcyonium digitatum</i> and a bryozoan, hydroid and ascidian turf on moderately exposed vertical infralittoral rock
CR		CIRCALITTORAL ROCK (and other hard substrata)
ECR		Exposed circalittoral rock
ECR.EFa		Faunal crusts or short turfs (wave-exposed rock)
ECR.EFa	PomByC	<i>Pomatoceros triqueter</i> , <i>Balanus crenatus</i> and bryozoan crusts on mobile circalittoral cobbles and pebbles
ECR.Alc		<i>Alcyonium</i>-dominated communities (tide-swept/vertical)
ECR.Alc	AlcSec	<i>Alcyonium digitatum</i> with <i>Securiflustra securifrons</i> on weakly tide-swept or scoured moderately exposed circalittoral rock
ECR.Alc	AlcC	<i>Alcyonium digitatum</i> , <i>Pomatoceros triqueter</i> , algal and bryozoan crusts on vertical exposed circalittoral rock
MCR		Moderately exposed circalittoral rock
MCR.ByH		Bryozoan/hydroid turfs (sand-influenced)
MCR.ByH	Flu	<i>Flustra foliacea</i> and other hydroid/bryozoan turf species on slightly scoured circalittoral rock or mixed substrata
MCR.ByH	Flu.Flu	<i>Flustra foliacea</i> on slightly scoured silty circalittoral rock or mixed substrata
MCR.ByH	Flu.SerHyd	<i>Sertularia argentea</i> , <i>S. cupressina</i> and <i>Hydrallmania falcata</i> on tide-swept circalittoral cobbles and pebbles

Higher code	Biotope code	Biotope
MCR.M		Mussel beds (open coast circalittoral rock/mixed substrata)
MCR.M	MytHAs	<i>Mytilus edulis</i> beds with hydroids and ascidians on tide-swept moderately exposed circalittoral rock
MCR.M	Mus	<i>Musculus discors</i> beds on moderately exposed circalittoral rock
MCR.M	ModT	<i>Modiolus modiolus</i> beds with hydroids and red seaweeds on tide-swept circalittoral mixed substrata
MCR.Bri		Brittlestar beds
MCR.Bri	Oph	<i>Ophiothrix fragilis</i> and/or <i>Ophiocomina nigra</i> beds on slightly tide-swept circalittoral rock or mixed substrata
MCR.GzFa		Grazed fauna (moderately exposed or sheltered rock)
MCR.GzFa	FaAIC	Faunal and algal crusts, <i>Echinus esculentus</i> , sparse <i>Alcyonium digitatum</i> and grazing-tolerant fauna on moderately exposed circalittoral rock
MCR.GzFa	FaAIC.Abi	Faunal and algal crusts, <i>Echinus esculentus</i> , sparse <i>Alcyonium digitatum</i> , <i>Abietinaria abietina</i> and other grazing-tolerant fauna on moderately exposed circalittoral rock
		Circalittoral rock (other)
CR.FaV		Faunal turfs (deep vertical rock)
CR.FaV	Ant	<i>Antedon bifida</i> and a bryozoan/hydrroid turf on steep or vertical circalittoral rock
CR.FaV	Bug	<i>Bugula</i> spp. and other bryozoans on vertical moderately exposed circalittoral rock
SS		SUBLITTORAL SEDIMENTS
IGS		Infralittoral gravels and sands
IGS.Mrl		Maerl beds (open coast/clean sediments)
IGS.Mrl	Phy	<i>Phymatolithon calcareum</i> maerl beds in infralittoral clean gravel or coarse sand
IGS.Mrl	Phy.R	<i>Phymatolithon calcareum</i> maerl beds with red seaweeds in shallow infralittoral clean gravel or coarse sand
IGS.Mrl	Phy.HEc	<i>Phymatolithon calcareum</i> maerl beds with hydroids and echinoderms in deeper infralittoral clean gravel or coarse sand
IGS.FaG		Shallow gravel faunal communities
IGS.FaG	Sell	<i>Spisula elliptica</i> and venerid bivalves in infralittoral clean sand or shell-gravel
IGS.FaS		Shallow sand faunal communities
IGS.FaS	Mob	Sparse fauna in marine infralittoral mobile clean sand
IGS.FaS	NcirBat	<i>Nephtys cirrosa</i> and <i>Bathyporeia</i> spp. in infralittoral sand

Higher code	Biotope code	Biotope
IGS.FaS	ScupHyd	<i>Sertularia cupressina</i> and <i>Hydrallmania falcata</i> on tide-swept sublittoral cobbles or pebbles in coarse sand
IGS.FaS	Lcon	Dense <i>Lanice conchilega</i> and other polychaetes in tide-swept infralittoral sand
IGS.FaS	FabMag	<i>Fabulina fabula</i> and <i>Magelona mirabilis</i> with venerid bivalves in infralittoral compacted fine sand
CGS		Circalittoral gravels and sands
CGS	Ven	Venerid bivalves in circalittoral coarse sand or gravel
CGS	Ven.Neo	<i>Neopentadactyla mixta</i> and venerid bivalves in circalittoral shell-gravel or coarse sand
IMS		Infralittoral muddy sands
IMS.Sgr		Seagrass beds (sublittoral/lower shore)
IMS.Sgr	Zmar	<i>Zostera marina/angustifolia</i> beds in lower shore or infralittoral clean or muddy sand
IMS.FaMS		Shallow muddy sand faunal communities
IMS.FaMS	EcorEns	<i>Echinocardium cordatum</i> and <i>Ensis</i> sp. in lower shore or shallow sublittoral muddy fine sand
IMS.FaMS	SpiSpi	<i>Spio filicornis</i> and <i>Spiophanes bombyx</i> infralittoral clean or muddy sand
IMS.FaMS	Cap	<i>Capitella capitata</i> in enriched sublittoral muddy sediments
CMS		Circalittoral muddy sands
CMS	AbrNucCor	<i>Abra alba</i> , <i>Nucula nitida</i> and <i>Corbula gibba</i> in circalittoral muddy sand or slightly mixed sediment
CMS	AfilEcor	<i>Amphiura filiformis</i> and <i>Echinocardium cordatum</i> in circalittoral clean or slightly muddy sand
CMS	VirOph	<i>Virgularia mirabilis</i> and <i>Ophiura</i> spp. on circalittoral sandy or shelly mud
IMU		Infralittoral muds
IMU.MarMu		Shallow marine mud communities
IMU.MarMu	TubeAP	Semi-permanent tube-building amphipods and polychaetes in sublittoral mud or muddy sand
IMU.MarMu	AreSyn	<i>Arenicola marina</i> and synaptid holothurians in extremely shallow soft mud
IMU.MarMu	Ocn	<i>Ocnus planci</i> aggregations on sheltered sublittoral muddy sediment
CMU		Circalittoral muds
IMX		Infralittoral mixed sediments

Higher code	Biotope code	Biotope
IMX.KSw		<i>Laminaria saccharina</i> (sugar kelp) and filamentous seaweeds (mixed sediment)
IMX.KSw	LsacX	<i>Laminaria saccharina</i> , <i>Chorda filum</i> and filamentous red seaweeds on sheltered infralittoral sediment
IMX.KSw	Tra	Mats of <i>Trailliella</i> on infralittoral muddy gravel
IMX.KSw	Pcri	Loose-lying mats of <i>Phyllophora crispa</i> on infralittoral muddy sediment
IMX.FaMx		Shallow mixed sediment faunal communities
IMX.FaMx	VsenMtru	<i>Venerupis senegalensis</i> and <i>Mya truncata</i> in lower shore or infralittoral muddy gravel
CMX		Circalittoral mixed sediments
CMX	ModMx	<i>Modiolus modiolus</i> beds on circalittoral mixed sediment

References

- Connor, D.W., Brazier, D.P., Hill, T.O., & Northen, K.O. 1997a. Marine Nature Conservation Review: marine biotope classification for Britain and Ireland. Volume 1. Littoral biotopes. Version 97.06. *JNCC Report*, No. 229.
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- Howson, C.M., & Picton, B.E. eds. 1997. *The species directory of the marine fauna and flora of the British Isles and surrounding seas*. Belfast/Ross-on-Wye, Ulster Museum and Marine Conservation Society. (Ulster Museum Publication, No. 276)

Appendix B

Biotopes recorded in each area

The biotopes recorded in each area, using the data listed in Table 1, are summarised below. Biotope codes are given according to MNCR classification version 97.06 (Connor *et al.* 1997a, b).

Numbers refer to the *area summaries* as follows:

- | | | | |
|---|---------------------------|----|-----------------------------------|
| 1 | South Sanday | 6 | Eynhallow, Wyre and Rousay Sounds |
| 2 | Deer Sound | 7 | Wide Firth and Shapinsay Sound |
| 3 | Scapa Flow | 8 | Papa Westray |
| 4 | South-west Mainland | 9 | Eday Sound |
| 5 | Hoy Sound and Bring Deeps | 10 | North Sanday |

Area	1	2	3	4	5	6	7	8	9	10
<i>Littoral rock</i>										
YG	•	•	•	•	•	•	•		•	•
Pra	•				•	•				•
Ver.Por	•				•	•			•	•
Ver.B						•				
Ver.Ver	•	•	•	•	•	•	•		•	•
Chr									•	
MytB					•	•			•	
BPat.Cht					•					
BPat.Lic									•	
BPat.Fvesl	•	•				•			•	
BPat.Sem	•				•	•				•
Fdis					•	•			•	
Coff					•					
Him	•	•		•		•	•		•	•
FvesB	•	•	•		•	•	•		•	•
Fser.R	•		•		•	•			•	•
Fser.Fser	•	•	•	•	•	•	•		•	•
Fser.Fser.Bo			•			•			•	•
XR	•	•			•	•				
Mas					•					
Ent		•				•			•	•
Pel	•	•	•	•	•	•	•		•	•
Fspi	•	•	•	•	•	•	•		•	•
Fves		•	•	•			•			•
Asc.Asc	•	•	•	•	•	•	•		•	•
Asc.T							•			
Fserr.T							•			
FX							•			
FvesX										•
AscX		•		•						
FserX		•					•			
FserX.T			•			•				
EphX				•						
G			•							

Area	1	2	3	4	5	6	7	8	9	10
Cor	•	•				•			•	
FK	•				•	•			•	•
SwSed	•		•		•	•	•		•	
<i>Littoral sediment</i>										
LS										•
Tal	•						•			•
BarSnd					•					
AEur	•									
AP.P	•		•			•				•
AP.Pon	•		•		•					•
OI	•	•								
PCer		•								•
MacAre		•	•							•
HedMac	•									
HedMac.Are	•									
HedOI			•							
<i>Sublittoral rock</i>										
IR			•				•	•		
Ala.Myt	•	•	•		•	•			•	
Ala.Ldig	•	•	•			•	•			
LhypFa					•			•		
LhypR.Ft	•	•			•	•		•	•	
LhypR.Pk		•			•					
LsacSac	•	•	•		•	•			•	
FoR						•		•		
FoSwCC		•							•	
SCAs							•			
SCAs.DenCla	•	•					•		•	
SCAs.ByH		•			•	•				
SC		•			•	•			•	
CC.BalPom		•			•					
MIR								•		
Ldig.Ldig	•	•	•	•	•	•	•		•	•
Ldig.Ldig.Bo			•				•			
Lhyp								•		
Lhyp.Ft	•		•	•		•	•	•		•
Lhyp.Pk							•	•	•	
Lhyp.TFt	•			•		•	•	•	•	•
Lhyp.TPk				•		•	•		•	•
LhypGz.Ft		•	•		•			•		
LhypGz.Pk		•	•		•			•	•	
LsacChoR						•				•
XKScrR		•	•	•	•	•	•	•	•	•
EphR			•	•					•	•
HalXK						•				
PolAhn							•			•
LhypLsac						•	•			
LhypLsac.Ft	•		•	•		•	•	•		•
Lsac.Ldig	•	•	•	•						•
Lsac.Ft			•	•		•	•	•		
Lsac.Pk			•							
Lsac.Cod			•							•

Area	1	2	3	4	5	6	7	8	9	10
EchBriCC			•	•						
CorMetAlc						•				
AlcByH		•	•		•	•		•	•	
PomByC			•							
AlcSec				•	•	•				
AlcC								•		
Flu.Flu					•					
Flu.SerHyd							•			•
Mus								•		•
ModT							•		•	
Oph								•		•
FaAIC		•						•		
FaAIC.Abi					•				•	
Ant								•		
Bug		•								
<i>Sublittoral sediment</i>										
SS							•			
IGS		•	•	•		•		•		
Phy						•	•			
Phy.R				•		•	•		•	
Phy.HEc				•		•				
FaG						•				
Sell		•								
FaS	•			•		•	•	•	•	•
Mob					•					•
NcirBat							•			•
ScupHyd				•						
Leon		•								
FabMag			•	•			•			
CGS			•	•						
Ven	•		•				•			
Ven.Neo			•	•				•		
IMS			•	•						
Zmar		•				•		•		•
EcorEns	•		•	•		•				
SpiSpi				•			•			
Cap			•				•			
AbrNucCor				•			•			
AfilEcor			•							
VirOph			•	•			•			
TubeAP							•			
AreSyn		•		•						
Ocn							•			
CMU			•							
IMX				•						
LsacX				•		•	•	•	•	
Tra				•			•			
Pcri			•							
VsenMtru							•			
CMX				•			•			
ModMx			•	•						•

References

- Connor, D.W., Brazier, D.P., Hill, T.O., & Northen, K.O. 1997a. Marine Nature Conservation Review: marine biotope classification for Britain and Ireland. Volume 1. Littoral biotopes. Version 97.06. *JNCC Report*, No. 229.
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Appendix C

Species recorded

All taxa recorded during the surveys given in Table 1 are listed below; records of species noted in the text but not shown here come from additional published sources noted in the individual area summaries. Marine species nomenclature follows Howson & Picton (1996); that for higher plants follows Stace (1991), and that for lichens follows Purvis *et al.* (1992).

Numbers refer to the *area summaries* as follows:

- | | | | |
|---|---------------------------|----|-----------------------------------|
| 1 | South Sanday | 6 | Eynhallow, Wyre and Rousay Sounds |
| 2 | Deer Sound | 7 | Wide Firth and Shapinsay Sound |
| 3 | Scapa Flow | 8 | Papa Westray |
| 4 | South-west Mainland | 9 | Eday Sound |
| 5 | Hoy Sound and Bring Deeps | 10 | North Sanday |

Porifera

Clathrinidae indet.	1
<i>Clathrina coriacea</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Clathrina lacunosa</i>	9, 10
Leucosoleniidae indet.	6
<i>Leucosolenia</i> sp.	3, 6, 7
<i>Leucosolenia botryoides</i>	3, 4, 5, 6, 7
<i>Leucosolenia complicata</i>	1, 2, 3, 4, 5, 7, 9, 10
<i>Scypha ciliata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Leuconia nivea</i>	1, 2, 4, 5, 9, 10
<i>Grantia compressa</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Oscarella lobularis</i>	1, 4, 6, 7, 9
<i>Pachymatisma johnstonia</i>	1, 2, 4, 5, 6, 7, 8, 9, 10
<i>Suberites carnosus</i>	5, 7
<i>Suberites ficus</i>	3, 5, 6
<i>Polymastia</i> sp.	9
<i>Polymastia boletiformis</i>	4, 8, 9, 10
<i>Polymastia mamillaris</i>	4, 6, 9
<i>Cliona</i> sp.	5
<i>Cliona celata</i>	1, 4, 5, 6, 7, 8, 9, 10
<i>Axinella infundibuliformis</i>	4
<i>Stelligera rigida</i>	1, 4
<i>Halichondria</i> sp.	8
<i>Halichondria bowerbanki</i>	1, 3, 5, 10
<i>Halichondria panicea</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Hymeniacion perleve</i>	4, 5, 6, 7, 9
<i>Mycale</i> sp.	2, 5, 6
<i>Mycale lingua</i>	2
<i>Mycale macilentia</i>	7
<i>Mycale rotalis</i>	9, 10
<i>Biemna</i> sp.	2
<i>Biemna variantia</i>	2
<i>Esperiopsis fucorum</i>	1, 2, 3, 4, 6, 7, 9, 10
<i>Myxilla</i> sp.	2, 9, 10
<i>Myxilla incrustans</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Myxilla rosacea</i>	7
<i>Hymedesmia paupertas</i>	4
<i>Phorbas fictitius</i>	4
<i>Ophlitaspongia seriata</i>	4
<i>Microcionia</i> sp.	2, 8, 9
<i>Haliclona</i> sp.	5, 6, 10

<i>Haliclona cinerea</i>	2, 3, 7, 9
<i>Haliclona fistulosa</i>	6
<i>Haliclona urceolus</i>	4
<i>Haliclona viscosa</i>	1, 2, 4, 6, 7, 9, 10
<i>Dysidea fragilis</i>	2, 3, 4, 7, 9, 10
<i>Aplysilla sulfurea</i>	3, 4, 9
Halisarcidae indet.	2
<i>Halisarca dujardini</i>	1, 2, 3, 5, 7, 9, 10
Porifera indet. (crusts)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Cnidaria

<i>Haliclystus</i> sp.	1, 8, 10
<i>Haliclystus auricula</i>	2, 10
<i>Cyanea capillata</i>	8
<i>Cyanea lamarckii</i>	8
<i>Aurelia aurita</i>	3, 7
Hydrozoa indet.	3, 5, 6, 8, 9
<i>Tubularia indivisa</i>	2, 4, 6
<i>Tubularia larynx</i>	6
<i>Sarsia eximia</i>	10
<i>Eudendrium</i> sp.	5, 6, 9
<i>Eudendrium album</i>	5
<i>Eudendrium capillare</i>	10
<i>Eudendrium ramosum</i>	4, 10
<i>Bougainvillia ramosa</i>	3, 6, 9
<i>Garveia nutans</i>	9
<i>Hydractinia echinata</i>	1, 2, 3, 5, 6, 7, 10
<i>Clava multicornis</i>	3, 6, 7
<i>Calycella syringa</i>	5
<i>Lafoea dumosa</i>	4
<i>Halecium</i> sp.	4, 5, 7, 8
<i>Halecium beanii</i>	4, 7
<i>Halecium halecinum</i>	3, 4, 5, 6, 7, 8, 9, 10
<i>Halecium muricatum</i>	4, 9
<i>Aglaophenia</i> sp.	2, 6, 8
<i>Aglaophenia pluma</i>	6
<i>Halopteris catharina</i>	5
<i>Kirchenpaueria</i> sp.	2
<i>Kirchenpaueria pinnata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Nemertesia</i> sp.	8
<i>Nemertesia antennina</i>	3, 4, 5, 6, 7, 8, 9, 10
<i>Nemertesia ramosa</i>	3, 4, 5, 6, 7, 8, 9, 10

<i>Plumularia setacea</i>	3, 4, 5, 8, 10
<i>Polyplumaria</i> sp.	6
<i>Polyplumaria frutescens</i>	3, 4
<i>Ventromma halecioides</i>	4
<i>Abietinaria</i> sp.	8
<i>Abietinaria abietina</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Abietinaria filicula</i>	3, 4, 9
<i>Diphasia rosacea</i>	2, 4, 6, 9, 10
<i>Dynamena</i> sp.	7
<i>Dynamena pumila</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Hydrallmania falcata</i>	2, 3, 5, 6, 7, 8, 9
<i>Thuiaria thuja</i>	4, 6, 8
<i>Sertularella gayi</i>	4
<i>Sertularella polyzonias</i>	3
<i>Sertularella rugosa</i>	4
<i>Sertularia</i> sp.	6, 8, 10
<i>Sertularia argentea</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Sertularia cupressina</i>	1, 3, 5, 7, 9, 10
<i>Campanularia volubilis</i>	5
<i>Clytia hemisphaerica</i>	7, 9, 10
<i>Clytia paulensis</i>	7
<i>Laomedea flexuosa</i>	1, 5, 7
<i>Obelia</i> sp.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Obelia dichotoma</i>	2, 3, 5, 7
<i>Obelia geniculata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Obelia longissima</i>	3, 5, 9
<i>Orthopyxis integra</i>	9
<i>Rhizocaulus verticillatus</i>	3, 5, 9, 10
Anthozoa indet.	2, 7, 8
<i>Alcyonium digitatum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Virgularia mirabilis</i>	3, 5, 7
<i>Cerianthus lloydii</i>	1, 2, 3, 5, 6, 7, 8, 9
Actinairia indet.	5, 7
<i>Actinia equina</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Actinia fragacea</i>	5
<i>Anemonia viridis</i>	7
<i>Bolocera tuediae</i>	8
<i>Urticina</i> sp.	8
<i>Urticina felina</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Urticina eques</i>	1, 8
<i>Metridium senile</i>	3, 4, 5, 6, 8, 9
<i>Sagartia</i> sp.	8
<i>Sagartia elegans</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Sagartia troglodytes</i>	1, 6, 8, 9
<i>Cereus pedunculatus</i>	2, 8, 9
<i>Actinothoe</i> sp.	8
<i>Actinothoe sphyrodeta</i>	4, 8
<i>Sagartiogeton</i> sp.	6
<i>Sagartiogeton undatus</i>	3
<i>Adamsia carciniopados</i>	5, 6, 9
<i>Halcampa chrysanthellum</i>	5, 7
Edwardsiidae indet.	7, 9
<i>Edwardsia claparedii</i>	2, 3, 5, 6, 7
<i>Corynactis viridis</i>	4, 6, 8
<i>Caryophyllia smithii</i>	2, 3, 4, 5, 6, 8
Ctenophora	
<i>Bolinopsis infundibulum</i>	8
<i>Beroe</i> sp.	8
Platyhelminthes	
Turbellaria indet.	7
Planariidae indet.	1
Leptoplanidae indet.	1
Nemertea	
Nemertean indet.	2, 3, 5, 6, 7, 9, 10
<i>Tubulanus annulatus</i>	5
<i>Lineus longissimus</i>	1, 2, 4, 5, 7, 8, 9, 10
Emplectonematidae indet.	9
Nematoda	
Nematoda indet.	2, 3, 5, 6, 7, 10
<i>Paraturbanella cuanensis</i>	3
<i>Chromadorella filiformis</i>	1
<i>Halaphanolaimus pellucidus</i>	1
Priapulida	
<i>Halicryptus spinulosus</i>	7
<i>Priapulus caudatus</i>	3, 5, 7
Entoprocta	
<i>Pedicellina cernua</i>	3, 5
Chaetognatha	
<i>Sagitta</i> sp.	5, 7
Sipuncula	
<i>Golfingia elongata</i>	5, 7
<i>Golfingia margaritacea margaritacea</i>	3, 7
<i>Golfingia vulgaris vulgaris</i>	5, 6
<i>Nephasoma minutum</i>	1, 5, 7
<i>Thysanocardia procera</i>	5
<i>Phascolion strombus strombus</i>	3, 5
Echiura	
<i>Amalosoma eddystonense</i>	3, 5
Annelida	
Polychaeta indet.	1, 3, 4, 5, 6, 7, 8, 9, 10
<i>Chrysopetalum</i> sp.	5
<i>Pisione remota</i>	1, 2, 5, 6, 7
<i>Aphrodita aculeata</i>	3, 5, 7
Polynoidae indet.	6, 7
<i>Alentia gelatinosa</i>	4, 5, 9
<i>Antinoella</i> sp.	6
<i>Harmothoe</i> sp.	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Harmothoe extenuata</i>	4
<i>Harmothoe fragilis</i>	5
<i>Harmothoe imbricata</i>	7
<i>Harmothoe impar</i>	3, 5, 7
<i>Harmothoe ljunghmani</i>	6
<i>Harmothoe mcintoshii</i>	5, 6
<i>Harmothoe lunulata</i>	3, 5, 7
<i>Lepidonotus clava</i>	7
<i>Lepidonotus squamatus</i>	1, 3, 5, 7, 9
<i>Pholoe inornata</i>	2, 3, 5, 6, 7
<i>Pholoe synophthalmica</i>	3, 5, 7
<i>Sigalion mathildae</i>	1, 2, 3, 7
<i>Sthenelais</i> sp.	5, 7
<i>Sthenelais boa</i>	6
<i>Eteone</i> sp.	3
<i>Eteone flava</i>	2, 3, 5
<i>Hypereteone foliosa</i>	5
<i>Eteone longa</i>	1, 2, 3, 5, 6, 7, 10
<i>Hesionura elongata</i>	1
<i>Pseudomystides limbata</i>	2, 3, 5, 7
<i>Pseudomystides spinachia</i>	5, 7

<i>Anaitides longipes</i>	3, 5	<i>Sphaerosyllis hystrix</i>	3
<i>Anaitides maculata</i>	3, 7	<i>Sphaerosyllis taylora</i>	1, 3, 5, 7
<i>Anaitides mucosa</i>	1, 2, 6, 7	<i>Sphaerosyllis tetralix</i>	5, 7
<i>Anaitides rosea</i>	3, 7	<i>Autolytus</i> sp.	3
<i>Anaitides subulifera</i>	3, 7	<i>Proceraea</i> sp.	3
<i>Eulalia</i> sp.	3	<i>Hediste diversicolor</i>	1, 3
<i>Eulalia aurea</i>	7	<i>Nereis</i> sp.	3, 9
<i>Eulalia bilineata</i>	3, 5, 7	<i>Nereis longissima</i>	5
<i>Eulalia expusilla</i>	7	<i>Perinereis cultrifera</i>	1
<i>Eulalia viridis</i>	3, 5, 6, 7	<i>Platynereis dumerilii</i>	5, 6, 7
<i>Eulalia mustela</i>	5	<i>Nephtys</i> sp.	2, 5, 7, 9, 10
<i>Eumida</i> sp.	3	<i>Nephtys assimilis</i>	5
<i>Eumida bahusiensis</i>	3, 5, 7	<i>Nephtys caeca</i>	2, 5, 6, 7, 9
<i>Eumida sanguinea</i>	2, 5, 6, 7	<i>Nephtys ciliata</i>	6
<i>Notophyllum foliosum</i>	3	<i>Nephtys cirrosa</i>	3, 5, 9
<i>Phyllodoce</i> sp.	3	<i>Nephtys hombergii</i>	1, 2, 3, 5, 7, 10
<i>Phyllodoce laminosa</i>	6	<i>Nephtys kersivalensis</i>	2, 6
<i>Glycera</i> sp.	7	<i>Nephtys longosetosa</i>	3, 5, 7, 9
<i>Glycera alba</i>	3	<i>Nephtys pente</i>	5
<i>Glycera lapidum</i>	1, 2, 5, 6, 7, 9	<i>Pareurythoe borealis</i>	7
<i>Glycera oxycephala</i>	3	<i>Spinther</i> sp.	9
<i>Glycera tridactyla</i>	2, 3, 5, 7	<i>Lumbrineris</i> sp.	3
<i>Glycinde nordmanni</i>	3, 5	<i>Lumbrineris aniara</i>	3
<i>Goniada maculata</i>	3, 5, 7	<i>Lumbrineris fragilis</i>	7
<i>Goniadella</i> sp.	1	<i>Lumbrineris gracilis</i>	2, 3, 5, 7
<i>Ephesiella abyssorum</i>	5, 7	<i>Lumbrineris labrofimbriata</i>	10
<i>Commensodorum</i>	3	<i>Drilonereis filum</i>	3
<i>commensalis</i>		<i>Notocirrus scoticus</i>	3
<i>Sphaerodoropsis</i> sp.	7	<i>Dorvillea</i> sp.	7
<i>Sphaerodoropsis minuta</i>	5, 7	<i>Ophryotrocha</i> sp.	3, 5, 7
<i>Sphaerodoropsis philippi</i>	3	<i>Parougia caeca</i>	5, 7, 9
<i>Sphaerodorum gracilis</i>	3, 5, 7	<i>Protodorvillea kefersteini</i>	2, 3, 5, 7, 10
<i>Gyptis</i> sp.	3, 5, 7	<i>Schistomeringos</i> sp.	3
<i>Gyptis rosea</i>	6	<i>Schistomeringos neglecta</i>	1, 6
<i>Kefersteinia cirrata</i>	2, 3, 5, 6, 7	<i>Leitoscoloplos mammosus</i>	7
<i>Nereimyra punctata</i>	3, 5, 7	<i>Orbinia sertulata</i>	1, 2, 3, 6, 9
<i>Ophiodromus flexuosus</i>	3, 5, 7	<i>Scoloplos</i> sp.	10
<i>Podarke</i> sp.	3, 5	<i>Scoloplos armiger</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Syllidia armata</i>	3, 5, 7	<i>Aricidea</i> sp.	7
<i>Microphthalmus</i> sp.	1, 2, 7, 10	<i>Aricidea minuta</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Microphthalmus aberrans</i>	3	<i>Aricidea suecica</i>	7
<i>Syllidae</i> indet.	2	<i>Aricidea catherinae</i>	2
<i>Euryosyllis tuberculata</i>	5, 7	<i>Aricidea cerrutii</i>	1, 2, 3, 5, 10
<i>Ehlersia cornuta</i>	1, 2, 5, 6, 7	<i>Paradoneis lyra</i>	5
<i>Syllis</i> sp.	5, 7	<i>Paraonis fulgens</i>	1, 3, 7, 9, 10
<i>Trypanosyllis coeliaca</i>	2, 5, 6, 7	<i>Spionida</i> indet.	10
<i>Typosyllis</i> sp.	3	<i>Poecilochaetus serpens</i>	9
<i>Typosyllis armillaris</i>	3, 5, 7	<i>Spionidae</i> indet.	5
<i>Typosyllis variegata</i>	3	<i>Aonides oxycephala</i>	7
<i>Amblyosyllis formosa</i>	7	<i>Aonides paucibranchiata</i>	1, 2, 3, 5, 6, 7
<i>Eusyllis blomstrandii</i>	5, 7	<i>Laonice bahusiensis</i>	5, 6
<i>Odontosyllis</i> sp.	3	<i>Malacoceros</i> sp.	4, 5, 7
<i>Odontosyllis ctenostoma</i>	7	<i>Malacoceros fuliginosus</i>	4, 6
<i>Odontosyllis fulgurans</i>	5	<i>Malacoceros tetracerus</i>	7
<i>Odontosyllis gibba</i>	5, 7	<i>Minuspio cirrifera</i>	6
<i>Streptosyllis bidentata</i>	1	<i>Polydora</i> sp.	1, 2, 3, 6, 7, 9
<i>Streptosyllis websteri</i>	1, 2, 3, 5, 6, 7, 10	<i>Polydora caeca</i>	3, 5, 7, 9
<i>Syllides benedicti</i>	2, 3, 5, 7, 9	<i>Polydora caulleryi</i>	3, 5, 7
<i>Syllides longocirrata</i>	3	<i>Polydora ciliata</i>	3, 7
<i>Exogone hebes</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Polydora quadrilobata</i>	1, 3, 7, 8
<i>Exogone naidina</i>	1, 2, 3, 5, 7, 9, 10	<i>Prionospio dubia</i>	5, 7
<i>Exogone verugera</i>	2, 3, 5, 7	<i>Prionospio fallax</i>	2, 3, 5, 7
<i>Sphaerosyllis</i> sp.	6	<i>Prionospio banyulensis</i>	5, 7
<i>Sphaerosyllis bulbosa</i>	5, 6, 7	<i>Tharyx</i> sp.	10
<i>Sphaerosyllis erinaceus</i>	5, 7	<i>Pseudopolydora antennata</i>	6

<i>Pseudopolydora pulchra</i>	1, 2, 3, 5, 6, 7, 9	<i>Rhodine gracilior</i>	3
<i>Pygospio elegans</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Ophelia</i> sp.	3, 7
<i>Scolecopsis squamata</i>	3	<i>Ophelia bicornis</i>	6
<i>Spio</i> sp.	7	<i>Ophelia rathkei</i>	1, 2, 3, 6, 10
<i>Spio armata</i>	5, 7	<i>Travisia forbesii</i>	2, 5, 6, 7, 9, 10
<i>Spio decorata</i>	5, 7, 9	<i>Ophelina acuminata</i>	3, 5, 7
<i>Spio filicornis</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Ophelina modesta</i>	3, 5
<i>Spio martinensis</i>	1, 2, 3, 6, 7, 9, 10	<i>Scalibregma celticum</i>	5, 7
<i>Spiophanes bombyx</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Scalibregma inflatum</i>	3, 5, 7
<i>Spiophanes kroyeri</i>	3, 7	<i>Polygordius</i> sp.	5, 6, 7
<i>Streblospio shrubsolei</i>	5	<i>Protodrilus</i> sp.	10
<i>Magelona alleni</i>	3, 5	<i>Protodriloides chaetifer</i>	10
<i>Magelona filiformis</i>	3	<i>Galathowenia oculata</i>	3, 5, 7
<i>Magelona minuta</i>	5	<i>Owenia fusiformis</i>	2, 3, 5, 6, 7, 10
<i>Chaetopterus</i> sp.	4	<i>Terebellida</i> indet.	9
<i>Chaetopterus variopedatus</i>	2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Amphictene auricoma</i>	3
Cirratulidae indet.	2, 10	<i>Lagis koreni</i>	3, 5, 7
<i>Caulleriella</i> sp.	3	<i>Pectinaria</i> sp.	6
<i>Caulleriella alata</i>	3, 5, 7	<i>Sabellaria spinulosa</i>	1, 5, 6
<i>Tharyx killariensis</i>	4, 5, 7	<i>Ampharete</i> sp.	3
<i>Caulleriella zetlandica</i>	5, 7	<i>Ampharete baltica</i>	3
<i>Chaetozone setosa</i>	1, 2, 3, 5, 6, 7, 10	<i>Ampharete falcata</i>	3, 7
<i>Cirratulus</i> sp.	3, 5, 7	<i>Ampharete lindstroemi</i>	2, 3, 5, 7
<i>Cirratulus cirratus</i>	3	<i>Amphicteis gunneri</i>	3, 5
<i>Cirriformia</i> sp.	7	<i>Anobothrus gracilis</i>	3, 5
<i>Cirriformia tentaculata</i>	5, 6	<i>Sosane sulcata</i>	3
<i>Dodecaceria</i> sp.	5, 9	<i>Terebellides</i> sp.	7
<i>Aphelochaeta marioni</i>	7	<i>Terebellides stroemi</i>	3, 5, 7
<i>Aphelochaeta</i>	3	<i>Trichobranchus glacialis</i>	7
<i>multibranchiis</i>		<i>Trichobranchus roseus</i>	3, 5, 7
<i>Psammodrilus</i>	1, 3, 9, 10	<i>Terebellidae</i> indet.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>balanoglossoides</i>		<i>Amphitrite cirrata</i>	3
<i>Diplocirrus glaucus</i>	3, 5, 7	<i>Amphitritides gracilis</i>	5
<i>Flabelligera affinis</i>	5, 7	<i>Eupolymnia nebulosa</i>	1, 2, 3, 5, 6, 8, 9
<i>Pherusa flabellata</i>	7	<i>Eupolymnia nesidensis</i>	3, 6
<i>Pherusa plumosa</i>	3, 5, 7	<i>Lanassa</i> sp.	3
<i>Macrochaeta</i> sp.	5, 6	<i>Lanice conchilega</i>	1, 2, 3, 5, 6, 7, 8, 9, 10
<i>Macrochaeta clavicornis</i>	3	<i>Neoamphitrite affinis</i>	7
<i>Capitella</i> sp.	1, 3, 4, 5, 7, 9, 10	<i>Nicolea venustula</i>	5, 7, 10
<i>Capitella capitata</i>	2, 3, 6, 7	<i>Pista cristata</i>	3, 5, 6, 7
<i>Capitomastus minimus</i>	3	<i>Polycirrus</i> sp.	2, 3, 5, 7
<i>Heteromastus filiformis</i>	3, 7	<i>Polycirrus aurantiacus</i>	3
<i>Mediomastus fragilis</i>	1, 2, 3, 5, 6, 7, 9	<i>Polycirrus medusa</i>	2
<i>Notomastus</i> sp.	1, 3, 5, 7, 9	<i>Polycirrus norvegicus</i>	6, 7
<i>Notomastus latericeus</i>	2, 3, 6, 7	<i>Polycirrus plumosus</i>	3
<i>Peresiella clymenoides</i>	5	<i>Thelepus cinnamatus</i>	3
<i>Arenicola</i> sp.	1, 3, 7, 10	<i>Sabellidae</i> indet.	3, 7, 10
<i>Arenicola marina</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Branchiomma bombyx</i>	5, 7
Maldanidae indet.	6, 9	<i>Chone</i> sp.	1, 3, 7, 8
<i>Praxillura longissima</i>	5, 7	<i>Chone duneri</i>	1, 2, 3, 5, 7
Euclymeninae indet.	7	<i>Chone fauveli</i>	2, 7
<i>Clymenura</i> sp.	1, 3, 5, 7, 9, 10	<i>Chone filicaudata</i>	5, 6
<i>Clymenura johnstoni</i>	2, 3, 6, 7	<i>Demonax cambrensis</i>	7
<i>Euclymene</i> sp.	5, 7	<i>Euchone</i> sp.	5, 7
<i>Euclymene lumbricoides</i>	6	<i>Euchone rubrocincta</i>	3
<i>Euclymene oerstedii</i>	2, 6	<i>Fabricia sabella</i>	1, 2, 6, 10
<i>Heteroclymene robusta</i>	1, 5, 7, 9, 10	<i>Jasmineira caudata</i>	3
<i>Praxillella affinis</i>	3, 5, 7, 9	<i>Jasmineira elegans</i>	7
<i>Praxillella gracilis</i>	6	<i>Myxicola</i> sp.	8
<i>Praxillella praetermissa</i>	5, 7	<i>Myxicola aesthetica</i>	3
<i>Micromaldane</i>	7	<i>Myxicola infundibulum</i>	3, 8
<i>ornithochaeta</i>		<i>Potamilla</i> sp.	3
<i>Nicomache</i> sp.	5, 7	<i>Sabella</i> sp.	2, 3, 5, 6, 8
<i>Nicomache trispinata</i>	3	<i>Sabella pavonina</i>	1, 2, 3, 5, 6, 7, 8, 9, 10
<i>Rhodine</i> sp.	7	<i>Ditrupa arietina</i>	3

<i>Hydroides</i> sp.	3, 5	<i>Pontocrates</i> sp.	7
<i>Hydroides norvegica</i>	1, 3, 5, 9, 10	<i>Pontocrates altamarinus</i>	1, 5, 10
<i>Pomatoceros</i> sp.	6, 8	<i>Pontocrates arenarius</i>	1, 2, 4, 5, 6, 10
<i>Pomatoceros lamarki</i>	2, 3, 5, 8	<i>Synchelidium haplocheles</i>	3
<i>Pomatoceros triquetter</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Synchelidium maculatum</i>	1, 3, 5, 7
<i>Serpula vermicularis</i>	3	<i>Westwoodilla</i> sp.	7
<i>Filograna</i> sp.	2	<i>Westwoodilla caecula</i>	2, 3, 7
<i>Filograna implexa</i>	1, 2, 4, 6, 7, 9	<i>Amphilochooides serratipes</i>	7
<i>Protula tubularia</i>	3, 5	<i>Amphilochus manudens</i>	5, 7
<i>Salmacina</i> sp.	8	<i>Amphilochus spencebatei</i>	3
<i>Salmacina dysteri</i>	6, 7, 8, 9, 10	<i>Gitana sarsi</i>	5, 7
Spirorbidae indet.	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Paramphilochooides</i>	5
<i>Circeis spirillum</i>	4, 7	<i>odontonyx</i>	
<i>Spirorbis</i> sp.	2, 6, 10	<i>Peltocoxa brevisrostris</i>	5
<i>Spirorbis corallinae</i>	1, 4, 6, 7	<i>Leucothoe incisa</i>	1, 2, 5, 6, 7, 9, 10
<i>Spirorbis rupestris</i>	7	<i>Leucothoe lilljeborgi</i>	3, 7
<i>Spirorbis spirorbis</i>	1, 2, 3, 6, 7, 9	<i>Cressa dubia</i>	5
<i>Oligochaeta</i> indet.	1, 2, 3, 5, 6, 7, 9, 10	Stenothoidae indet.	7
<i>Paranais litoralis</i>	3, 7, 9, 10	<i>Stenothoe monoculoides</i>	1, 7, 9
<i>Heterochaeta costata</i>	1, 2	Talitroidea indet.	3
<i>Tubificoides amplivasatus</i>	7	<i>Hyale</i> sp.	7
<i>Tubificoides benedii</i>	1, 2, 7, 10	<i>Hyale prevostii</i>	3, 6, 9
<i>Tubificoides pseudogaster</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Talitrus saltator</i>	7
<i>Tubificoides swirencoides</i>	3	<i>Talorchestia deshayesii</i>	1, 10
Enchytraeidae indet.	1, 2, 3, 4, 7, 9, 10	<i>Urothoe elegans</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Grania</i> sp.	1, 3, 5, 7, 9, 10	<i>Urothoe marina</i>	1, 2, 3, 5, 6, 7, 9
Chelicerata		<i>Harpinia antennaria</i>	1, 2, 3, 5, 7, 9, 10
Pycnogonida indet.	1, 4, 5, 7	<i>Harpinia crenulata</i>	3, 5, 7
<i>Nymphon brevisrostre</i>	7	<i>Harpinia laevis</i>	1, 3, 5, 7, 9
<i>Nymphon gracile</i>	8	<i>Harpinia pectinata</i>	1, 5, 7, 9, 10
<i>Achelia echinata</i>	5, 7	<i>Parametaphoxus fultoni</i>	3, 5, 6, 7
<i>Callipallene brevisrostris</i>	5	<i>Metaphoxus pectinatus</i>	3
<i>Anoplodactylus petiolatus</i>	7	<i>Phoxocephalus</i> sp.	7
Pycnogonidae indet.	1	<i>Phoxocephalus holbolli</i>	1, 2, 3, 6, 9, 10
<i>Pycnogonum littorale</i>	5, 6, 7, 9	<i>Acidostoma obesum</i>	3
Halacaridae indet.	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Acidostoma nodiferum</i>	3
Crustacea		<i>Anonyx lilljeborgi</i>	7
Cirripedia indet.	1, 3, 6, 8, 9	<i>Anonyx sarsi</i>	2, 6
<i>Verruca stroemia</i>	1, 3, 4, 5, 6, 7, 9, 10	<i>Hippomedon</i> sp.	7
<i>Chthamalus montagui</i>	2, 4, 6	<i>Hippomedon denticulatus</i>	1, 2, 7, 9, 10
<i>Chthamalus stellatus</i>	1, 2, 3, 4, 5, 6, 9	<i>Lepidepcreum longicorne</i>	5, 7
<i>Balanus</i> sp.	7, 8	<i>Lysianassa ceratina</i>	3, 7
<i>Semibalanus balanoides</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Lysianassa plumosa</i>	5, 7
<i>Balanus balanus</i>	1, 2, 3, 4, 5, 6, 9, 10	<i>Menigrates obtusifrons</i>	3
<i>Balanus crenatus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Orchomene</i> sp.	7
Copepoda indet.	7	<i>Orchomene humilis</i>	3
Harpacticoida indet.	2, 6	<i>Orchomene nanus</i>	5, 6, 7, 9
<i>Tigriopus</i> sp.	2	<i>Socarnes erythropthalmus</i>	3, 5, 7
<i>Tigriopus brevicornis</i>	9	<i>Tmetonyx cicada</i>	7
<i>Alteutha</i> sp.	5, 7	<i>Tmetonyx similis</i>	3, 6, 7, 9
Ostracoda indet.	5, 7	<i>Tryphosites longipes</i>	1, 2, 3, 6, 7, 9, 10
<i>Nebalia bipes</i>	3, 5, 6, 7, 9	<i>Austrosyrrhoe fimbriatus</i>	5, 7
Mysidae indet.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Argissa</i> sp.	7
<i>Erythrops elegans</i>	7	<i>Argissa hamatipes</i>	5, 10
<i>Praunus flexuosus</i>	1, 2	<i>Iphimedia</i> sp.	5
<i>Heteromysis formosa</i>	7	<i>Iphimedia minuta</i>	3, 5, 7
Amphipoda indet.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Iphimedia spatula</i>	7
Gammaridea indet.	7	<i>Liljeborgia pallida</i>	5, 7
<i>Apherusa bispinosa</i>	5	<i>Atylus</i> sp.	5
<i>Calliopius laeviusculus</i>	1, 3	<i>Atylus falcatus</i>	2
Gammarellidae indet.	1	<i>Atylus swammerdamei</i>	1, 5, 7, 10
<i>Eusirus longipes</i>	6	<i>Atylus vedlomensis</i>	5, 6, 7
<i>Monoculodes carinatus</i>	1, 2, 3, 5, 7, 10	<i>Dexamine spinosa</i>	2, 5, 7, 10
<i>Periculodes longimanus</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Dexamine thea</i>	1, 3, 5, 7, 10
		<i>Guerneia coalita</i>	3, 5, 7

<i>Ampelisca</i> sp.	3	<i>Cirolana</i> sp.	7
<i>Ampelisca brevicornis</i>	1, 2, 3, 6, 7, 9, 10	<i>Cirolana borealis</i>	5, 7
<i>Ampelisca diadema</i>	5, 7	<i>Eurydice</i> sp.	7
<i>Ampelisca tenuicornis</i>	2, 3, 5, 6, 7	<i>Eurydice affinis</i>	7
<i>Ampelisca typica</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Eurydice pulchra</i>	1, 2, 3, 6, 10
<i>Bathyporeia</i> sp.	1, 7, 9	<i>Cymodoce truncata</i>	5, 7
<i>Bathyporeia elegans</i>	1, 3, 4, 5, 7, 9, 10	<i>Sphaeroma rugicauda</i>	6
<i>Bathyporeia gracilis</i>	3	<i>Jaera albifrons</i>	1, 3, 9, 10
<i>Bathyporeia guilliamsoniana</i>	1, 3, 5, 7, 9, 10	<i>Janira</i> sp.	1
<i>Bathyporeia nana</i>	1, 3	<i>Janira maculosa</i>	1, 6, 7
<i>Bathyporeia pelagica</i>	1, 2, 3, 6, 10	<i>Munna</i> sp.	5, 7, 10
<i>Bathyporeia pilosa</i>	1, 3	<i>Munna minuta</i>	3
<i>Bathyporeia sarsi</i>	1, 3, 7, 9, 10	<i>Idotea</i> sp.	2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Bathyporeia tenuipes</i>	3	<i>Idotea baltica</i>	1, 3, 5, 7, 9, 10
Gammaridae indet.	2, 4, 5, 6, 7, 9, 10	<i>Idotea emarginata</i>	1, 5
<i>Echinogammarus stoerensis</i>	2	<i>Idotea granulosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Gammarus</i> sp.	7	<i>Idotea linearis</i>	10
<i>Megaluropus</i> sp.	7	<i>Idotea neglecta</i>	5
<i>Megaluropus agilis</i>	1, 9, 10	<i>Arcturella damnoniensis</i>	7
<i>Ceradocus semiserratus</i>	5, 7	<i>Arcturella dilatata</i>	5, 7
<i>Cheirocratus</i> sp.	5, 7	<i>Astacilla</i> sp.	7
<i>Cheirocratus sundevallii</i>	3, 5, 7	<i>Astacilla longicornis</i>	3
<i>Maera othonis</i>	3, 5, 7	<i>Ligia</i> sp.	7
<i>Ampithoe rubricata</i>	7	<i>Ligia oceanica</i>	2, 3, 4, 5, 6, 9
<i>Ampithoe gammaroides</i>	10	Tanaidae indet.	7
<i>Gammaropsis maculata</i>	3, 7	<i>Tanais dulongii</i>	1, 2
<i>Gammaropsis palmata</i>	5, 7	<i>Leptognathia breviremis</i>	3
<i>Gammaropsis cornuta</i>	3, 5, 7, 9	<i>Leptognathia gracilis</i>	3, 5, 7
<i>Microprotopus maculatus</i>	1, 3, 5, 7, 9, 10	<i>Leptognathia paramanca</i>	7
<i>Photis longicaudata</i>	3, 7	<i>Pseudoparatanais batei</i>	5, 7
<i>Ericthonius difformis</i>	3	<i>Tanaopsis graciloides</i>	3, 5, 6, 7
<i>Ericthonius punctatus</i>	7	<i>Typhlotanais</i> sp.	7
<i>Ischyrocerus anguipes</i>	10	<i>Typhlotanais pulcher</i>	6
<i>Jassa</i> sp.	2, 4, 5, 6, 7, 9, 10	<i>Tanaissus lilljeborgi</i>	1, 5, 7, 9, 10
<i>Jassa falcata</i>	1, 2, 4, 9	Cumacea indet.	7
<i>Microjassa cumbrensis</i>	3	<i>Cumopsis goodsiri</i>	7
Aoridae indet.	3, 5, 7	<i>Vauntompsonia cristata</i>	3, 5, 7
<i>Aora gracilis</i>	3, 5, 7	<i>Bodotria pulchella</i>	1, 10
<i>Autonoe longipes</i>	5	<i>Bodotria scorpioides</i>	7, 10
<i>Lembos websteri</i>	7	<i>Iphinoe serrata</i>	3, 5
<i>Leptocheirus hirsutimanus</i>	3, 5, 6, 7	<i>Iphinoe trispinosa</i>	1, 2, 6, 10
<i>Leptocheirus pectinatus</i>	3, 5, 7	<i>Eudorella truncatula</i>	3, 5, 7
<i>Leptocheirus pilosus</i>	7	<i>Eudorellopsis deformis</i>	5, 7, 10
<i>Microdeutopus</i> sp.	5	<i>Cumella pygmaea</i>	1, 3, 5, 7
<i>Microdeutopus anomalus</i>	3	<i>Nannastacus unguiculatus</i>	1, 5, 7
<i>Corophium</i> sp.	3, 5, 7	<i>Pseudocuma longicornis</i>	1, 3, 5, 7, 9, 10
<i>Corophium acherusicum</i>	5, 7	<i>Diastylis cornuta</i>	7
<i>Corophium bonnellii</i>	3, 7, 10	<i>Diastylis laevis</i>	6, 7
<i>Corophium crassicorne</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Diastylis rugosa</i>	3, 5, 7
<i>Corophium volutator</i>	3, 9	<i>Diastylis biplicata</i>	3
<i>Siphonoecetes kroyeranus</i>	1, 2, 3, 6, 7, 9, 10	Decapoda indet.	4, 6
<i>Dyopedos porrectus</i>	6, 10	Caridea indet.	1, 2, 3, 5
Caprellidae indet.	1, 2, 3, 4, 6, 7, 8, 9, 10	<i>Palaemon serratus</i>	7, 9
<i>Caprella</i> sp.	3, 8	<i>Eualus gaimardii</i>	3
<i>Caprella acanthifera</i>	3, 5, 7, 10	<i>Thoralus cranchii</i>	5
<i>Caprella linearis</i>	2, 9	<i>Pandalus montagui</i>	2, 6, 7
<i>Pariambus typicus</i>	1, 2, 3, 5, 6, 7, 9, 10	Crangonidae indet.	6
<i>Phtisica marina</i>	3, 5, 6, 7	<i>Crangon</i> sp.	3, 10
<i>Pseudoprotella phasma</i>	3	<i>Crangon crangon</i>	1, 2, 3, 6, 7, 8, 10
Isopoda indet.	2, 3, 10	<i>Pontophilus</i> sp.	7
<i>Gnathia</i> sp.	3, 5, 7	<i>Homarus gammarus</i>	4, 8, 9
<i>Gnathia maxillaris</i>	7	<i>Upogebia deltaura</i>	3, 9
<i>Gnathia oxyuraea</i>	5, 7, 9	Paguridae indet.	3, 6, 8, 10
<i>Anthura gracilis</i>	7	<i>Anapagurus hyndmanni</i>	1, 4, 5, 6, 9
		<i>Pagurus</i> sp.	3, 4, 5, 6, 8

<i>Pagurus bernhardus</i>	1, 2, 3, 5, 6, 7, 8, 9, 10	<i>Patella vulgata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Pagurus cuanensis</i>	3, 7, 10	<i>Helcion pellucidum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Pagurus prideaux</i>	5, 6, 9	<i>Margarites helicinus</i>	2, 3, 4, 5, 6, 7
<i>Pagurus pubescens</i>	9	<i>Gibbula</i> sp.	5, 7, 8
<i>Galathea</i> sp.	2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Gibbula magus</i>	2, 3, 5, 6, 7, 8
<i>Galathea dispersa</i>	3	<i>Gibbula tumida</i>	3, 4, 5, 7, 9
<i>Galathea intermedia</i>	3, 5, 9	<i>Gibbula cineraria</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Galathea nexa</i>	1, 3, 4, 5	<i>Gibbula umbilicalis</i>	1, 2, 3, 6, 7, 8, 9
<i>Galathea squamifera</i>	1, 2, 3, 5, 6, 7, 8, 9	<i>Calliostoma zizyphinum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Galathea strigosa</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Dikoleps pusilla</i>	5, 7
<i>Munida rugosa</i>	3, 5, 9	<i>Skenea serpuloides</i>	3, 5, 7
<i>Pisidia longicornis</i>	1, 2, 3, 4, 5, 7	Littorinidae indet.	6
<i>Porcellana platycheles</i>	3, 5, 6	<i>Lacuna pallidula</i>	1, 6, 7, 9
<i>Ebalia tuberosa</i>	1, 9, 10	<i>Lacuna vincta</i>	1, 2, 3, 5, 9
<i>Hyas</i> sp.	2, 3, 5, 6, 7	<i>Littorina</i> sp.	4, 6, 9
<i>Hyas araneus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Littorina littorea</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Hyas coarctatus</i>	1, 3, 5, 6, 7, 10	<i>Littorina mariaae</i>	6
<i>Inachus</i> sp.	5, 8	<i>Littorina obtusata</i>	6, 9
<i>Inachus dorsettensis</i>	1, 3, 5, 6, 8, 9, 10	<i>Littorina neglecta</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Inachus leptochirus</i>	5	<i>Littorina nigrolineata</i>	1, 3, 5, 9
<i>Inachus phalangium</i>	3, 4, 7	<i>Littorina saxatilis</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Macropodia</i> sp.	5, 6, 7	<i>Littorina obtusata/mariaae</i>	1, 2, 3, 4, 5, 7, 9, 10
<i>Macropodia rostrata</i>	1, 3, 5, 6, 7, 9	<i>Melarhaphe neritoides</i>	1, 2, 4, 5, 6, 7, 9, 10
<i>Macropodia tenuirostris</i>	3, 7	<i>Rissoa</i> sp.	3, 7
<i>Eurynome aspera</i>	5	<i>Rissoa interrupta</i>	7
<i>Corystes cassivelaunus</i>	3	<i>Rissoa parva</i>	7
<i>Atelecyclus rotundatus</i>	6, 7, 8, 9, 10	<i>Pusillina inconspicua</i>	3, 5
<i>Cancer pagurus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Pusillina sarsi</i>	3, 5, 7
<i>Liocarcinus</i> sp.	7	<i>Alvania beanii</i>	5
<i>Liocarcinus corrugatus</i>	2, 5, 6, 9	<i>Alvania cimicoides</i>	5
<i>Liocarcinus depurator</i>	1, 2, 3, 5, 6, 7, 8, 10	<i>Alvania punctura</i>	5, 7
<i>Liocarcinus holsatus</i>	3, 5, 8	<i>Cingula</i> sp.	9
<i>Liocarcinus marmoratus</i>	2, 3, 8, 9, 10	<i>Onoba aculeus</i>	3, 5, 7
<i>Liocarcinus pusillus</i>	7, 9	<i>Onoba semicostata</i>	3, 5, 7
<i>Necora puber</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Obtusella intersecta</i>	5, 7
<i>Carcinus maenas</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Skeneopsis planorbis</i>	1, 6, 9, 10
<i>Monodaeus couchi</i>	3	<i>Rissoella diaphana</i>	3, 7
<i>Pilumnus hirtellus</i>	2	<i>Rissoella globularis</i>	5, 7
<i>Xantho</i> sp.	8	<i>Rissoella opalina</i>	7
Insecta		<i>Caecum glabrum</i>	1, 5, 7
Insecta indet.	6	<i>Turritella communis</i>	3, 5
Chironomida indet.	5, 7, 2	<i>Chrysallida decussata</i>	5
<i>Petrobius maritimus</i>	3, 9	<i>Odostomia acuta</i>	3
<i>Anurida maritima</i>	1, 2, 3, 4, 6, 7, 9, 10	<i>Odostomia plicata</i>	7
Mollusca		<i>Odostomia turrita</i>	5
<i>Chaetoderma nitidulum</i>	3, 5	<i>Brachystomia</i> sp.	5
Polyplacophora indet.	1, 2, 3, 5, 6, 7, 8, 9, 10	<i>Brachystomia eulimoides</i>	5
<i>Leptochiton asellus</i>	1, 3, 4, 5, 6, 7, 9, 10	<i>Eulimella ventricosa</i>	9, 10
<i>Leptochiton cancellatus</i>	3, 7	<i>Ebala nitidissima</i>	5, 7
<i>Ischnochiton albus</i>	3, 7	<i>Turbonilla</i> sp.	3
<i>Lepidochitona</i> sp.	9	<i>Cima minima</i>	3, 5, 7
<i>Lepidochitona cinerea</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Melanella alba</i>	9
<i>Tonicella marmorea</i>	1, 2, 5, 7, 9	<i>Vitreolina philippi</i>	3, 5, 7
<i>Tonicella rubra</i>	1, 2, 3, 4, 7, 9	<i>Aporrhais pespelecani</i>	7
<i>Callochiton septemvalvis</i>	2, 3	<i>Capulus ungaricus</i>	3, 5, 9
<i>Acanthochiton</i> sp.	2	<i>Trivia</i> sp.	9
<i>Acanthochiton crinita</i>	2, 7	<i>Trivia arctica</i>	1, 2, 3, 4, 5, 6, 7, 9
<i>Emarginula fissura</i>	1, 3, 5	<i>Trivia monacha</i>	2, 4, 6, 8, 9
<i>Diodora graeca</i>	6	<i>Erato voluta</i>	9
<i>Tectura testudinalis</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Velutina velutina</i>	5
<i>Tectura virginea</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Polinices</i> sp.	7, 8, 9
<i>Patella</i> sp.	6	<i>Polinices montagui</i>	9
<i>Patella depressa</i>	4	<i>Polinices pulchellus</i>	1, 3, 5, 7, 8, 9
<i>Patella ulyssiponensis</i>	4, 9	<i>Nucella lapillus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
		<i>Buccinum undatum</i>	1, 2, 3, 5, 6, 7, 8, 9, 10

<i>Neptunea antiqua</i>	10	<i>Mytilus edulis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Colus</i> sp.	8, 10	<i>Crenella decussata</i>	1, 3, 5, 7, 10
<i>Hinia</i> sp.	3	<i>Musculus discors</i>	1, 2, 5, 7, 10
<i>Hinia incrassata</i>	1, 3, 4, 5, 6, 7, 9	<i>Musculus niger</i>	7, 10
<i>Hinia reticulata</i>	2, 3	<i>Modiolarca tumida</i>	5, 3
<i>Mangelia</i> sp.	3	<i>Modiolus</i> sp.	5, 7, 8
<i>Mangelia smithii</i>	7	<i>Modiolus modiolus</i>	1, 3, 5, 6, 7, 8, 9, 10
<i>Opisthobranchia</i> indet.	8, 9	<i>Arca tetragona</i>	5
<i>Cylichna cylindracea</i>	3, 5	<i>Glycymeris glycymeris</i>	5, 6, 9
<i>Philine aperta</i>	2, 5, 7	<i>Limacea</i> indet.	8
<i>Diaphana minuta</i>	3, 5, 7, 9	<i>Limaria loscombi</i>	5, 7
<i>Retusa</i> sp.	7	<i>Limatula subauriculata</i>	5, 7
<i>Retusa obtusa</i>	1, 7, 9, 10	<i>Palliolum tigrinum</i>	5
<i>Retusa truncatula</i>	3, 5	<i>Chlamys</i> sp.	7
<i>Retusa umbilicata</i>	3, 5	<i>Chlamys distorta</i>	4, 5, 7, 9, 10
<i>Runcina coronata</i>	7	<i>Chlamys varia</i>	1, 3, 4, 5
<i>Elysia viridis</i>	3, 5, 7, 9	<i>Aequipecten opercularis</i>	3, 5, 6, 7, 9
<i>Hermaea bifida</i>	7, 10	<i>Pecten maximus</i>	2, 3, 5, 6, 7, 8, 9
<i>Limapontia capitata</i>	7	<i>Anomiidae</i> indet.	5, 7, 9
<i>Limapontia depressa</i>	1, 3	<i>Anomia ehippium</i>	6
<i>Alderia modesta</i>	10	<i>Pododesmus patelliformis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Akera bullata</i>	2, 3	<i>Heteranomia squamula</i>	3, 5
<i>Aplysia punctata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Loripes lucinalis</i>	3
<i>Pleurobranchus</i>	9	<i>Lucinoma borealis</i>	2, 3, 5, 6, 7
<i>membranaceus</i>		<i>Thyasira</i> sp.	7
<i>Berthella plumula</i>	1	<i>Thyasira flexuosa</i>	2, 3, 5, 7, 10
<i>Tritonia hombergii</i>	4, 5, 8	<i>Semierycina nitida</i>	5
<i>Dendronotus frondosus</i>	6	<i>Kellia suborbicularis</i>	5, 7
<i>Doto</i> sp.	1, 7, 9	<i>Devonia perrieri</i>	3
<i>Doto coronata</i>	9	<i>Mysella bidentata</i>	2, 3, 5, 6, 7
<i>Doto dunnei</i>	7	<i>Tellimya ferruginosa</i>	3, 5
<i>Doto fragilis</i>	5	<i>Lepton squamosum</i>	3
<i>Goniodoris castanea</i>	1	<i>Astarte sulcata</i>	5
<i>Goniodoris nodosa</i>	2, 7	<i>Goodallia triangularis</i>	7, 9
<i>Acanthodoris pilosa</i>	3, 4	<i>Tridonta elliptica</i>	7
<i>Onchidoris</i> sp.	4	<i>Tridonta montagui</i>	5
<i>Onchidoris bilamellata</i>	1, 2, 3, 5	<i>Acanthocardia echinata</i>	3, 5
<i>Onchidoris muricata</i>	7	<i>Parvicardium</i> sp.	3
<i>Diaphorodoris luteocincta</i>	3, 5	<i>Parvicardium exiguum</i>	7
<i>Aegires punctilucens</i>	3	<i>Parvicardium ovale</i>	3, 5, 7
<i>Limacia clavigera</i>	3, 4, 8	<i>Parvicardium scabrum</i>	3, 5, 7, 9
<i>Polycera faeroensis</i>	4, 8	<i>Laevicardium crassum</i>	9
<i>Polycera quadrilineata</i>	8, 9	<i>Cerastoderma edule</i>	2, 3, 5, 6, 7, 10
<i>Cadlina laevis</i>	1, 2, 3, 4, 6, 7, 8, 10	<i>Mactra stultorum</i>	5
<i>Rostanga rubra</i>	4	<i>Spisula elliptica</i>	2, 3
<i>Archidoris pseudoargus</i>	1, 4, 6	<i>Spisula solida</i>	5
<i>Janolus cristatus</i>	4, 5, 8	<i>Spisula subtruncata</i>	2, 7
<i>Coryphella lineata</i>	6	<i>Lutraria</i> sp.	5, 9
<i>Flabellina pedata</i>	4, 5	<i>Lutraria lutraria</i>	6
<i>Cuthona</i> sp.	7	<i>Ensis</i> sp.	1, 3, 5, 6, 7, 8, 9, 10
<i>Cuthona amoena</i>	4	<i>Ensis arcuatus</i>	1, 2, 3, 5, 6, 7, 9
<i>Cuthona caerulea</i>	5	<i>Ensis ensis</i>	2, 8
<i>Tergipes tergipes</i>	8	<i>Ensis siliqua</i>	6, 8
<i>Embletonia pulchra</i>	5, 7	<i>Phaxas pellucidus</i>	1, 3, 5, 7
<i>Eubranchius tricolor</i>	6, 1	<i>Angulus tenuis</i>	1, 3, 7, 9
<i>Facelina bostoniensis</i>	3, 5, 6	<i>Arcopagia crassa</i>	3
<i>Favorinus blianus</i>	4	<i>Fabulina fabula</i>	2, 3, 5, 7, 9
<i>Favorinus branchialis</i>	4, 5	<i>Moerella pygmaea</i>	2, 3, 5, 7
<i>Aeolidia</i> sp.	3	<i>Macoma balthica</i>	7
<i>Aeolidia papillosa</i>	4, 8	<i>Gari</i> sp.	5, 7
<i>Aeolidiella alderi</i>	4	<i>Gari fervensis</i>	1, 3, 5, 6
<i>Antalis entalis</i>	3	<i>Gari tellinella</i>	3, 5, 7
<i>Nucula</i> sp.	3, 7	<i>Abra</i> sp.	3
<i>Nucula nucleus</i>	5	<i>Abra alba</i>	2, 3, 5, 7, 9
<i>Mytilidae</i> indet.	8	<i>Abra nitida</i>	2, 5, 7

<i>Abra prismatica</i>	2, 5	<i>Membranipora</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Arctica islandica</i>	2, 3, 5, 8	<i>membranacea</i>	
<i>Venus</i> sp.	3	<i>Electra</i> sp.	8
<i>Venus verrucosa</i>	3, 7, 8	<i>Electra pilosa</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Circomphalus casina</i>	3, 5, 6, 7, 9, 10	<i>Flustra foliacea</i>	1, 2, 4, 5, 6, 7, 8, 9, 10
<i>Gouldia minima</i>	3	<i>Securiflustra securifrons</i>	1, 4, 5, 6, 7, 8, 9
<i>Dosinia</i> sp.	5, 7	<i>Callopora dumerilii</i>	5, 7
<i>Dosinia lupinus</i>	1, 2, 6	<i>Callopora lineata</i>	7
<i>Dosinia exoleta</i>	1, 3, 6, 9	<i>Alderina imbellis</i>	5
<i>Tapes</i> sp.	5	<i>Amphiblestrum flemingii</i>	7
<i>Tapes rhomboides</i>	1, 2, 3, 5, 6, 9, 10	<i>Cellaria fistulosa</i>	9
<i>Venerupis</i> sp.	3	<i>Scrupocellaria</i> sp.	1, 3, 5, 10
<i>Venerupis senegalensis</i>	5, 7	<i>Scrupocellaria reptans</i>	1, 4, 5, 6, 7, 9
<i>Chamelea gallina</i>	1, 3, 5, 6, 7, 9, 10	<i>Scrupocellaria scruposa</i>	2, 3, 4, 5, 9, 10
<i>Clausinella fasciata</i>	1, 3, 5, 6, 7, 9, 10	<i>Bicelliariella ciliata</i>	4, 5, 6, 9, 10
<i>Timoclea ovata</i>	3, 5, 7	<i>Beania mirabilis</i>	5
<i>Turtonia minuta</i>	1, 3, 7	<i>Bugula</i> sp.	7
<i>Mya</i> sp.	3	<i>Bugula flabellata</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Mya truncata</i>	3, 5, 6, 7, 9	<i>Bugula plumosa</i>	6
<i>Mya arenaria</i>	3, 5, 8	<i>Bugula turbinata</i>	5, 6, 9, 10
<i>Corbula gibba</i>	3, 7	<i>Bryozoa</i> indet. (crusts)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Hiatella arctica</i>	1, 3, 4, 5, 6, 7, 9, 10		
<i>Thracia</i> sp.	3, 5, 7	Phoronida	
<i>Thracia convexa</i>	3	<i>Phoronis</i> sp.	3, 5, 7
<i>Thracia phaseolina</i>	3	<i>Phoronis muelleri</i>	6
<i>Thracia villosiuscula</i>	1, 2, 3, 6, 9, 10		
<i>Cochlodesma praetenuae</i>	1, 2, 3, 5, 6, 7	Echinodermata	
<i>Sepioloa atlantica</i>	1, 5, 8, 10	<i>Antedon</i> sp.	8
<i>Eledone cirrhosa</i>	5, 7	<i>Antedon bifida</i>	1, 2, 3, 4, 5, 6, 7, 8, 10
		<i>Antedon petasus</i>	3, 10
Bryozoa		<i>Astropecten irregularis</i>	5, 9
Crisiidae indet.	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Luidia ciliaris</i>	3, 4, 5, 6, 8, 10
<i>Crisidia cornuta</i>	4, 5, 7, 9	<i>Porania pulvillus</i>	3, 4, 5, 6, 8
<i>Crisia</i> sp.	5, 6, 7, 8, 9	<i>Asterina gibbosa</i>	10
<i>Crisia denticulata</i>	4	<i>Solaster endeca</i>	3, 4, 5, 8, 9, 10
<i>Crisia eburnea</i>	1, 2, 4, 9	<i>Crossaster papposus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Tubulipora</i> sp.	5, 7	<i>Henricia</i> sp.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Plagioecia patina</i>	7	<i>Henricia oculata</i>	3, 4, 5, 6, 8
<i>Disporella hispida</i>	5, 8, 9	<i>Henricia sanguinolenta</i>	4, 5, 7, 8, 10
<i>Alcyonidium</i> sp.	7, 8	<i>Stichastrella rosea</i>	3, 4, 8
<i>Alcyonidium diaphanum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Asterias rubens</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Alcyonidium gelatinosum</i>	1, 3, 7, 8, 9, 10	<i>Leptasterias muelleri</i>	1, 4, 7
<i>Alcyonidium hirsutum</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Marthasterias glacialis</i>	2, 3, 4, 6, 7, 8, 9, 10
<i>Alcyonidium mytili</i>	1	<i>Ophiuroidea</i> indet.	2, 3, 5, 6, 7
<i>Flustrellidra hispida</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Ophiothrix fragilis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Bowerbankia imbricata</i>	3	<i>Ophiocolina nigra</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Cribrilina punctata</i>	5, 7	<i>Ophiactis balli</i>	2, 3, 4, 6, 8, 10
<i>Umbonula littoralis</i>	4, 5, 7, 9	<i>Ophiopholis aculeata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Escharoides coccinea</i>	4, 5, 7, 9	<i>Amphiuridae</i> indet.	5
<i>Escharoides mamillata</i>	5	<i>Amphiura</i> sp.	8
<i>Parasmittina</i> sp.	6	<i>Amphiura brachiata</i>	5
<i>Parasmittina trispinosa</i>	1, 3, 4, 5, 6, 9, 10	<i>Amphiura chiajei</i>	3
<i>Porella compressa</i>	4	<i>Amphiura filiformis</i>	3, 6, 7
<i>Escharella immersa</i>	5, 7	<i>Amphiura chiajeifiliformis</i>	5, 6, 7
<i>Escharella ventricosa</i>	5, 7	<i>Amphipholis squamata</i>	1, 2, 3, 4, 5, 6, 7, 9
<i>Schizomavella auriculata</i>	5, 7	<i>Ophiura</i> sp.	8
<i>Schizomavella linearis</i>	4	<i>Ophiura affinis</i>	7
<i>Phaeostachys spinifera</i>	7	<i>Ophiura albida</i>	1, 3, 4, 5, 7, 9, 10
<i>Microporella ciliata</i>	5, 7	<i>Ophiura ophiura</i>	2, 5, 6, 7, 8
<i>Fenestrulina malusii</i>	5, 7	<i>Psammechinus miliaris</i>	3, 4, 5, 6, 7, 8, 9
<i>Chorizopora brongniartii</i>	5	<i>Echinidae</i> indet.	5
<i>Hippothoa divaricata</i>	7	<i>Echinus esculentus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Cellepora pumicosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Echinocyamus pusillus</i>	4, 5
<i>Celleporina hassallii</i>	7	<i>Echinocardium cordatum</i>	2, 3, 5, 6
<i>Aetea truncata</i>	5, 7	<i>Holothuriidae</i> indet.	7
<i>Eucratea loricata</i>	5, 7	<i>Cucumariidae</i> indet.	5

<i>Cucumaria frondosa</i>	5	<i>Pollachius virens</i>	1, 2, 3, 4, 6, 7, 8, 9, 10
<i>Leptopentacta elongata</i>	3	<i>Trisopterus luscus</i>	8
<i>Pawsonia saxicola</i>	4, 7, 8	<i>Trisopterus minutus</i>	3, 7, 8, 10
<i>Ocnus lacteus</i>	4	<i>Gasterosteus aculeatus</i>	1, 7, 10
<i>Ocnus planci</i>	7	<i>Spinachia spinachia</i>	7, 10
<i>Neopentadactyla mixta</i>	5, 6, 7, 8, 9, 10	Syngnathidae indet.	8
<i>Leptosynapta inhaerens</i>	2, 3, 6, 7	<i>Nerophis lumbriciformis</i>	7
Tunicata		<i>Syngnathus acus</i>	5
<i>Clavelina lepadiformis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Scorpaena scrofa</i>	5, 8
Polyclinidae indet.	1, 4, 5, 7	<i>Myxocephalus scorpius</i>	1, 4, 5, 6, 7
<i>Polyclinum</i> sp.	6	<i>Taurulus bubalis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Polyclinum aurantium</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Agonus cataphractus</i>	5, 8
<i>Synoicum pulmonaria</i>	4	<i>Cyclopterus lumpus</i>	6, 8
<i>Morchellium argus</i>	1, 6, 8, 9, 10	<i>Liparis</i> sp.	5
<i>Sidnyum</i> sp.	1, 2, 4, 6, 8, 9	<i>Centrolabrus exoletus</i>	9
<i>Sidnyum turbinatum</i>	1, 2, 3, 4, 5, 6, 8, 9, 10	<i>Crenilabrus melops</i>	2, 4
<i>Aplidium</i> sp.	8, 9	<i>Ctenolabrus rupestris</i>	1, 3, 4, 5, 7, 8
<i>Aplidium nordmanni</i>	4, 5, 9, 10	<i>Labrus bergylta</i>	1, 2, 3, 4, 6, 7, 8, 9, 10
<i>Aplidium pallidum</i>	7	<i>Labrus mixtus</i>	2, 3, 4, 8
<i>Aplidium punctum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Lipophrys pholis</i>	5, 6, 7, 9
Didemnidae indet.	1, 2, 4, 5, 6, 7, 8, 9, 10	<i>Parablennius gattorugine</i>	3, 5
<i>Didemnum maculosum</i>	4, 9, 10	<i>Anarhichas lupus</i>	8
<i>Diplosoma</i> sp.	8	<i>Chirolophis ascanii</i>	4, 7, 8
<i>Diplosoma listerianum</i>	1, 2, 6, 7, 9, 10	<i>Lumpenus lumpretaeformis</i>	2, 3
<i>Diplosoma spongiforme</i>	2, 3, 4, 5, 8, 9, 10	<i>Zoarces viviparus</i>	6
<i>Lissoclinum</i> sp.	8	<i>Pholis gunnellus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Lissoclinum perforatum</i>	1, 2, 4, 6, 8, 9	Ammodytidae indet.	8
<i>Ciona intestinalis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Ammodytes</i> sp.	5
<i>Corella parallelogramma</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Ammodytes tobianus</i>	2, 4, 5, 6, 8, 10
<i>Asciella</i> sp.	5	<i>Callionymus lyra</i>	5, 6, 8, 10
<i>Asciella aspersa</i>	1, 2, 3, 5, 7, 8, 9	<i>Callionymus reticulatus</i>	5
<i>Asciella scabra</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	Gobiidae indet.	1
<i>Ascidia</i> sp.	6	<i>Gobiusculus flavescens</i>	1, 2, 3, 5, 6, 7, 8, 10
<i>Ascidia conchilega</i>	1, 3, 4, 5, 7, 9, 10	<i>Pomatoschistus</i> sp.	1, 2, 3, 5, 6, 7, 8, 9
<i>Ascidia mentula</i>	1, 2, 3, 4, 5, 6, 7, 9	<i>Pomatoschistus microps</i>	8
<i>Ascidia virginea</i>	3, 4, 8	<i>Pomatoschistus minutus</i>	2, 3, 5, 7, 8, 9, 10
Styelidae indet.	5	<i>Pomatoschistus pictus</i>	3, 5, 8, 9
<i>Polycarpa fibrosa</i>	5, 7	<i>Thorogobius ephippiatus</i>	3, 7, 8
<i>Polycarpa pomaria</i>	3, 4	<i>Phrynorhombus norvegicus</i>	6, 8
<i>Polycarpa scuba</i>	4, 6, 7	<i>Phrynorhombus regius</i>	7
<i>Dendrodoa</i> sp.	3	<i>Scophthalmus rhombus</i>	1
<i>Dendrodoa grossularia</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Zeugopterus punctatus</i>	8
<i>Botryllus schlosseri</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Pleuronectidae indet.	1, 2, 3, 5, 6, 7, 8, 10
<i>Botrylloides leachi</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Limanda limanda</i>	8
<i>Boltenia echinata</i>	1, 3, 4, 5	<i>Pleuronectes platessa</i>	3, 5, 6, 8, 10
<i>Molgula</i> sp.	2, 6, 8	<i>Solea solea</i>	8
<i>Molgula citrina</i>	4	Cyanophycota	
<i>Molgula manhattensis</i>	1, 4	<i>Beggiatoa</i> sp.	1, 2
<i>Molgula occulta</i>	8	Blue-green algae indet.	1, 4, 6, 7, 9, 10
Pisces		Rhodophycota	
<i>Scyliorhinus canicula</i>	7, 8, 9, 10	<i>Porphyropsis coccinea</i>	1, 3, 5, 6, 7, 9, 10
Osteichthyes indet.	6, 10	<i>Porphyra</i> sp.	1, 2, 3, 4, 5, 6, 7, 9
<i>Anguilla anguilla</i>	7	<i>Porphyra amethystea</i>	9
<i>Diplecogaster bimaculata</i>	1, 3, 5	<i>Porphyra linearis</i>	2, 4, 5, 6, 10
<i>Lepadogaster</i> sp.	3, 5, 7	<i>Porphyra miniata</i>	5
<i>Lepadogaster lepadogaster</i>	3	<i>Porphyra purpurea</i>	4, 10
Gadidae indet.	8	<i>Porphyra umbilicalis</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Ciliata mustela</i>	8	<i>Audouinella</i> sp.	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Gadus morhua</i>	2, 3, 4, 6, 7, 8, 10	<i>Audouinella parvula</i>	7
<i>Gaidropsarus vulgaris</i>	8	<i>Rhodothamniella floridula</i>	3
<i>Merlangius merlangus</i>	8	Nemaliales indet.	6
<i>Molva molva</i>	8	<i>Helminthora divaricata</i>	7
<i>Pollachius</i> sp.	6	<i>Scinaia</i> sp.	5, 9, 10
<i>Pollachius pollachius</i>	1, 8, 9	<i>Asparagopsis armata</i>	1, 7, 9, 10

<i>Bonnemaisonia</i>	1, 2, 3, 5, 6, 7, 9, 10	<i>Rhodymenia</i>	1, 2, 7
<i>asparagoides</i>		<i>pseudopalmata</i>	
<i>Bonnemaisonia hamifera</i>	3, 6, 7, 8, 9, 10	<i>Rhodymenia ardissoni</i>	1
<i>Trailliella intricata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Chylocladia verticillata</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Gelidium latifolium</i>	3	<i>Gastroclonium ovatum</i>	5
<i>Gelidium pusillum</i>	1, 3, 4, 5, 6, 7, 9	<i>Lomentaria articulata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Palmaria palmata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Lomentaria clavellosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Dilsea carnosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Lomentaria orcadensis</i>	1, 2, 3, 4, 6, 9, 10
<i>Dudresnaya verticillata</i>	10	<i>Antithamnion</i> sp.	5
<i>Dumontia contorta</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Antithamnion cruciatum</i>	9
<i>Callophyllis</i> sp.	8	<i>Aglaothamnion</i> sp.	3, 4, 5, 9, 10
<i>Callophyllis cristata</i>	1, 5, 6, 7, 10	<i>Callithamnion</i> sp.	2, 5, 6
<i>Callophyllis laciniata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Aglaothamnion byssoides</i>	1, 3, 5, 10
<i>Kallymenia</i> sp.	1	<i>Callithamnion corymbosum</i>	3, 7
<i>Kallymenia reniformis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Callithamnion granulatum</i>	4, 6
<i>Gloiosiphonia capillariss</i>	7	<i>Aglaothamnion sepositum</i>	4, 9, 10
<i>Peyssonnelia</i> sp.	3, 4, 6, 7, 10	<i>Callithamnion tetragonum</i>	4, 9, 10
<i>Peyssonnelia immersa</i>	4	<i>Callithamnion</i> sp. (spongy)	6
<i>Hildenbrandia</i> sp.	5, 9, 10	<i>Ceramium</i> sp.	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Hildenbrandia rubra</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Ceramium pallidum</i>	1, 3, 4, 6, 7, 9, 10
Corallinaceae indet. (crusts)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Ceramium botryocarpum</i>	4
<i>Corallina officinalis</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Ceramium ciliatum</i>	2, 9
<i>Dermatolithon adplicitum</i>	9	<i>Ceramium cimbricum</i>	3
<i>Lithophyllum crouanii</i>	9	<i>Ceramium deslongchampii</i>	4, 5
<i>Lithophyllum orbiculatum</i>	9	<i>Ceramium diaphanum</i>	3, 10
<i>Lithothamnion</i> sp.	8	<i>Ceramium echionotum</i>	1, 7, 9
<i>Lithothamnion glaciale</i>	1, 3, 5, 6, 7, 9, 10	<i>Ceramium nodulosum</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Lithothamnion sonderi</i>	9	<i>Ceramium pallidum</i>	3, 4, 9
<i>Melobesia membranacea</i>	9	<i>Ceramium secundatum</i>	3, 7
<i>Phymatolithon calcareum</i>	1, 2, 3, 5, 6, 7, 8, 9	<i>Ceramium</i>	1, 2, 3, 4, 6, 9, 10
<i>Phymatolithon laevigatum</i>	1, 9	<i>shuttleworthianum</i>	
<i>Phymatolithon lenormandii</i>	1, 9, 10	<i>Ceramium botryocarpum</i>	2
<i>Phymatolithon purpureum</i>	1, 9, 10	<i>Compsothamnion thuyoides</i>	1, 3, 9, 10
<i>Titanoderma</i> sp.	9	<i>Griffithsia corallinoides</i>	3, 5, 6, 7
<i>Titanoderma pustulatum</i>	1, 9	<i>Halurus flosculosus</i>	1, 2, 3, 5, 6, 7, 9, 10
Maeri indet.	2, 5, 6, 7, 9	<i>Halurus equisetifolius</i>	2, 10
Gigartinales indet.	6	<i>Plumaria plumosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Gracilaria gracilis</i>	7	<i>Pterothamnion plumula</i>	1, 3, 4, 5, 6, 9, 10
<i>Ahnfeltia plicata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Ptilota gunneri</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Phyllophora crispa</i>	1, 3, 4, 5, 6, 7, 9, 10	<i>Ptilothamnion pluma</i>	8
<i>Phyllophora</i>	1, 3, 4, 5, 6, 7, 9, 10	<i>Seirospora interrupta</i>	3
<i>pseudoceranoides</i>		<i>Spermothamnion repens</i>	10
<i>Erythrodermis traillii</i>	6, 10	<i>Acrosorium reptans</i>	6, 7, 10
<i>Coccotylus truncata</i>	4, 6, 7	<i>Acrosorium venulosum</i>	1, 9, 10
<i>Schottera nicaeensis</i>	1, 3, 4, 6, 9, 10	<i>Apoglossum ruscifolium</i>	1, 4, 5, 6, 7, 9, 10
<i>Mastocarpus stellatus</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Cryptopleura ramosa</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Mastocarpus stellatus</i>	6	<i>Delesseria sanguinea</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
(Petrocelis)		<i>Drachiella spectabilis</i>	8
<i>Chondrus crispus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Hypoglossum</i>	1, 2, 4, 5, 6, 7, 9, 10
<i>Polyides rotundus</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>hypoglossoides</i>	
<i>Plocamium cartilagineum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Membranoptera alata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Sphaerococcus</i>	1, 7, 10	<i>Haraldiophyllum</i>	1, 3, 7, 9, 10
<i>coronopifolius</i>		<i>bonnemaisonii</i>	
<i>Furcellaria lumbricalis</i>	1, 2, 3, 5, 7, 9, 10	<i>Nitophyllum punctatum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Halarachnion ligulatum</i>	1, 2, 3, 4, 6, 7, 9, 10	<i>Phycodrys rubens</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Catenella caespitosa</i>	6, 9	<i>Erythroglossum laciniatum</i>	6, 9, 10
<i>Calliblepharis ciliata</i>	7	<i>Heterosiphonia plumosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Cystoclonium purpureum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<i>Brongniartella byssoides</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Rhodophyllis</i> sp.	1, 6, 7	<i>Osmundea hybrida</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Rhodophyllis divaricata</i>	1, 3, 6, 9, 10	<i>Osmundea pinnatifida</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Rhodophyllis divaricata</i>	1, 9, 10	<i>Odonthalia dentata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
var. <i>wernerii</i>		<i>Polysiphonia</i> sp.	1, 3, 4, 5, 6, 7, 9, 10
<i>Cruoria pellita</i>	1, 9	<i>Polysiphonia brodiei</i>	1, 4, 6, 9
<i>Cordylecladia erecta</i>	1, 5, 6, 7, 10	<i>Polysiphonia elongata</i>	1, 3, 6, 7, 9, 10
		<i>Polysiphonia elongella</i>	3, 10

<i>Polysiphonia fibrata</i>	3, 7
<i>Polysiphonia fibrillosa</i>	1, 3, 9
<i>Polysiphonia lanosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Polysiphonia nigra</i>	3, 10
<i>Polysiphonia fucoides</i>	1, 3, 4, 5, 6, 7, 9, 10
<i>Polysiphonia simulans</i>	3
<i>Polysiphonia stricta</i>	1, 3, 4, 6, 9
<i>Pterosiphonia parasitica</i>	1, 2, 3, 6, 7, 9, 10
<i>Rhodomela confervoides</i>	1, 3, 5, 6, 7, 9, 10
<i>Rhodomela lycopodioides</i>	3, 5, 10
Filamentous red algae indet.	3, 4, 5, 6, 7
Foliose red algae indet.	1, 3, 6, 8
Rhodophycota indet. (non-calc. crusts)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Chrysophycota

Diatoms - colonial	1, 3, 6, 7, 10
Diatoms - film	3, 5, 7, 10

Chromophycota

Ectocarpaceae indet.	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Ectocarpus</i> sp.	6, 8
<i>Ectocarpus siliculosus</i>	6, 1
<i>Spongonema tomentosum</i>	1, 2, 3, 4, 6, 7, 9, 10
<i>Pseudolithoderma extensum</i>	1, 4, 7, 9
<i>Ralfsia</i> sp.	5, 6
<i>Ralfsia verrucosa</i>	1, 9
<i>Elachista</i> sp.	1, 3, 4, 5, 6, 7, 9, 10
<i>Elachista fucicola</i>	1, 2, 3, 4, 5, 7, 9, 10
<i>Leathesia difformis</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Stilophora</i> sp.	5
<i>Stilophora tenella</i>	3
<i>Chordaria</i> sp.	6
<i>Chordaria flagelliformis</i>	1, 2, 6, 9, 10
<i>Eudesme</i> sp.	2, 3, 5, 6, 7
<i>Eudesme virescens</i>	1, 3, 5, 6, 7, 9, 10
<i>Mesogloia vermiculata</i>	3, 6, 10
<i>Cutleria multifida</i>	1, 3, 5, 7
<i>Aglaozonia</i> (asexual <i>Cutleria</i>)	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Sphacelaria</i> sp.	1, 3, 6, 7, 9, 10
<i>Sphacelaria cirrosa</i>	1
<i>Sphacelaria fusca</i>	1, 9
<i>Sphacelaria plumosa</i>	3
<i>Sphacelaria plumula</i>	9
<i>Cladostephus spongiosus</i>	1, 2, 3, 5, 7, 9, 10
<i>Dictyota dichotoma</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Sporochnus pedunculatus</i>	7
<i>Desmarestia</i> sp.	1, 5, 6, 9
<i>Desmarestia aculeata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Desmarestia dresnayi</i>	10
<i>Desmarestia ligulata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Desmarestia viridis</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Arthrocladia villosa</i>	2, 7
<i>Stictyosiphon</i> sp.	7
<i>Striaria attenuata</i>	3
<i>Asperococcus</i> sp.	1, 2, 3, 5, 6, 7, 9
<i>Asperococcus compressus</i>	6
<i>Asperococcus fistulosus</i>	1, 2, 3, 5, 6, 7, 9, 10
<i>Punctaria</i> sp.	3
<i>Punctaria tenuissima</i>	3
<i>Dictyosiphon</i> sp.	2, 5
<i>Colpomenia peregrina</i>	6, 10
<i>Petalonia fascia</i>	1, 4, 9
<i>Scytosiphon lomentaria</i>	1, 2, 4, 6
<i>Chorda filum</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

<i>Laminaria</i> sp.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Laminaria digitata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Laminaria hyperborea</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Laminaria saccharina</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Saccorhiza polyschides</i>	1, 2, 3, 5, 6, 7, 8, 9, 10
<i>Alaria esculenta</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Ascophyllum nodosum</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Fucus</i> sp.	1, 6, 7, 10
<i>Fucus distichus</i>	4, 6
<i>Fucus serratus</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Fucus spiralis</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Fucus vesiculosus</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Pelvetia canaliculata</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Himantalia elongata</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Halidrys siliquosa</i>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Filamentous brown algae indet.	3, 6, 10
Chromophycota indet. (crusts)	1, 2, 3, 4, 6, 7, 9, 10
Foliose brown algae indet.	3

Chlorophycota

<i>Ulothrix</i> sp.	4
<i>Pseudoclonium</i>	7
<i>Enteromorpha</i> sp.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Enteromorpha intestinalis</i>	4, 10
<i>Enteromorpha prolifera</i>	5
<i>Ulva</i> sp.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<i>Ulva lactuca</i>	5, 8, 10
<i>Blidingia minima</i>	9
<i>Monostroma oxyspermum</i>	7
<i>Prasiola stipitata</i>	1, 4, 6, 9, 10
<i>Urospora</i> sp.	4
<i>Spongomorpha</i> sp.	1, 2, 4, 6, 7, 9, 10
<i>Spongomorpha aeruginosa</i>	1, 9
<i>Spongomorpha arcta</i>	4, 10
<i>Chaetomorpha</i> sp.	1, 9
<i>Chaetomorpha linum</i>	1, 2, 4, 7, 8, 9, 10
<i>Chaetomorpha melagonium</i>	1, 2, 3, 4, 6, 7, 9, 10
<i>Cladophora</i> sp.	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Cladophora albida</i>	3
<i>Cladophora rupestris</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Cladophora sericea</i>	5, 9, 10
<i>Bryopsis plumosa</i>	1, 2, 3, 4, 5, 6, 9, 10
<i>Derbesia</i> sp.	5, 9, 10
<i>Derbesia marina</i>	7, 9
<i>Derbesia marina</i> (<i>Halicystis</i>)	6, 10
<i>Ostreobium quekettii</i>	1, 9
<i>Codium</i> sp.	1, 2, 3, 5, 6, 7, 9, 10
<i>Codium fragile</i>	9
<i>Codium fragile</i> subsp. <i>atlanticum</i>	7
<i>Codium fragile</i> subsp. <i>tomentosoides</i>	1, 6, 7, 9
Encrusting green algae indet.	4, 7, 9
Filamentous green algae indet.	1, 2, 3, 4, 5, 7, 9
Foliose green algae indet.	3

Angiospermae

<i>Zostera</i> sp.	2, 7
<i>Zostera marina</i>	1, 2, 5, 6, 7, 8, 10
<i>Armeria maritima</i>	1, 2, 3, 5, 6, 7, 9

Lichens

<i>Arthropyrenia halodytes</i>	7	<i>Lichina pygmaea</i>	1, 2, 3, 4, 6, 9
<i>Caloplaca</i> sp.	4	<i>Ochrolechia parella</i>	2
<i>Caloplaca marina</i>	1, 2, 3, 4, 5, 6, 7, 9, 10	<i>Ramalina</i> sp.	1, 2, 3, 4, 6, 7, 9
<i>Caloplaca thallicola</i>	1, 2, 4, 6, 7, 9, 10	<i>Verrucaria</i> sp.	2, 6, 7
<i>Lecanora</i> sp.	2, 4, 7	<i>Verrucaria maura</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Lecanora atra</i>	1, 2, 3, 4, 5, 6, 7, 9	<i>Verrucaria mucosa</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Lecanora rupicola</i>	7	<i>Xanthoria parietina</i>	1, 2, 3, 4, 5, 6, 7, 9, 10
<i>Lichina confinis</i>	1, 4, 6, 9, 10	Grey lichens indet.	1, 2, 3, 4, 5, 6, 7, 9, 10

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