

Castle Ground recommended MCZ

Seasearch Site Surveys 2012

This report summarises the results of surveys carried out in the recommended Marine Conservation Zone by Seasearch divers and snorkelers between March and October 2012. The aim of the surveys was to add detail of the habitats and species found within and adjacent to the rMCZ to support the designation process and inform management.



Area of rMCZ NG10 Castle Ground showing sites surveyed by Seasearch in 2012

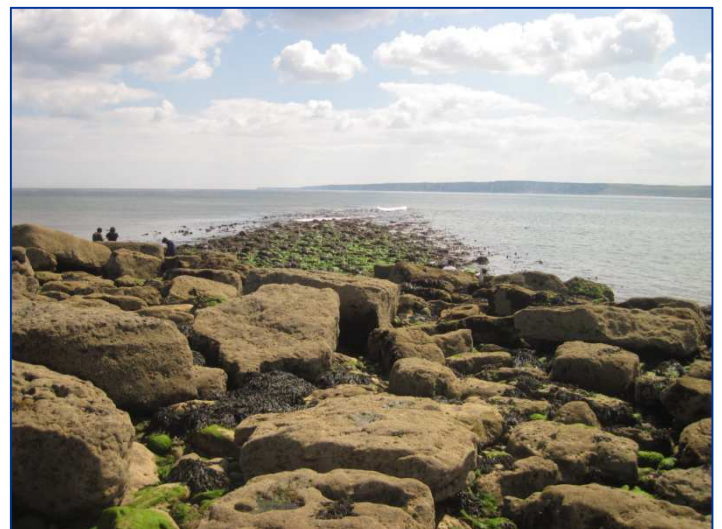
Physical Features of the Area

Named after its prominent feature, Scarborough Castle (photo below), this site runs from Scalby Mills in the north to the southern side of Filey Brigg in the South.



It is a long narrow site, proposed for its mosaic of intertidal habitats, including sand, mud, coarse sediments and rocky shores ranging from sheltered bays to exposed headlands.

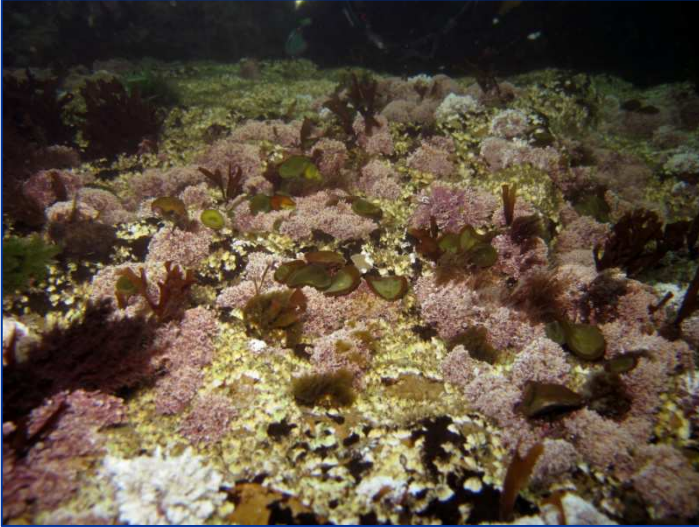
The intertidal sediments are an important foraging area for seabird species including kittiwakes, turnstones and purple sandpipers, while the rocky shores support a great diversity of flora and fauna. Intertidal underboulder communities, such as the Spittals at Filey (photo below) are a habitat of particular conservation importance for protection within the site.



Features of the Marine Life

The sites surveyed were a mixture of bedrock ridges and boulder reefs in the intertidal and shallow subtidal zone.

Most of the habitats recorded were seaweed-dominated, ranging from a short turf of coralline algae and pepper dulse in the upper intertidal zone to kelp forest and kelp park with an understory of red and brown seaweeds.



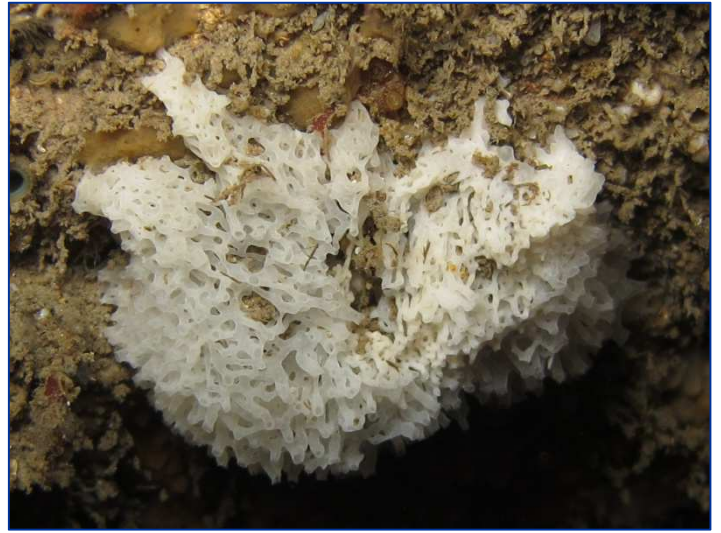
Upper intertidal bedrock reef dominated by coralline algae and thongweed at Casty Rocks



Brown fan weed, Desmarest's flattened weed and cock's comb at Calf Allen Rocks

The kelp supports a rich variety of epiphytic seaweeds, as well as colonial hydroids, bryozoans and sea squirts. Urchins were recorded at most sites but there was no evidence of overgrazing of the kelp habitats.

The sites were also rich in sessile fauna such as sponges, anemones and hydroids, particularly in areas where surge gullies were formed between boulders or bedrock ridges, or on the underside of boulders and overhangs (see photos opposite).



White lace sponge in a surge gully at Casty Rocks



Plumose anemones on an intertidal boulder on the south side of Filey Brigg



Chimney sponge on a gully wall on the north side of Filey Brigg

The reefs provide habitat for many fish species, and many of the sites are well known to local anglers. Large pollack and ballan wrasse were commonly recorded amongst kelp forest during the survey. The reefs also provide valuable breeding and nursery habitat; in June and July, male lumpsuckers were frequently observed guarding eggs.



Male lump sucker guarding eggs at Calf Allen Rocks

Other fish species recorded on the reefs included butterflyfish, long-spined sea scorpion, Yarrell's blenny and lemon sole.



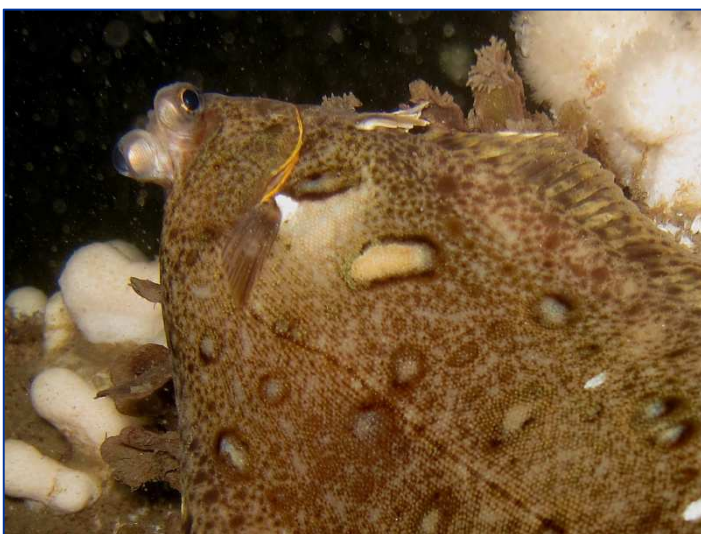
Crystal sea slug at Castle Rocks, south of Cayton Bay.



Yarrells blenny at Perilous Rocks



The nudibranch *Aeolidiella glauca* feeding on dahlia anemones on the north side of Filey Brigg



Lemon sole at Perilous Rocks

Many species of mollusc were recorded on the reefs (see photos opposite). Filey Brigg in particular was an interesting site for nudibranchs, with seven species recorded in one dive. Crystal sea slugs were observed spawning in large numbers at several sites in late June and early July.



The nudibranch *Polycera quadrilineata* on a kelp frond at Calf Allen Rocks



The nudibranch *Facelina auriculata* at Calf Allen Rocks

Crustaceans were common at all the sites, especially at the aptly named 'Crab Hole' south of Filey Brigg. Species commonly recorded included edible crab, shore crab, velvet swimming crab and common lobster.



Shore crabs mating at 'Crab Hole' Filey Brigg

The reefs are surrounded by extensive areas of sand or coarse sediment. This habitat was also surveyed at a few sites, and found to support several species including masked crabs, harbour crabs, brown shrimp, dragonets, sand mason worms and lug worms.



Masked crab on intertidal sand in Cayton Bay

Marine mammals were also recorded during the surveys. Grey seals were observed at Old Horse Rocks, Filey Brigg, Red Cliff and Casty Rocks, and harbour porpoises were observed just north of Scarborough harbour in July.

Human uses and impacts

The main uses of the area are potting for crabs and lobsters, and sea angling from the shore and boats.

Lead sinkers, lures, line and hooks were commonly found throughout the area, although were most abundant at Filey Brigg and the Accropode coastal defences at Scarborough harbour.



Lead sinkers at Filey Brigg

Lobster potting was observed from the surface during most dives, and abandoned lobster pots were recorded underwater at Casty Rocks, Filey Brigg, Castle Rocks, Red Cliff and Knipe Point.



Lobster pot with kelp and red seaweeds growing on it at Filey Brigg

The sandy beaches within the proposed MCZ, such as Cayton Bay, are popular with holiday makers, dog walkers and surfers. Scarborough harbour supports fishing and leisure boats.

Benefits of Protection

All of the habitats within this 3.7km² site were deemed to be in favourable condition, so the aim of MCZ designation would be to maintain this condition through responsible management and ongoing monitoring.

It would be beneficial to extend the site boundary seawards to incorporate some of the prominent reefs such as Calf Allen Rocks. These sites are part of the same reef system as the strip of rocky shore proposed for designation, and they support the same types of intertidal habitats, yet they are not currently covered by the proposed rMCZ boundary.

Technical Appendix

This appendix contains more detailed information about the surveys undertaken and records made. It includes:

- Dive details
- Habitat sketches
- Biotope list
- Species list

The data have been entered into Marine Recorder and are available as an MS Access 'snapshot' file on request from Seasearch. Data from surveys up to 2011 are publicly available on the NBN Gateway.

Current Proposal

The boundary is intended to cover the intertidal area down to the mean low water mark. However, it currently excludes areas of intertidal rock that are separated from the main shore, some of which are separated only by a very narrow channel. As the map below shows, Perilous Rocks, Calf Allen Rocks, Castle Rocks, Casty Rocks and Old Horse Rocks are all excluded from the current proposed boundary. The 2012 surveys have shown that these sites are rich in biodiversity and support the same broad scale habitats proposed for designation within rMCZ NG10.



Boundary of the proposed Castle Ground MCZ boundary at Cayton Bay. Source: NBN Gateway © Crown copyright and database rights 2011 Ordnance Survey [100017955]

The features proposed for designation are:

- | | | |
|----------------------|------|-------------------------------------|
| Broad scale habitats | A1.1 | High energy intertidal rock |
| | A1.2 | Moderate energy intertidal rock |
| | A1.3 | Low energy intertidal rock |
| | A2.1 | Intertidal coarse sediment |
| | A2.2 | Intertidal sand and muddy sand |
| | A2.3 | Intertidal mud |
| Habitat FOCI | | Intertidal underboulder communities |

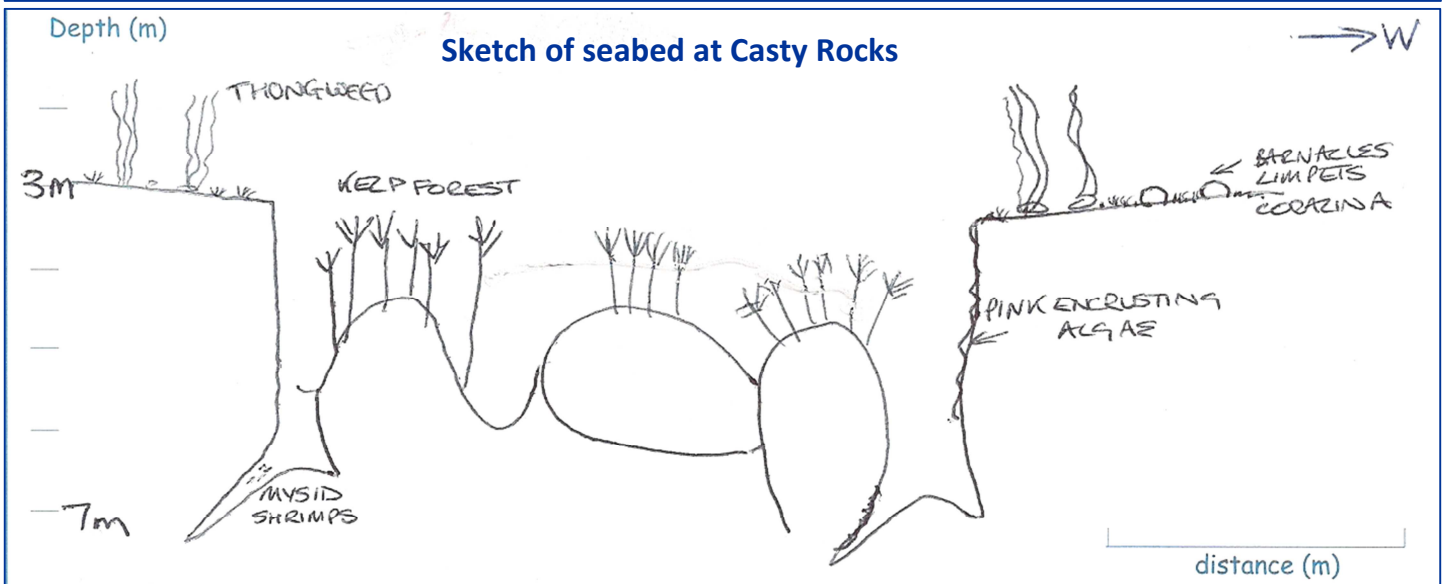
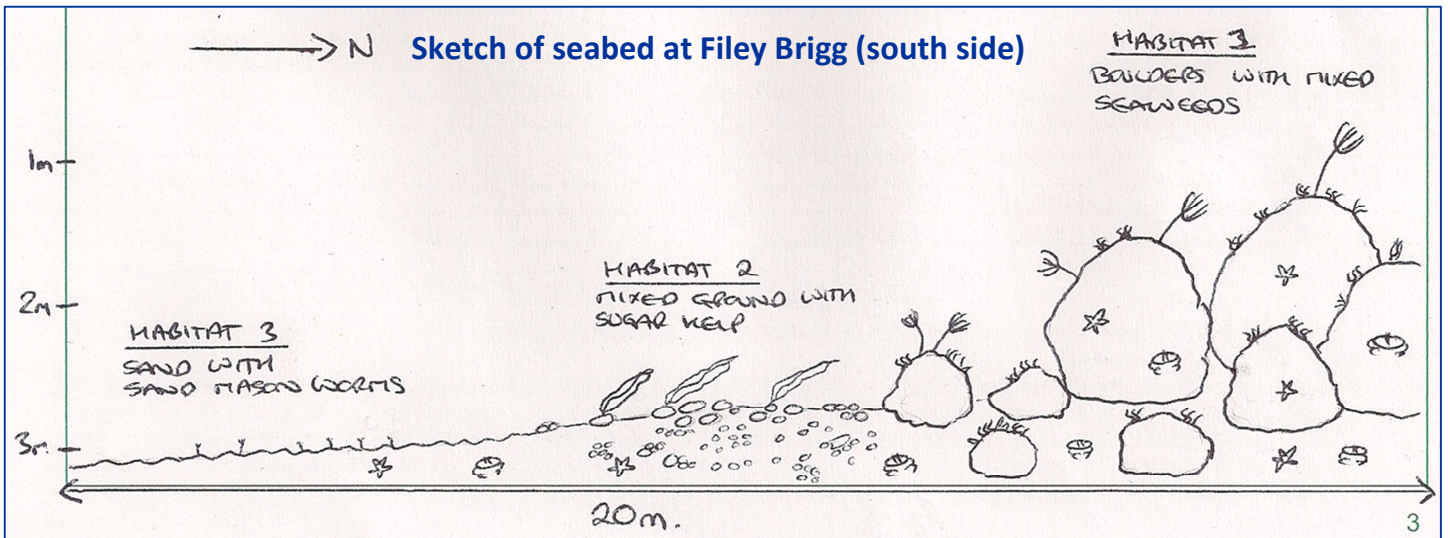
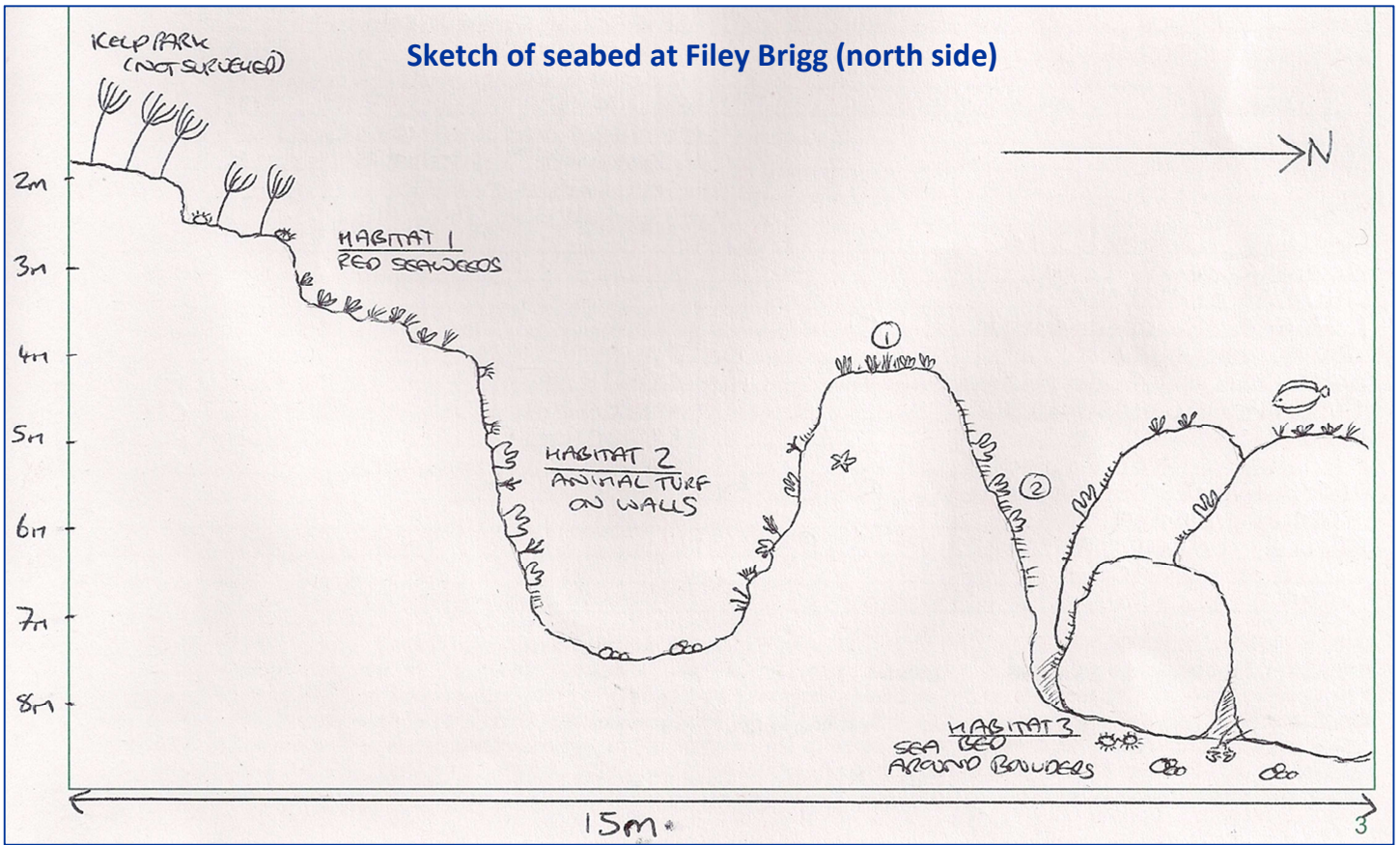
Features within the area but NOT proposed for designation are:

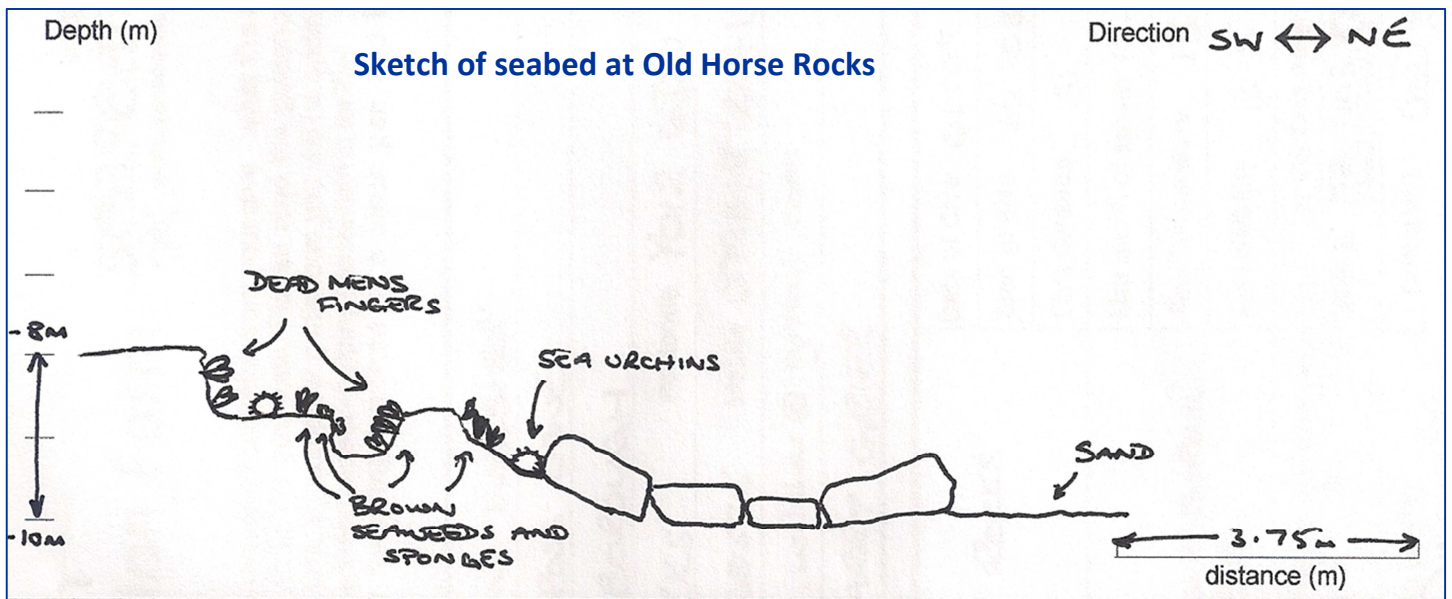
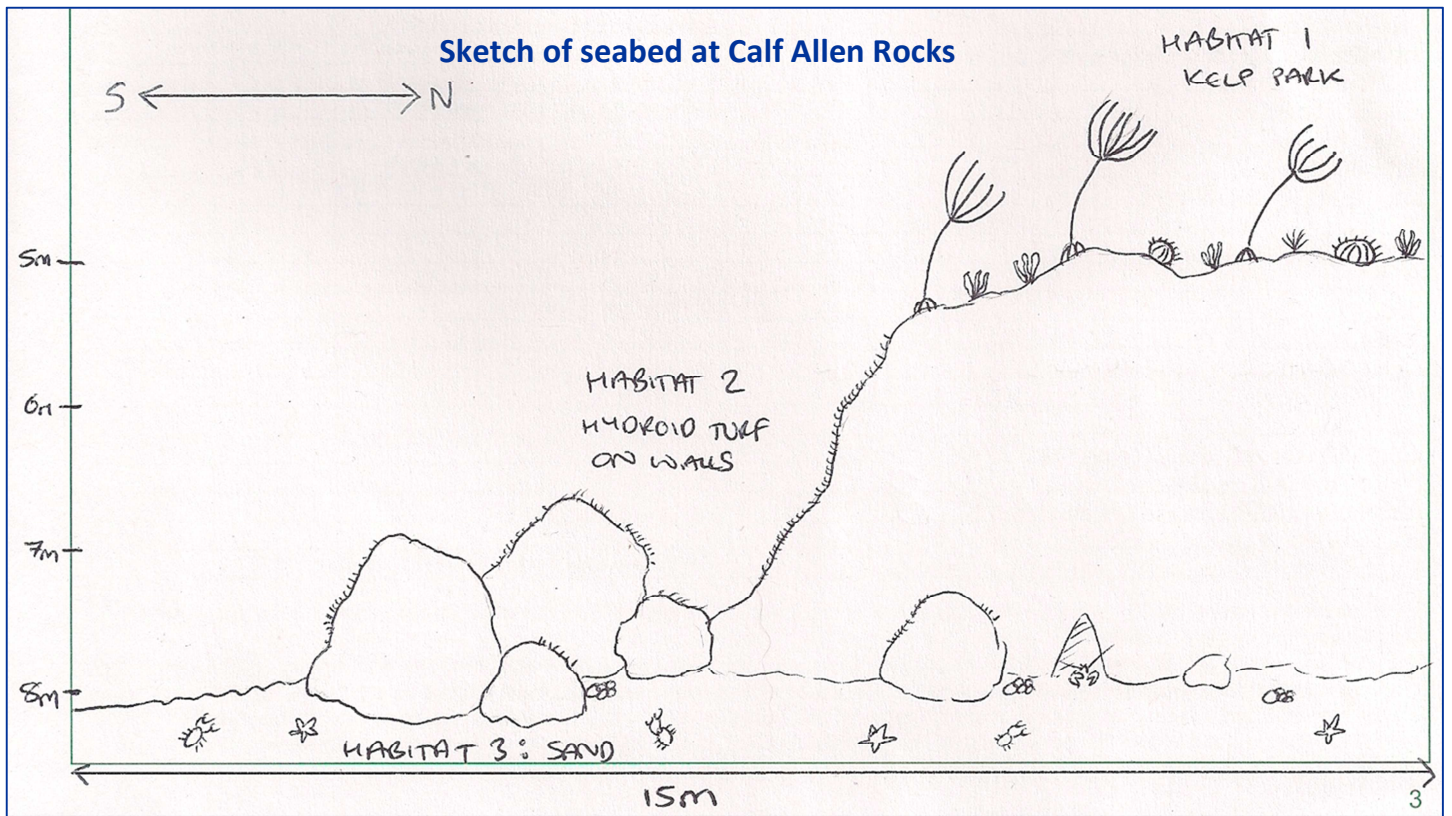
Broad scale habitats	A3.1	High energy infralittoral rock
	A5.2	Subtidal sand
Habitat FOCI		Subtidal sands and gravels
		Littoral chalk communities
		Subtidal chalk
		Blue mussel beds

Dive details

Reef name	Survey dates	Position	Surveyors and Observers	Seasearch form numbers
Accropodes (coastal defences)	1/9/2012	54°17.148n 0°23.038w 54°16.881n 0°23.233w	Paula Lightfoot Haydn Wilsher	NE12/105 (S) NE12/165 (O)
Calf Allen Rocks	18/6/2012 1/9/2012 4/10/2012	54° 14.780n 00° 20.970w 54° 14.752n 00° 21.025w	Paula Lightfoot Peter Bridgewood	NE12/021 (O) NE12/022 (S) NE12/106 (S) NE12/163 (O)
Castle Rocks	19/6/2012	54° 14.640n 00° 19.840w	Anne Morrison, Paula Lightfoot	NE12/023 (O)
Casty Rocks	23/7/2012	54°14.347n 0°19.372w 54°14.235n 0°19.101w	Caroline Pindar, Paula Lightfoot Anne Morrison	NE12/041 (O) NE12/042 (O)
Filey Brigg (north side)	2/7/2012 2/8/2012	54° 13.04n 00° 15.670w 54° 13.050n 00° 15.500w	Paula Lightfoot, Caroline Pindar, Anne Morrison Matt Newsome	NE12/031 (S) NE12/030 (O) NE12/080 (O)
Filey Brigg (south side)	12/7/2012	54° 12.925n 00° 15.664w	Paula Lightfoot, Alan Bellerby	NE12/034 (S)
Gristhorpe Bay	1/8/2012	54° 14.127n 00° 18.647w	Zoe Frank	NE12/096 (O)
Holbeck	10/8/2012	54° 16.126n 00° 23.262w	Matt Newsome	NE12/082 (O)
Knipe Point	17/9/2012	54° 15.460n 00° 21.740w	Anne Morrison	NE12/161 (O)
Red Cliff Rocks	19/6/2012 9/8/2012	54° 14.710n 00° 20.629w	Paula Lightfoot Anne Morrison	NE12/024 (O) NE12/063 (O) NE12/064 (O)
Old Horse Rocks	23/6/2012	54° 14.274n 00° 18.749w	Anne Morrison Haydn Wilsher	NE12/026 (O) NE12/164 (O) NE12/175 (O)
Perilous Rocks	29/3/2012 18/6/2012 21/8/2012	54° 15.725n 00° 22.110w	Paula Lightfoot, Caroline Pindar	NE12/017 (O) NE12/020 (O) NE12/085 (O)
Scalby Ness	17/7/2012	54° 18.828n 00° 24.189w	Paula Lightfoot	NE12/036 (O)

Habitat sketches





Biotores recorded

LR.MLR	Moderate energy littoral rock	Perilous Rocks, Calf Allen Rocks, Red Cliff, Castle Rocks, Casty Rocks, Old Horse Rocks, Scalby Ness
LR.HLR.FR.Coff.Coff	<i>Corallina officinalis</i> and <i>Mastocarpus stellatus</i> on exposed to moderately exposed lower eulittoral rock	Casty Rocks (north)
IR.FIR.SG	Infralittoral surge gullies	Casty Rocks (north)
IR.MIR.KR.Lhyp.Ft	<i>Laminaria hyperborea</i> forest and foliose red seaweeds on moderately exposed upper infralittoral rock	Accropodes, Red Cliff, Casty Rocks (south)
IR.MIR.KR.Lhyp.Pk	<i>Laminaria hyperborea</i> park and foliose red seaweeds on moderately exposed lower infralittoral rock	Filey Brigg (south), Calf Allen Rocks, Red Cliff, Old Horse Rocks
IR.HIR.KFar.FoR	Foliose red seaweeds on exposed lower infralittoral rock	Filey Brigg (north)
IR.HIR.KSed.DesFilR	Dense <i>Desmarestia</i> spp. with filamentous red seaweeds on exposed infralittoral cobbles, pebbles and bedrock	Calf Allen Rocks

IR.MIR.KR.XFoR	Dense foliose red seaweeds on silty moderately exposed infralittoral rock	Accropodes
SS.Smp.KSwSS.LSacR	<i>Laminaria saccharina</i> and red seaweeds on infralittoral sediments	Filey Brigg (south)
SS.SSa	Sublittoral sand	Accropodes, Holbeck, Perilous Rocks, Old Horse Rocks, Castle Rocks, Gristhorpe Bay
SS.SCS.ICS	Infralittoral coarse sediment	Filey Brigg (south), Calf Allen Rocks
CR.HCR.XFa.FluCoAs	<i>Flustra foliacea</i> and other hydroid/bryozoan turf species on slightly scoured circalittoral rock or mixed substrata	Filey Brigg (north)
CR.MCS.EcCr.UrtScr	<i>Urticina felina</i> and sand-tolerant fauna on sand-scoured or covered circalittoral rock	Filey Brigg (north)
CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock	Perilous Rocks, Old Horse Rocks, Castle Rocks, Calf Allen Rocks, Gristhorpe Bay
CR.MCR.CSab	Circalittoral <i>Sabellaria</i> reefs (on rock)	Scalby Ness

Species List

Scientific Name	Common name	Site	Abundance
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Porifera	Sponges		
<i>Clathrina coriacea</i>	White lace sponge	Casty Rocks (north)	R
<i>Leucosolenia</i>	Hedgehog sponge	Calf Allen Rocks, Castle Rocks, Casty Rocks (north), Filey Brigg (north side), Red Cliff	A (Filey), R-O (other sites)
<i>Scypha ciliata</i>	Vase sponge	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Red Cliff	O-C
<i>Grantia compressa</i>	Purse sponge	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Red Cliff	O-C
<i>Polymastia penicillus</i>	Chimney sponge	Filey Brigg (north side) Old Horse Rocks	R-O
<i>Cliona celata</i>	Boring sponge	Castle Rocks, Old Horse Rocks, Red Cliff	O-C
<i>Halichondria panicea</i>	Breadcrumb sponge	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (north and south sides), Knipe Point, Old Horse Rocks	R (Filey south) O-C (other sites)
<i>Myxilla incrustans</i>	Encrusting yellow sponge	Filey Brigg (north side)	O
<i>Haliclona oculata</i>	Mermaid's glove	Calf Allen Rocks, Castle Rocks, Casty Rocks (south), Filey Brigg (north side), Red Cliff	C (Old Horse Rocks), R-O (other sites)
<i>Dysidea fragilis</i>	Goosebump sponge	Calf Allen Rocks, Casty Rocks (north)	R
<i>Porifera indet crusts</i>	Unidentified encrusting sponge	Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Old Horse Rocks, Perilous Rocks, Red Cliff	R (Perilous Rocks), O-C (other sites)

Cnidaria	Anemones, corals and jellyfish		
<i>Hydrozoa</i>	Feather hydroid turf (not identified to species)	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side) Gristhorpe Bay, Perilous Rocks	F-C
<i>Tubularia indivisa</i>	Oaten pipe hydroids	Filey Brigg (north side)	R
<i>Abietinaria abietina</i>	Herring bone hydroid	Perilous Rocks, Scalby Ness	C
<i>Nemertesia antennina</i>	Antenna hydroid	Calf Allen Rocks, Filey Brigg (north side), Knipe Point, Old Horse Rocks, Perilous Rocks	C
<i>Obelia geniculata</i>	Kelp fir	Accropodes, Calf Allen Rocks, Filey Brigg (north and south sides), Red Cliff	O-C

Scientific Name	Common name	Site	Abundance
<i>Alcyonium digitatum</i>	Dead men's fingers	Accropodes, Castle Rocks, Filey Brigg (north side) Gristhorpe Bay, Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff, Scalby Ness	R (Accropodes), O-C (other sites)
<i>Actinia equina</i>	Beadlet anemone	Filey Brigg (south side)	R
<i>Urticina felina</i>	Dahlia anemone	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Filey Brigg (north and south sides), Gristhorpe Bay, Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff, Scalby Ness	F-C
<i>Metridium senile</i>	Plumose anemone	Accropodes, Calf Allen Rocks, Filey Brigg (south side), Old Horse Rocks	R (Accropodes), O (other sites)
<i>Sagartia elegans</i>	Elegant anemone	Accropodes, Calf Allen Rocks, Filey Brigg (north side), Red Cliff	R (Accropodes), O (other sites)

Ctenophora **Comb jellies**

<i>Pleurobrachia pileus</i>	Comb jelly	Castle Rocks	R
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Annelida **Segmented worms**

<i>Eulalia viridis</i>	Green leaf worm	Filey Brigg (south side)	R
<i>Polydora</i>	Boring worms	Casty Rocks (north)	O
<i>Cirratulidae</i>	Hair worms	Perilous Rocks	R
<i>Arenicola marina</i>	Lug worms	Accropodes, Filey Brigg (south side)	R-O
<i>Sabellaria spinulosa</i>	Ross worm	Accropodes, Calf Allen Rocks, Perilous Rocks, Scalby Ness	A (Scalby Ness), O-F (other sites)
<i>Lanice conchilega</i>	Sand mason worm	Filey Brigg (north and south sides), Holbeck	(R) Filey Brigg south, C-A (other sites)
<i>Pomatoceros</i>	Keel worms	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (north and south sides, Perilous Rocks, Scalby Ness	O-C
<i>Spirorbis</i>	Spiral worms	Perilous Rocks	O

Pycnogonida **Sea spider**

<i>Pycnogonida</i>	Sea spider	Filey Brigg (north side), Perilous Rocks	R
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Crustacea **Crabs, shrimp and lobsters**

<i>Cirripedia</i>	Barnacles (indet species)	Calf Allen Rocks, Castle Rocks, Casty Rocks (south), Filey Brigg (south side), Gristhorpe Bay, Holbeck, Knipe Point, Perilous Rocks, Red Cliff	O (Perilous Rocks) C-A (other sites)
<i>Verruca stroemia</i>	Rose barnacle	Filey Brigg (north side)	O
<i>Semibalanus balanoides</i>	Acorn barnacle	Casty Rocks (north), Perilous Rocks, Red Cliff	F-C
<i>Balanus balanus</i>	Acorn barnacle	Accropodes, Perilous Rocks	O-F
<i>Mysidacea</i>	Mysid shrimp (indet species)	Casty Rocks (north)	O
<i>Amphipoda</i>	Amphipod (indet species)	Calf Allen Rocks	R
<i>Jassa falcata</i>	Tube-dwelling amphipod	Accropodes, Calf Allen Rocks, Filey Brigg (north side), Perilous Rocks, Red Cliff	R-O
<i>Caprellida</i>	Caprellid shrimp	Perilous Rocks	O
<i>Idotea</i>	An amphipod	Calf Allen Rocks	R
<i>Caridea</i>	Unidentified shrimp	Accropodes	R
<i>Palaemon serratus</i>	Common prawn	Knipe Point	R
<i>Pandalus montagui</i>	Humpbacked prawn	Accropodes, Perilous Rocks, Scalby Ness	O

Scientific Name	Common name	Site	Abundance
<i>Crangon crangon</i>	Brown shrimp	Filey Brigg (south side), Perilous Rocks	R
<i>Homarus gammarus</i>	Common lobster	Accropodes, Calf Allen Rocks, Casty Rocks (south), Filey Brigg (north and south sides), Gristhorpe Bay, Old Horse Rocks, Perilous Rocks, Red Cliff, Scalby Ness	O-C
<i>Paguridae</i>	Hermit crabs	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (south side), Gristhorpe Bay	R-F
<i>Galatheididae</i>	Squat lobster (indet species)	Casty Rocks (north), Perilous Rocks	R
<i>Galathea strigosa</i>	Spiny squat lobster	Calf Allen Rocks, Filey Brigg (north side), Knipe Point, Old Horse Rocks	R-O
<i>Hyas araneus</i>	Sea toad spider crab	Filey Brigg (north side)	R
<i>Macropodia</i>	Spider crab	Calf Allen Rocks	R
<i>Corystes cassivelaunus</i>	Masked crab	Calf Allen Rocks	F
<i>Cancer pagurus</i>	Edible crab	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (north and south sides), Gristhorpe Bay, Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff	O-C
<i>Liocarcinus depurator</i>	Harbour crab	Crab Hole, Filey Brigg (south side)	R
<i>Necora puber</i>	Velvet swimming crab	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Filey Brigg (north and south sides), Gristhorpe Bay, Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff, Scalby Ness	F-A
<i>Carcinus maenas</i>	Shore crab	Filey Brigg (south side), Holbeck	C
<i>Pilumnus hirtellus</i>	Hairy crab	Perilous Rocks	R

Mollusca

Molluscs

<i>Callochiton septemvalvis</i>	A chiton	Calf Allen Rocks	R
<i>Tonicella marmorea</i>	Marbled chiton	Red Cliff	R
<i>Gibbula cineraria</i>	Grey topshell	Calf Allen Rocks	R
<i>Calliostoma zizyphinum</i>	Painted topshell	Perilous Rocks	R
<i>Tectura virginea</i>	White tortoiseshell limpet	Calf Allen Rocks	R
<i>Patella vulgata</i>	Common limpet	Casty Rocks (north), Red Cliff	C
<i>Helcion pellucidum</i>	Blue rayed limpet	Calf Allen Rocks, Casty Rocks (north), Red Cliff	O-C
<i>Lacuna vincta</i>	Banded chink shell	Accropodes, Calf Allen Rocks, Red Cliff	O-C
<i>Littorina littorea</i>	Edible winkle	Holbeck	C
<i>Rissoa parva</i>	Small snail	Accropodes, Calf Allen Rocks	O-F
<i>Trivia monacha</i>	Spotted cowry	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side)	R-O
<i>Nudibranchia</i>	Nudibranch (indet species or eggs)	Knipe Point, Old Horse Rocks	R
<i>Doto</i>	A nudibranch	Calf Allen Rocks, Perilous Rocks	R
<i>Goniodoris nodosa</i>	White sea slug	Accropodes, Calf Allen Rocks	O
<i>Onchidoris bilamellata</i>	Rough mantled sea slug	Scalby Ness	R
<i>Diaphorodoris luteocincta</i>	Fried egg sea slug	Filey Brigg (north side)	O
<i>Acanthodoris pilosa</i>	Fluffy sea slug	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Red Cliff	R-F
<i>Polycera quadrilineata</i>	Yellow lined Polycera	Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north side), Red Cliff	R-O

Scientific Name	Common name	Site	Abundance
<i>Limacia clavigera</i>	Orange-clubbed sea slug	Filey Brigg (north side), Old Horse Rocks, Perilous Rocks	R-C
<i>Archidoris pseudoargus</i>	Sea lemon	Calf Allen Rocks	R
<i>Jorunna tomentosa</i>	Velvet sea slug	Accropodes, Filey Brigg (north side)	R
<i>Janolus cristatus</i>	Crystal sea slug	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Old Horse Rocks, Perilous Rocks, Red Cliff	C-A (Filey and Castle Rocks), R-O (other sites)
<i>Cuthona caerulea</i>	Blue sea slug	Filey Brigg (north side)	R
<i>Cuthona concinna</i>	Small sea slug	Castle Rocks	R
<i>Eubbranchus pallidus</i>	Pale sea slug	Calf Allen Rocks	R
<i>Facelina auriculata</i>	Iridescent sea slug	Calf Allen Rocks	R
<i>Aeolidiella glauca</i>	Speckled sea slug	Filey Brigg (north side)	R
<i>Mytilus edulis</i>	Edible mussel	Calf Allen Rocks	R
<i>Anomia ephippium</i>	Saddle Oyster	Accropodes, Calf Allen Rocks, Filey Brigg (north side), Scalby Ness	O-C
<i>Solenidae</i>	Razor shells	Calf Allen Rocks	O
<i>Hiatella arctica</i>	Wrinkled rock borer	Casty Rocks (north), Filey Brigg (north side), Red Cliff	C (Casty Rocks), R-O (other sites)

Bryozoa

Sea mats and sea mosses

<i>Bryozoa</i>	Unidentified bryozoan	Old Horse Rocks	R
<i>Crisia</i>	White claw sea moss	Filey Brigg (north side)	O
<i>Alcyonidium diaphanum</i>	Finger bryozoan	Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Old Horse Rocks, Perilous Rocks	O-C
<i>Membranipora membranacea</i>	Sea mat	Accropodes, Calf Allen Rocks, Filey Brigg (north and south sides), Red Cliff	O-C
<i>Electra pilosa</i>	Frosty sea mat	Accropodes, Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north and south sides), Red Cliff	O-C
<i>Flustra foliacea</i>	Hornwrack	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (north side), Gristhorpe Bay, Knipe Point, Perilous Rocks	R (Calf Allen Rocks) O-C (other sites)
<i>Bugula</i>	Christmas tree bryozoan	Filey Brigg (north and south sides)	F
<i>Scrupocellaria scruposa</i>	Fan bryozoan	Perilous Rocks	O
<i>Cellaria</i>	Forked bryozoan	Filey Brigg (north side)	O
<i>Bryozoa indet crusts</i>	Unidentified encrusting bryozoan	Accropodes, Calf Allen Rocks, Filey Brigg (north and south sides), Red Cliff	R-O

Echinodermata

Starfish, urchins and brittle stars

<i>Henricia</i>	Henry starfish	Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Filey Brigg (north side), Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff	O-C
<i>Asterias rubens</i>	Common starfish	Accropodes, Calf Allen Rocks, Castle Rocks, Filey Brigg (north and south sides), Gristhorpe Bay, Knipe Point, Perilous Rocks, Scalby Ness, Red Cliff	O-C
<i>Ophiothrix fragilis</i>	Common brittlestar	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north), Filey Brigg (north side), Perilous Rocks, Red Cliff, Scalby Ness	R (Castle Rocks), O-C (other sites)

Scientific Name	Common name	Site	Abundance
<i>Echinus esculentus</i>	Common sea urchin	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Filey Brigg (north and south sides), Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff, Scalby Ness	O-C

Tunicata

Sea squirts

<i>Clavelina lepadiformis</i>	Light bulb sea squirt	Calf Allen Rocks, Filey Brigg (north side)	O-F
<i>Aplidium punctum</i>	Club sea squirt	Castle Rocks, Filey Brigg (north side), Old Horse Rocks, Red Cliff	O-C
<i>Ciona intestinalis</i>	Yellow ringed sea squirt	Perilous Rocks	R
<i>Botryllus schlosseri</i>	Flower sea squirt	Calf Allen Rocks, Filey Brigg (north side)	R
<i>Botrylloides leachi</i>	Colonial sea squirt	Calf Allen Rocks, Filey Brigg (north side)	O

Pisces

Fishes

<i>Gadidae</i>	Cod family (indet species)	Filey Brigg (north side)	C
<i>Gadus morhua</i>	Cod	Casty Rocks (South)	O
<i>Molva molva</i>	Ling	Calf Allen Rocks	R
<i>Pollachius pollachius</i>	Pollack	Calf Allen Rocks, Casty Rocks (south), Filey Brigg (north side), Knipe Point, Old Horse Rocks, Perilous Rocks, Red Cliff	C (Casty Rocks, Perilous Rocks, Red Cliff), R-O (other sites)
<i>Pollachius virens</i>	Saithe	Calf Allen Rocks, Filey Brigg (north side), Perilous Rocks, Red Cliff	C (Perilous Rocks, Red Cliff), R-O (other sites)
<i>Trisopterus minutus</i>	Poor cod	Perilous Rocks	R
<i>Triglidae</i>	Gurnard	Gristhorpe Bay	O
<i>Taurulus bubalis</i>	Long-spined sea scorpion	Accropodes, Calf Allen Rocks, Filey Brigg (south side), Perilous Rocks, Red Cliff	R-O
<i>Cyclopterus lumpus</i>	Lumpsucker	Calf Allen Rocks, Castle Rocks, Casty Rocks (south), Filey Brigg (north side)	R
<i>Crenilabrus melops</i>	Corkwing wrasse	Red Cliff	R
<i>Ctenolabrus rupestris</i>	Goldsinny	Castle Rocks, Old Horse Rocks, Perilous Rocks	R-O
<i>Labrus bergylta</i>	Ballan wrasse	Calf Allen Rocks, Castle Rocks, Casty Rocks (north and south), Filey Brigg (north side), Old Horse Rocks, Red Cliff	C (Old Horse Rocks), R-O (other sites)
<i>Trachinidae</i>	Weever fish	Perilous Rocks	R
<i>Lipophrys pholis</i>	Shanny	Perilous Rocks	R
<i>Chirolophis ascanii</i>	Yarrell's blenny	Filey Brigg (north side), Perilous Rocks	R
<i>Pholis gunnellus</i>	Butterfish	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north), Filey Brigg (north side), Gristhorpe Bay, Old Horse Rocks, Perilous Rocks, Red Cliff	R-O
<i>Callionymus lyra</i>	Dragonet	Accropodes, Castle Rocks, Filey Brigg (south side), Knipe Point, Perilous Rocks	R-O
<i>Pomatoschistus</i>	Goby (indet species)	Accropodes, Scarborough Harbour	O
<i>Pomatoschistus minutus</i>	Sand goby	Knipe Point	R
<i>Pomatoschistus pictus</i>	Painted goby	Knipe Point, Perilous Rocks	R
<i>Thorogobius ephippiatus</i>	Leopard spotted goby	Calf Allen Rocks, Casty Rocks (south), Filey Brigg (north side), Knipe Point, Perilous Rocks	R-O
<i>Scomber scombrus</i>	Mackerel	Filey Brigg (north side)	O

Scientific Name	Common name	Site	Abundance
<i>Pleuronectiformes</i>	Flatfish (indet species)	Filey Brigg (south side), Gristhorpe Bay, Perilous Rocks, Red Cliff	F (Filey), R (other sites)
<i>Zeugopterus punctatus</i>	Topknot	Knipe Point, Perilous Rocks, Scalby Ness	R-O
<i>Limanda limanda</i>	Dab	Filey Brigg (north side)	R
<i>Microstomus kitt</i>	Lemon sole	Perilous Rocks, Red Cliff	R-O
<i>Pleuronectes platessa</i>	Plaice	Castle Rocks, Perilous Rocks	R-O

Mammalia	Mammals		
<i>Halichoerus grypus</i>	Grey seal	Old Horse Rocks, Red Cliff	O

Algae	Seaweeds		
<i>Rhodophycota</i>	Red seaweed (indet species)	Accropodes, Calf Allen Rocks, Casty Rocks (south), Holbeck, Old Horse Rocks	O-C
<i>Palmaria palmata</i>	Dulse	Calf Allen Rocks, Casty Rocks (north)	O
<i>Rhodothamniella floridula</i>	Sandbinder	Filey Brigg (south side), Red Cliff	O
<i>Corallina officinalis</i>	Coral weed	Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north side), Red Cliff	C (Casty Rocks), R-O (other sites)
<i>Dilsea carnosa</i>	Red rags	Accropodes, Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north and south sides), Red Cliff	F-C (Calf Allen and Casty Rocks), O-R (other sites)
<i>Chondrus crispus</i>	Carrageen	Casty Rocks (north), Filey Brigg (north and south sides), Red Cliff	O-C
<i>Mastocarpus stellatus</i>	Grape pip weed	Casty Rocks (north), Filey Brigg (north side), Red Cliff	R-O
<i>Plocamium</i>	Cock's comb	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north), Filey Brigg (north side), Red Cliff	C-A (Accropodes and Filey), R-O (other sites)
<i>Chylocladia verticillata</i>	Juicy whorl weed	Crab Hole, Filey Brigg (south side)	O
<i>Ptilota gunneri</i>	Feathered wing weed	Crab Hole, Filey Brigg (south side)	O
<i>Cryptopleura ramosa</i>	Fine-veined crinkle weed	Accropodes, Calf Allen Rocks	R-O
<i>Delesseria sanguinea</i>	Sea beech	Accropodes, Calf Allen Rocks, Castle Rocks, Casty Rocks (north), Filey Brigg (north side), Old Horse Rocks, Perilous Rocks, Red Cliff	O-R (Castle and Perilous Rocks) C (other sites)
<i>Hypoglossum hypoglossoides</i>	Tongue weed	Filey Brigg (north side)	F
<i>Membranoptera alata</i>	Winged weed	Calf Allen Rocks, Casty Rocks (north)	O-C
<i>Phycodrys rubens</i>	Sea oak	Casty Rocks (north)	C
<i>Osmundea pinnatifida</i>	Pepper dulse	Casty Rocks (north), Red Cliff	O
<i>Polysiphonia</i>	Many siphoned weed	Calf Allen Rocks, Filey Brigg (south)	C
<i>Phaeophyceae</i>	Brown seaweed (indet species)	Accropodes, Old Horse Rocks	C
<i>Dictyota dichotoma</i>	Brown fan weed	Accropodes, Calf Allen Rocks, Filey Brigg (north side), Red Cliff	O-C
<i>Desmarestia aculeata</i>	Landlady's wig	Calf Allen Rocks, Filey Brigg (north side)	R-O
<i>Desmarestia ligulata</i>	Desmarest's flattened weed	Calf Allen Rocks	C
<i>Laminaria digitata</i>	Oarweed	Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north and south sides), Red Cliff	O-C
<i>Laminaria hyperborea</i>	Forest kelp	Accropodes, Calf Allen Rocks, Casty Rocks (north and south), Filey Brigg (north and south sides), Old Horse Rocks, Red Cliff	C-A
<i>Saccharina latissima</i>	Sugar kelp	Calf Allen Rocks, Filey Brigg (south side)	O-F

Scientific Name	Common name	Site	Abundance
<i>Fucus serratus</i>	Toothed wrack	Casty Rocks (north), Filey Brigg (south side), Red Cliff	O-R
<i>Fucus vesiculosus</i>	Bladder wrack	Holbeck	O
<i>Himantalia elongata</i>	Thongweed	Casty Rocks (north)	C
<i>Ulva lactuca</i>	Sea lettuce	Accropodes, Calf Allen Rocks, Filey Brigg (north and south sides)	O-C
<i>Cladophora</i>	Branched green weed	Red Cliff	O
<i>Bryopsis</i>	Sea fern	Accropodes, Calf Allen Rocks, Casty Rocks (north), Filey Brigg (north side), Red Cliff	R-O
<i>Encrusting algae indet.</i>	Pink encrusting algae	Calf Allen Rocks, Casty Rocks (north and south), Castle Rocks, Filey Brigg (north side), Perilous Rocks, Red Cliff	C-A

Acknowledgements

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