Appendix 7.1

Intertidal Survey Report

Intertidal Survey Report

Dounreay Trì Floating Wind Demonstration Project

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Checked	
Approved	
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Document history

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0.1	29/10/2015	Jennifer Fox	First Draft Version
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0.4	03/08/2016	Jennifer Fox	Final Draft Amended

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1 Introduction

Dounreay Trì Limited has been created by Hexicon to construct and demonstrate a semi-submersible foundation for offshore wind power. It will host two wind turbine generators in a site approximately 9km off Dounreay. The wind farm will have an installed capacity of between 8 and 12 megawatts subject to approval of The Crown Estate. A single export cable will bring the power back to shore at, or near, Sandside Bay, leading to the Dounreay Substation.

Aquatera has been commissioned to carry out a Phase 1 intertidal survey in the Sandside Bay area of Reay, Caithness (See Figure 1.1). The following document reports on the intertidal habitat survey conducted by Aquatera Ltd, which will ultimately be used to inform the Environmental Impact Assessment.

1.1 Objectives

The objectives of the survey were to:

- Identify and map biotopes present within the survey area;
- Identify and map presence of any rare of protected species within the study area; and
- Provide target notes for each biotope and any rare or protected species encountered.

1.2 Survey Area

The survey area can be seen in Figure 1.1. The area is a rocky habitat that reaches from the eastern flank of Sandside Bay to the western side of the Dounreay Site Restoration Limited (DSRL) site.

1.3 Surveyors

The survey was carried out by an experienced marine biologist who was accompanied by a second consultant experienced with species identification to assist with photography and recording of notes.

1.4 Survey Conditions

The survey took place on Monday 12 October 2015 during low spring tide. The survey took place either side of low tide. Table 1.1 outlines the survey conditions.

Table 1.1 Survey Details

Details	Note
Date	12 October 2015
Time at start	13.30 BST
Time at finish	17.00 BST
Low tide (hours)	15.30 BST
Type of access	Foot
Sea Condition	Sea State 3-4, unremarkable
Weather Condition	Sunny, 11/12°C, Moderate breeze

1.5 Site Description

The survey area is approximately 0.9km long and varies in width (up to 100m) due to variable substrate and tidal conditions. The aspect of the area is north facing. The area is exposed to waves from the north and northwest.

The rock formation is described by the British Geological Survey as "sandstone dominated cyclic sequence with siltstone and calcareous (fish bed) laminate limestones" (http://data.bgs.ac.uk/doc/Lexicon/NamedRockUnit/SABA.html). This rocky area stretches to the boundary of the survey site.

The site is open to the public and was seen to be used by dog walkers. There are warning signs displayed advising not to remove any material, including sand or shellfish from the site. There was some fishing gear seen that appeared to have been washed up from the sea rather than discarded at the site.

The marine area beyond the intertidal zone is designated as the North Caithness Cliffs Special Protection Area (SPA). This designation is intended specifically for the protection of seabirds.

1.6 Limitations

Due to the timing of the survey, only one low tide window was available on the day during daylight hours, however, it was possible to cover the entire survey area during the single survey period.

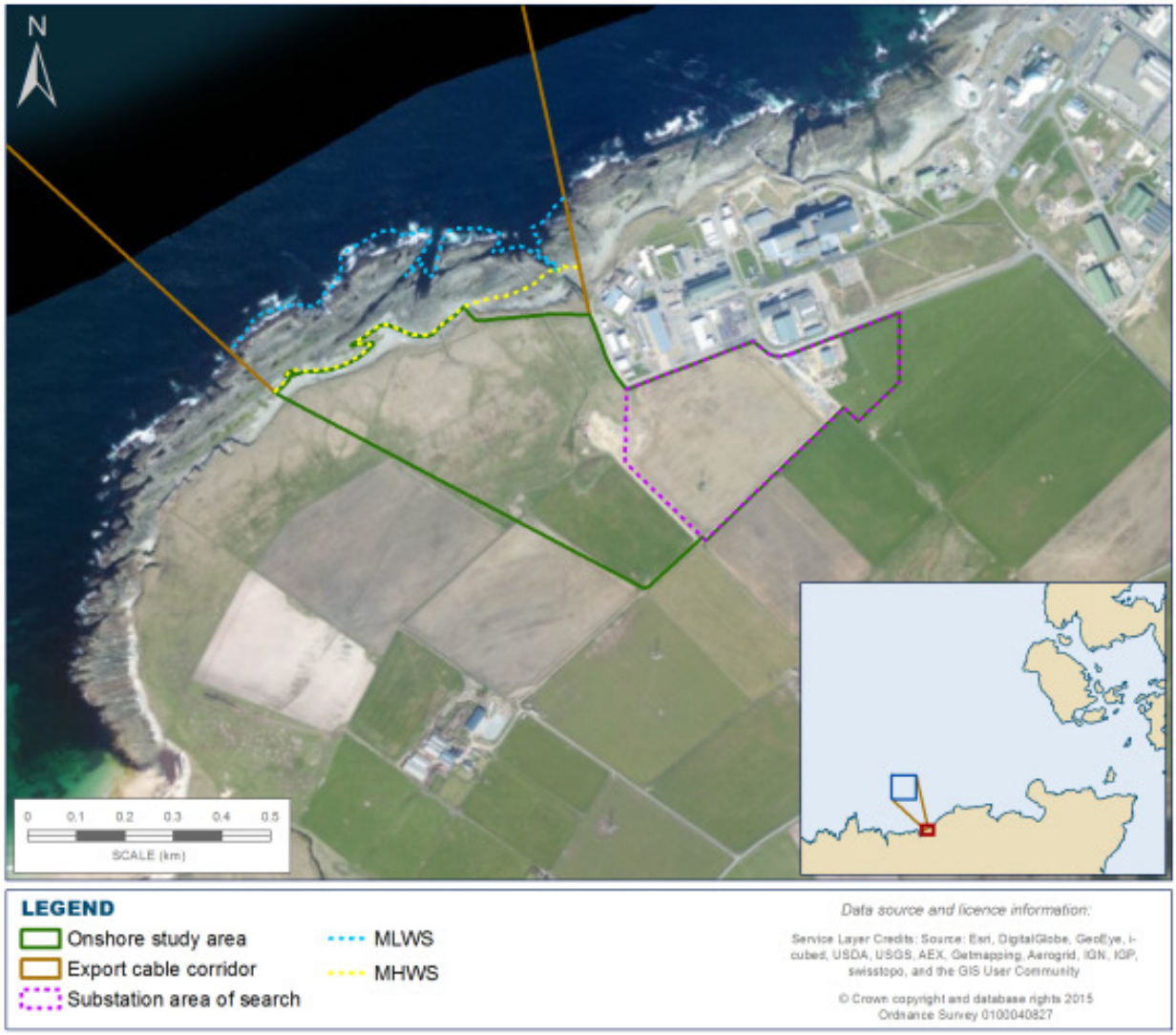

Figure 1.1 Location of Project Site & boundaries of survey area

2 Methodology

The methodology is based on the Countryside Council for Wales (CCW) 'Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey' (Wyn *et al*., 2000) and the 'Marine Nature Conservation Review: Rationale and Methods' (Hiscock, 1996).

The methods are designed to make the results compatible with subtidal habitat mapping and Terrestrial Phase 1 mapping. In terms of detail, the techniques utilised lie between Terrestrial Phase 1 mapping (JNCC, 1993) and Marine Nature Conservation Review Phase 2 marine survey methodologies (Hiscock, 1996). It is more detailed than Terrestrial Phase 1, but unlike Phase 2, does not collect full species lists for each biotope recorded.

2.1 The Intertidal Zone

The methodology presented covers an area of the shore known as the littoral or intertidal zone. This realm extends from the splash zone just above Mean High Water Springs (MHWS), down the kelp zone at Mean Low Water Springs (MLWS).

2.2 Outline Survey and Mapping

Prior to the survey, satellite imagery from Esri Arc GIS at 1:5,000 scale was used to identify possible biotope boundaries in order to ensure the surveyors were familiarised with the area and that the survey could be conducted in a time efficient manner. A wireframe map was produced from this (Figure 1.1).

2.3 Risk Assessment and Pre Survey Checklists

A pre-survey work checklist, taken from the CCW handbook (Wyn *et al.,* 2000) and adapted for Aquatera use, is provided in Section 6.1 Appendix 1. A full risk assessment was also completed. The local landowner was contacted prior to the survey to request access and notify them of the survey plan.

Ministry of Defence Vulcan security, DSRL security and the local Civic Nuclear Constabulary were also informed of survey activities due to the proximity of the site to the Dounreay nuclear plant, detection of particles on the beach and ongoing monitoring by DSRL.

2.4 Field Survey

Each biotope encountered was recorded as surveyors proceeded across the survey area. Each time the biotope changed, this was recorded. Photos were taken as well as notes of the dominant species present. A Garmin GPSMAP 62sc was used to mark target points and tracks.

Post survey; all information was digitised using ArcMap 10. Maps were created using the guidance laid out in the CCW report (Wyn *et al.,* 2000). Biotopes were assigned and described with reference to The Marine Habitat Classification for Britain and Ireland (v04.05) (Connor *et al.*, 2004). All species names were taken from the Marine Life Information Network (MarLIN, 2015) and the Algaebase (2015) website for certain species of seaweed, which were not listed on the MarLIN site.

3 Results

3.1 Description of Habitat Types and Locations throughout the Survey Area

At the western boundary of the survey area, the dominant species on the rocky shore was *Pelvetia canaliculata*. *F. spiralis* was also present in this area, as well as barnacles *Semibalanus balanoides*, limpets *Patella vulgata* and dog whelks *Nucella lapillus*. This biotope can be characterised as "*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock (LR.MLR.BF.PelB)" (Figure 3.13).

Figure 3.1 *Pelvetia canaliculata* zone

Figure 3.2 *Pelvetia canaliculata*

On the higher shore, there was a barnacle zone. Relatively flat boulders were covered with barnacles *S. balanoides*. There were also limpets *P. vulgata* present in this area and green lichen. This biotope can be described as "*Semibalanus balanoides* on exposed to moderately exposed or vertical sheltered eulittoral rock LR.HLR.MusB.Sem)" (See Figure 3.13).

Further down the shore was a fucoid zone. The barnacles were less dominant and there was a much higher concentration of *F. vesiculosus* and *F. spiralis*. This biotope can be characterised as "*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock (LR.MLR.BF.FspiB)". In this area there was also presence of green lichen, barnacles *S. balanoides*, dog whelk *N. lapillus*, limpets *P. vulgata* and mussels *Mytilus edulis* (See Figure 3.13).

Figure 3.3 Dense layer of barnacles covers all rock surfaces

Figure 3.4 Barnacles zone above the tide line, with fucoids dominating below the tide line

In this area, and throughout the rocky intertidal zone, there were many rockpools. Some were large and permanent and some were small, shallow and likely to be temporary. In the large, permanent rockpools the dominant species included *Laminaria digitata*, *F.spiralis*, *Cladophora spp*., *Actinia equina*, *N. lapillus* and *P. vulgata*. This is designated as "Fucoids and kelp in deep eulittoral rockpools (LR.FLR.Rkp.FK)".

The second type of rockpool biotope was much smaller, and shallower. This type of rockpool could be classified as one of two biotopes. The first was more common and was classified by the presence of the *Corallina officinalis*. In these rockpools, there was also a presence of green seaweeds such as *Cladophora spp.* and *U. lactuca*. There was also grazing molluscs such as *Littorina littorea* and *P. vulgata and* anemones such as *A. equina*. This rockpool biotope is classed as "*Corallina officinalis*, coralline crusts and brown seaweeds in shallow eulittoral rockpools (LR.FLR.Rkp.Cor)". The second shallow rockpool biotope was dominated by green seaweeds *Cladophora spp*., and *U. lactuca.* This is classified as "Green seaweeds (*Enteromorpha spp*. and *Cladophora spp*.) in shallow upper shore rockpools (LR.FLR.Rkp.G)".

Figure 3.5 Example of rockpool with *Corallina officinalis*

Figure 3.6 *Corallina officinalis* and green seaweeds in shallow rockpool

Figure 3.7 Shallow rockpool with layer of green seaweed at the surface

At the highest point of the shore, there was a band of lichen zone, where there was no barnacle cover and the rock was covered in black, green and white lichens. There was *P. vulgata*, *Littorina spp*. and *N. lapillus* present here, although in relatively small numbers. This biotope is classed as "Lichens or small green algae on supralittoral rock (LR.FLR.Lic)" (See Figure 3.13).

Figure 3.8 Black, green and white lichens on rock surfaces

At the lower shore, there was a high density of *Fucus serratus*. There was also *F. spiralis* and *P. canaliculata*. The faunal species *A. equina*, dog whelks *N. lapillus* and winkles *Littorina littorea* were also present here. This zone is defined as "*F. serratus* and under-boulder fauna on lower eulittoral boulders (LR.MLR.BF.Fser.Bo)" (See Figure 3.13).

Figure 3.9 *Fucus serratus* dominates at the lower shore.

The lowest part of the shore is part of the infralittoral zone and is identified as "*Laminaria digitata* on moderately exposed sublittoral fringe rock (IR.MIR.KR.Ldig)". *Himanthalia elongata*, *L. digitata* and *F. serratus were* present in this zone. This zone stretched along the whole survey area from this point at the lowest part of the shore (See Figure 3.13).

Figure 3.10 Kelps present in the infralittoral zone

From this point, until the end of the survey zone, the aforementioned biotopes continued to the eastern boundary of the survey area. The majority of the upper shore was largely devoid of fauna such as whelks, winkles, limpets and barnacles. The majority of this area was a lichen dominated zone, classified as "Lichens or small green algae on supralittoral rock (LR.FLR.Lic)". Within this area, there were frequent small, shallow rockpools where green seaweeds *Ulva spp.* were common ("Green seaweeds (*Enteromorpha spp*. and *Cladophora spp*.) in shallow upper shore rockpools (LR.FLR.Rkp.G)".

There was an occasional patch of the biotope "*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock (LR.MLR.BF.PelB)" on the mid shore.

There were also occasional dense patches of barnacles above the tide line, as described in biotope "*Semibalanus balanoides* on exposed to moderately exposed or vertical sheltered eulittoral rock LR.HLR.MusB.Sem)".

Figure 3.11 Dense layer of barnacles on rock surfaces

Figure 3.12 Barnacle growth alongside *Mytilus edulis*

Below the tide line, there was a consistent zone of fucoid cover, classified as "*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock (LR.MLR.BF.FspiB)".

On the low shore, there was a zone dominated by *F. serratus* ("*F. serratus* and under-boulder fauna on lower eulittoral boulders (LR.MLR.BF.Fser.Bo))". This gave way to a kelp zone in the infralittoral zone "*Laminaria digitata* on moderately exposed sublittoral fringe rock (IR.MIR.KR.Ldig)".

3.2 Biotopes

In total, nine biotopes were recorded over the intertidal survey area. Table 3.1 outlines the biotopes found, each type of biotope is coloured to illustrate its distribution on the map in Figure 3.13. The colouring of each polygon in Figure 3.13 is mapped at lifeform level. Bunker & Foster-Smith (1996) was used to group the biotopes into six biotope types; broader mapping units that describe several biotopes.

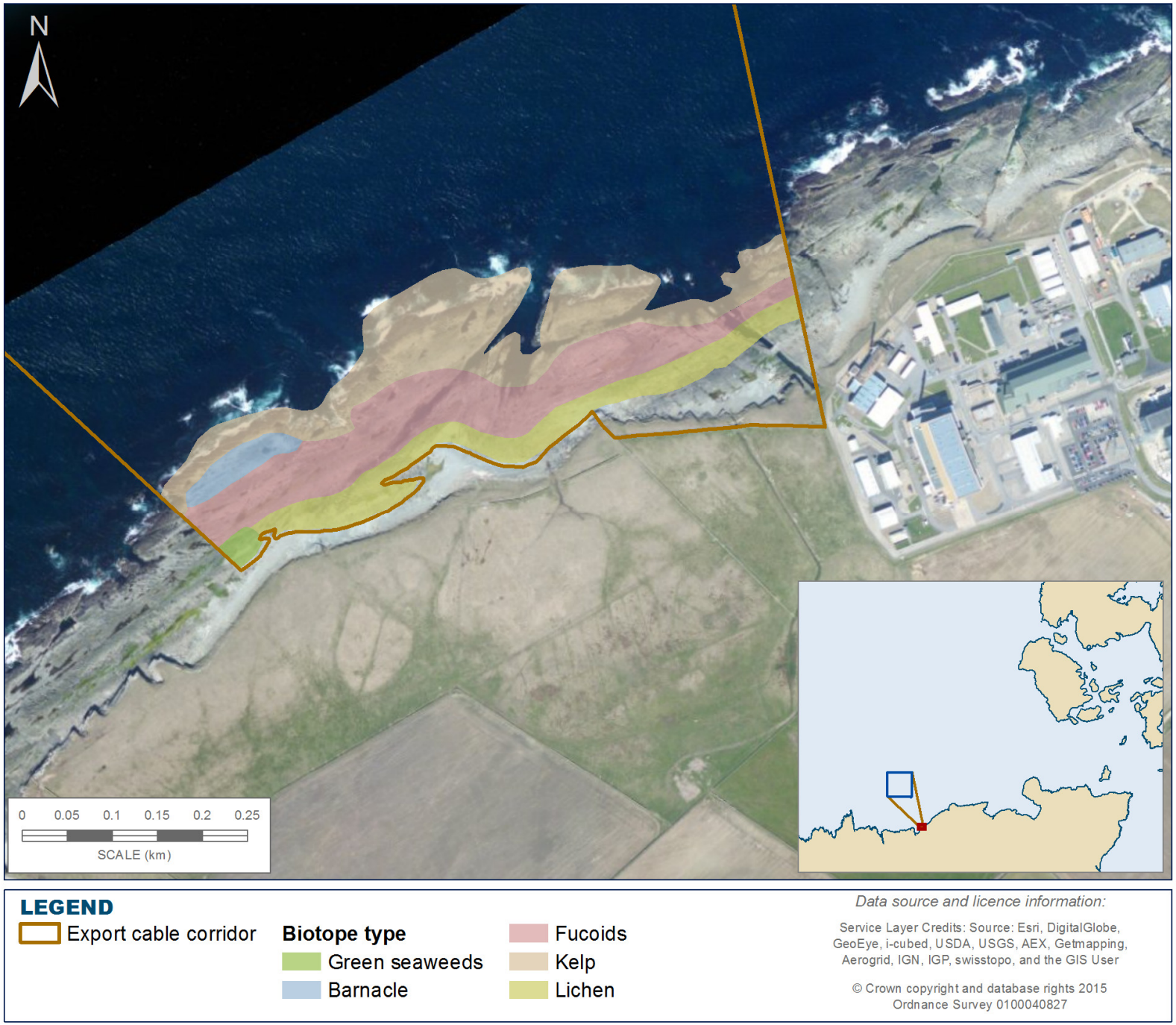

Figure 3.13 Intertidal survey area with major biotopes outlined.

Table 3.1 Summary of biotopes present in Sandside Bay intertidal survey area

Biotope Code	Biotope Description	Notes
LR.MLR.BF.PelB	*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock	*P. canaliculata* zone in between barnacle zone and black lichen zone
LR.HLR.MusB.Sem	*Semibalanus balanoides* on exposed to moderately exposed or vertical sheltered eulittoral rock	Above the level of low tide a large area of barnacle covered rock. This area also had *P. vulgata and N. lapillus*.
LR.MLR.BF.FspiB	*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock	Mid- high shore, boulders dominated by *F. spiralis* and *Cladophora spp*.
LR.FLR.Rkp.FK	Fucoids and kelp in deep eulittoral rockpools	Rockpool that is big, deep and dominated by kelp, and fucoids.
LR.FLR.Rkp.G	Green seaweeds (*Enteromorpha spp*. and *Cladophora spp*.) in shallow upper shore rockpools	Small, shallow rockpool covered in a carpet of green algae.
LR.FLR.Rkp.Cor	*Corallina officinalis*, coralline crusts and brown seaweeds in shallow eulittoral rockpools.	Small shallow rockpool dominated by *Corallina officinalis*
LR.FLR.Lic	Lichens or small green algae on supralittoral rock	Occurs in the upper splash zone. Characterised by presence of lichens and *Ulva lactuca*.
LR.MLR.BF.Fser.Bo	*Fucus serratus* and under-boulder fauna on lower eulittoral boulders	Low shore, large boulders dominated by *F. serratus*.
IR.MIR.KR.Ldig	*Laminaria digitata* on moderately exposed sublittoral fringe rock	Sublittoral kelp zone. *Hemanthalia elongata* (thong weed) was mixed in with the kelp zone in this location.

4 Conclusions

The UK Biodiversity Action Plan list of priority habitats (JNCC, 2007) includes intertidal boulder communities. This Biodiversity Action Plan aims to ensure the ongoing monitoring of these habitats so that any change in their frequency or health can be measured. Intertidal boulder communities are on this list as they are a functional habitat and are in decline in the UK. They are also a habitat for which the UK has international obligations for conservation (Council Directive 92/43/EEC).

The dog whelk (*Nucella lapillus*) is an OSPAR species (OSPAR, 2008) and was found on most of the intertidal rock. The Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention is the current legislative instrument regulating international cooperation on environmental protection in the North-East Atlantic. However, the dog whelk is a common species in the UK and is not protected under any other piece of legislation. No UK BAP priority marine species were recorded.

It is possible that there could be potential impacts on the intertidal boulder community both directly from cable laying and indirectly from changes to the topography of the bay during the construction phase. It is unlikely that there will be significant environmental impact as a result of this.

5 References

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Connor, D.W., Allen, J.H., Golding, N. Howell, K.L., Lieberknecht, L.M., Northen, K.O. and Reker, J.B. 2004. The Marine Habitat Classification for Britain and Ireland, Version 04.05 JNCC, Peterborough (internet version www.jncc.gov.uk/MarineHabitatClassification).

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Hiscock, K. (ed). 1996. Marine Nature Conservation Review: rationale and methods. Peterborough, JNCC. (Coasts and seas of the United Kingdom. MNCR series).

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British Geological Survey [online] Available at http://data.bgs.ac.uk/doc/Lexicon/NamedRockUnit/SABA.html) [Accessed 13/10/2015]

6 Appendices

6.1 Appendix 1 Data Collection Sheets used during Survey

Task	Complete
Check that the aerial imagery available through ArcGIS is suitable, if not obtain aerial photography from the emapsite.	
Compile any existing survey data including information on habitats and species recorded in the area.	
Obtain local information about access, land ownership and hazards such as steep cliffs, deep mud or rivers.	
Obtain permission for access where necessary. Note that the presence of a public footpath does not automatically give the right of access to a site; permission from the landowner must still be obtained.	
Find out about scheduled species that may be disturbed by the survey e.g. breeding birds and pupping seals. Avoid these areas if possible and seek advice from the relevant Nature Conservation Agency (SNH/Marine Scotland). Obtain any required licences.	
Carry out a risk assessment of the survey work and train staff in health and safety issues as required (see Appendix C).	
Train staff and agree recording standards.	
Schedule survey days according to spring tides.	
Organise survey accommodation, travel arrangements and boat hire (if applicable).	
Divide coastline/survey area into sites as required e.g. SSSI, selection units.	
Produce wireframe maps at 1:5,000.	
Assemble survey equipment and Personal Protective Equipment (PPE).	

Intertidal Phase 1 Survey Form: Page 1

Site no.

Site Name:……

Survey Area:……

County:……..

Area of Search:…… Selection Unit:……

Centre of Site (Grid ref): ……..

Extent of Site (N to S) From:…… To:……

Position derived from: OS Map GIS

	Visit 1	Visit 2	Visit 3	Visit 4
Surveyor 1				
Surveyor 2				
Surveyor 3				
Surveyor 4				

Date	
Time at Start	
Time at Finish	

Tide Height (m)	
Low Tide (hours)	
Type of Access	
(boat/foot)	
Sea Condition	
Weather Condition	

N.B. Sea / weather condition: Good, Poor and Bad

Additional people on survey: incl. date, job title, reason for coming on survey

Survey Status	✓	Comments
Further Phase 1 recommended		
Further Phase 2 recommended		
Phase 2 data available		

aquatera environmental services and products

Intertidal Phase 1 Survey Form: Page 2

Physiographic features

Site no.

Physiographic Type	✓
Open Coast	
Linear Coast	
Islands/Rocks	
Semi-enclosed Coast	
Strait/Sound	
Barrier Beach	
Enclosed Coast	
Embayment/Inlet	
Ria	
Estuary	
Isolated Saline Water	
Littoral Width	**✓**
<1 m	
1 – 10 m	
10 – 100 m	
100 – 1000 m	
>1000 m	
Littoral Aspect	**✓**
North	
North-east	

Wave Exposure	✓
Exposed	
Moderately Exposed	
Sheltered	
Tidal Streams	
Strong (>3 kn)	
Mod.strong (1 – 3 kn)	
Weak (<1 kn)	
Unknown	
Salinity	**✓**
Full (30 – 40 %)	
Variable (18 – 40 %)	
Reduced (18 – 30 %)	
Low (<18 %)	
Inclination	**✓**
Vertical faces (80 – 100 E)	
Very steep faces (40 – 80 E)	
Upper faces (0 – 40 E)	
Architecture	**✓**
Rockpools	
Overhangs	

Substratum	✓
Bedrock	
Very large boulders >1.024 m	
Large boulders 0.512 – 1.024 m	
Small boulders 25.6 – 51.2 cm	
Cobbles 6.4 – 25.6 cm	
Pebbles 1.6 – 6.4 cm	
Gravel 4 – 16 mm	
Stone	
Shell	
Dead maerl	
Live maerl	
Sand-coarse 1 – 4 mm	
Sand-medium 0.25 – 1mm	
Sand-fine 0.063 – 0.25 mm	
Mud <0.063 mm	
Artificial – metal	
Artificial stone / concrete	
Artificial – wood	
Peat	
Substratum Type	**✓**

East	
South-east	
South	
South-west	
West	
North-west	
South and east facing	
South and west facing	
North and east facing	
North and south facing	
North and west facing	
West and east facing	
All Aspects (e.g. island)	

Underboulders	
Gully	
Cave	
Shore Backing	✓
Hard cliff	
Soft cliff/scree	
Boulder clay	
Storm beach	
Dunes	
Saltmarsh	
Pasture	
Artificial	

Hard – Unknown	
Hard – Slate	
Hard – Sandstone/Mudstone	
Moderately Hard – Unknown	
Moderately hard – Limestone	
Moderately Hard – Friable	
Moderately Hard – Slate/Shale	
Soft – Unknown	
Soft – Sandstone/Mudstone	
Soft – Chalk/Limestone	
Very soft – Unknown	
Very soft – Clay	
Very soft – Peat	

Intertidal Phase 1 Survey Form: Page 3

Uses and impacts

Site no.

Uses & Impacts	✓	Notes
Fishing – netting		
Fishing – angling		
Collection – bait digging		
Collection – shellfish		
Collection – algae		
Boulder turning for peelers		
Extraction – sand/gravel		
Extraction – maerl		
Aquaculture – algae		
Coastal defence – seawalls		
Coastal defence – dredging		
Coastal defence – groynes		
Land claim		
Military use		
Sewage discharge		
Waste dumping		
Industrial waste discharge		
Litter and debris		
Oil/tar/chemicals		
Educational/Scientific study		
Recreational – facilities		
Recreational – resort		

Recreational – marina		
Recreational – popular beach		
Recreational – water sports		
Recreational – wind surfing		
Mooring/beaching/launching		
Evidence of physical damage		
Other		

Intertidal Phase 1 Survey Form: Page 4

Conservation interests

Site no.

Conservation interests	✓	Notes
Unspoilt/Natural		
Intrinsic appeal		
Good zonation		
High biotope richness		
Highly species rich		
Ornithological interest		
Seal haul out		

Biotopes	✓	Specify biotopes
Specialised biotopes		
Nationally important		
BAP		
AoS rare		
AoS scarce		

Species	✓	Specify species abundance and biotopes
Internationally rare		
Nationally rare		
Nationally scarce		
BAP		
Northern distribution		
Southern distribution		

Introduced Species		
Non-native (established)		
Non-native (not established, e.g. Farmed, Washed up)		

Intertidal Phase 1 Survey Form: Page 5

Artificial Substrata

Site no.

Artificial Substrata	✓	Notes & Target Note References	Biotopes
Sea-wall (quay, bridge supports)			
Rip-rap (large boulders)			
Gabions			
Outfalls (sluice)			
Slipway			
Groyne			
Pontoon			
Jetty			
Moorings			
Drydock			
Breakwater			
Tip waste			
Other (wooden posts, wreck etc.)			

Intertidal Phase 1 Survey Form: Page 6

Site Description

	Site no.

Site Description
[Specific reason for site selection; outline biotopes present, particularly their spatial arrangement; general location of site; highlight any unusual or important features of conservation value; shore type; existing SSSI designations; uses and impacts]

SSSI Designation:	**Copy of SSSI citation on file:**
Other Conservation Designations:	
Access Type: Road / Track / Path **(Road – vehicular access, Track – 4x4 vehicular access, Path – foot access only)** **Status: Public / Private** **Contact Details:** **Notes:**	
File name and location of site description:	

Typical biotopes for rocky shores

Site no.	

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
LR	LR.HLR	LR.HLR.MusB	MytB		
			Cht		
				Cht.Cht	
				Cht.Lpyg	
			Sem		
				Sem.Sem	
				Sem.FvesR	
				Sem.LitX	
		LR.HLR.FR	Fdis		
			Coff		
				Coff.Coff	
				Coff.Puly	
			Him		
			Pal		
			Mas		
			Osm		
			RPid		
		LR.HLR.FT	AscT		
			FserT		
			FserTX		

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
	LR.MLR	LR.MLR.MusF	MytFves		
			MytFR		
			MytPid		
		LR.MLR.BF	PelB		
			FspiB		
			FVesB		
			Fser		
				Fser.R	
				Fser.Bo	
				Fser.Pid	
			Rho		
	LR.LLR	LR.LLR.F	Pel		
			Fspi		
				Fspi.FS	
				Fspi.X	
			Fves		
				Fves.FS	
				Fves.X	
			Asc		
				Asc.FS	
				Asc.X	
			Fserr		
				Fserr.FS	
				Fserr.X	
		LR.LLR.FVS	PelVS		

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
			FspiVS		
			FvesVS		
			AscVS		
			Ascmac		
			FserVS		
			Fcer		
	LR.FLR	LR.FLR.Lic	YG		
			Pra		
			Ver		
				Ver.B	
				Ver.Ver	
			Bli		
			UloUro		
		LR.FLR.Rkp	G		
			Cor		
				Cor.Cor	
				Cor.Par	
				Cor.Bif	
				Cor.Cys	
			FK		
				FK.Sar	
			SwSed		
			H		
		LR.FLR.CvOv	ChrHap		
			GCv		
			AudPil		
			AudCla		

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
			VmucHil		
			SpR		
				SpR.Den	
			SpByAs		
			FaCr		
			ScrFa		
			BarCv		
		LR.FLR.Eph	Ent		
			EnrPor		
			EphX		
			BLitX		

Typical biotopes for sedimentary shores

Site no.	

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
LS	LS.LCS	LS.LCS.Sh	BarSh		
			Pec		
	LS.LSa	LS.LSa.St	Tal		
			MytFab		
		LS.LSa.MoSa	BarSa		
			Ol		
				Ol.FS	
				Ol.VS	
			AmSco		
				AmSco.Sco	

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
				AmSco.Eur	
				AmSco.Pon	
		LS.LSa.FiSa	Po		
				Po.Pfui	
				Po.Aten	
				Po.Ncir	
		LS.LSa.MuSa	MacAre		
			CerPo		
			HedMacEte		
			BatCare		
			Lan		
	LS.LMu	LS.LMu.MEst	NhomMacStr		
			HedMac		
			HedMacScr		
		LS.LMu.UEst	NhomStr		
			Hed		
				Hed.Str	
				Hed.Cvol	
				Hed.Ol	
			Tben		
	LS.LMx	LS.LMx.GvMu	HedMx		
				HedMx.Mac	
				HedMx.Scr	
				HedMx.Str	
				HedMx.Cir	
				HedMx.Cvol	
		LS.LMx.Mx	CirCer		
	LS.LMp	LS.LMp.Sm	NVC types		

Broad Habitat Code	Habitat Complex Code	Biotope Complex Code	Biotope Code (shortened)	Sub-biotope Code (shortened)	✓
		LS.LMp.LSgr	Znol		
	LS.LBR	LS.LBR.Sab	Salv		
		LS.LBR.LMus	Myt		
				Myt.Mx	
				Myt.Sa	
				Myt.Mu	

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Biotope Descriptions

Site no.	

Biotope Code	Notes	Sp. list	Specialised biotopes % cover & non-native sp. abundance

Intertidal Phase 1 Survey Form: Page 12

Biotope Descriptions

Site no.	

Biotope Code	Notes	Sp. list	Specialised biotopes % cover & non-native sp. abundance

Specialised Biotopes

Site no.

Complete species list for specialised and Nationally important biotopes	
Biotope	Species list
File name and location of specialised biotope species lists: Typed species list attached to form	

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Target Notes & Digital Photographs/Slides

Site no.

Target Notes
File name and location of target notes: Typed target notes attached to form

Slide/Digital Photographs					
File name and location (digital photos):					
Photo number.	**SV/HV/BV**	**Caption**	**Keywords**	**Date**	**Photographer**

Intertidal Phase 1 Survey Form: Page 15

Target Notes & Digital Photographs/Slides

Site no.	

Photo number.	SV/HV/BV	Caption	Keywords	Date	Photographer

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Species list checklist

Site no.	

Species list Site Name/No.: Date: Surveyors:

PORIFERA :CALCAREA :CALCAREA	
	Clathrina coriacea
	Grantia compressa
	Leuconia nivea
	Scypha ciliata
:DEMOSPONGIAE	
	Amphilectus fucorum
	Cliona celata
	Dysidea fragilis
	Halichondria panicea
	Halisarca dujardini
	Hymeniacidon perlevis
	Myxilla incrustans
	Ophlitaspongia papilla
	Pachymatisma johnstonia
	Porifera indet. (non crusts)
	Porifera indet. (crusts)

NEMATODA	
	Nematoda indet.
ANNELIDA :POLYCHAETA :POLYCHAETA	
	Aphroditidae indet.
	Arenicola marina
	Capitella sp.
	Cirratulidae indet.
	Cirratulus cirratus
	Cirriforma tentaculata
	Eteone longa
	Eulalia viridis
	Glycera tridactyla
	Harmothoe sp.
	Hediste diversicolor
	Lagis koreni
	Lanice conchilega
	Melinna palmata

	Chthamalus stellatus
	Elminius modestus
	Semibalanus balanoides
	Verruca stroemia
:ISOPODA	
	Eurydice pulchra
	Idotea sp.
	Isopoda indet.
	Ligia oceanica
	Sphaeroma rugicauda
:AMPHIPODA	
	Amphipoda indet.
	Bathyporeia sp.
	Corophium sp.
	Gammaridae indet.

	Suberites ficus
CNIDARIA :HYDROZOA :HYDROZOA	
	Dynamena pumila
	Hydrozoa indet.
	Obelia geniculata
	Sertularia argentea
	Tubularia indivisa
:ANTHOZOA	
	Actinia equina
	Actinia fragacea
	Acinothoe sphyrodeta
	Anemonia viridis
	Anthozoa indet.
	Aulactinia verrucosa
	Cereus pedunculatus
	Corynactis viridis
	Metridium senile
	Sagartia elegans
	Urticina felina
NEMERTEA	

	Neanthes virens
	Nephtys sp.
	Nereis sp.
	Notomastus sp.
	Owenia fusiformis
	Polychaeta indet.
	Polydora sp.
	Pomatoceros lamarcki
	Pomatoceros triqueter
	Pomatoceros sp.
	Pygospio elegans
	Sabella pavonina
	Sabellaria alveolata
	Scolelepis squamata
	Scoloplos armiger
	Serpulidae indet.
	Spirobidae indet.
:OLIGOCHAETA	
	Oligochaeta indet.
	Tubificoides benedii
CRUSTACEA :CIRRIPEDIA :CIRRIPEDIA	
	Cirripedia indet. (juv)

	Haustorius arenarius
	Pontocrates sp.
	Talitridae indet.
	Talitrus saltator
:DECAPODA	
	Cancer pagarus
	Carcinus maenas
	Caridae indet. (prawns)
	Corystes cassivelaunus
	Crangon crangon
	Diogenes pugilator
	Liocarcinus depurator
	Necora puber
	Pagarus bernhardus
	Palaemon serratus
	Pilumnus hirtellus
	Pisidia longicornis
	Pocellana platycheles
	Xantho incises
:CHELICERATA	
	Halacaridae indet. (mites)
	Pycnogonidae indet.

	Lineus longissimus
	Nemertea indet.

	Balanus balanus
	Balanus crenatus
	Balanus improvises
	Balanus perforates
	Chthamalus montagui

	Pycnogonum littorale
:INSECTA	
	Anurida maritima

Intertidal Phase 1 Survey Form: Page 17

Species list checklist

Site no.	

Species list Site Name/No.: Date: Surveyors:

	Insecta indet.
	Petrobius maritimus
MOLLUSCA	
	Acanthochitona
	Lepidochitona
	Leptochiton asellus
	Polyplacophora
	Calliostoma
	Crepidula fornicata
	Gibbula cineraria
	Gibbula umbilicalis
	Helcion pellucidum
	Hydrobia sp.
	Hydrobia ulvae
	Littorina littorea
	Littorina neglecta
	Littorina nigrolineata
	Littorina obtusata

	Ensis ensis
	Ensis siliqua
	Fabulina fabula
	Heteranomia squamula
	Hiatella arctica
	Lutraria lutraria
	Macoma balthica
	Mya arenaria
	Mya truncate
	Mytilus edulis
	Ostrea edulis
	Pholas dactylus
	Scrobicularia plana
	Tapes rhomboides
	Venerupis senegalensis
BRYOZOA	
	Alcyonidium diaphanum
	Alcyonidium gelatinosum
	Alcyonidium hirsutum
	Bryozoa indet. (crusts)
	Bryozoa indet. (non-

TUNICATA	:ASCIDIA
	Aplidium punctum
	Ascidium conchilega
	Ascidiacea indet.
	Ascidiella scabra
	Ascidiella sp.
	Botrylloides leachi
	Botryllus schlosseri
	Clavelina lepadiformis
	Didemnidae indet.
	Morchellium argus
	Polyclinidae indet.
	Polyclinum aurantium
	Styela clava
PISCES	
	Ammodytes sp.
	Gobiidae indet.
	Lipophrys pholis
	Pholis gunnellus
	Pisces indet.
	Pomatoschistus minutus

	Littorina saxatilis
	Melarhaphe
	Nucella lapillus
	Osilinus lineatus
	Patella depressa
	Patella
	Patella vulgata sp.
	Rissoidae indet.
	Trivia monacha
:OPISTHOBRANCHIA	
	Acteon tornatilis
	Archidoris
	Philine aperta
	Retusa obtuse
:BIVALVIA	
	Angulus tenuis
	Anomia ephippium
	Barnea candida
	Cerastoderma edule
	Chamelea gallina
	Crassostrea gigas
	Donax vittatus

	Bugula sp.
	Crisiidae indet.
	Electra pilosa
	Flustrellidra hispida
	Membranipora
ECHINODERMATA	
	Asterina gibbosa
	Asterias rubens
:OPHIUROIDEA	
	Amphipholis squamata
	Ophiothrix fragilis
	Ophiura ophiura
	Ophiuoidea indet.
:ECHINOIDEA	
	Echinocardium cordatum
	Echinus esculentus
	Psammechinus miliaris

RHODOPHYTA	
	Ahnfeltia plicata
	Audouinella purpurea
	Gelidium latifolium
	Gelidium pusillum
	Hildenbrandia rubra
	Nemalion helminthoides
	Palmaria palmata
	Porphyra purpurea
	Porphyra umbilicalis
	Rhodothamniella floridula
:CORALLINALES	
	Corallina officinalis
	Corillinaceae indet.
	Mesophyllum lichenoides
:GIGARTINALES	
	Calliblepharis jubata
	Catenella caespitosa
	Chondrus crispus
	Cystoclonium purpureum

Species list checklist

Site no.	

Species list Site Name/No.: Date: Surveyors:

	Dilsea carnosa
	Dumontia contorta
	Furcellaria lumbricalis

	Demarestia aculeata
	Dictyota dichotoma
	Ectocarpacae indet.

	Mastocarpus stellatus
	Phyllophora
	Plocamium cartilagineum
	Polyides rotundus
:GRACILARIALES	
	Gracilaria verrucosa
:RHODYMENIALES	
	Gastroclonium ovatum
	Lomentaria articulata
	Lomentaria clavellosa
:CERAMIALES	
	Ceramium sp.
	Cryptopleura ramosa
	Delessaria sanguinea
	Halurus equisetifolius
	Halurus flosculosus
	Hypoglossum
	Membranoptera alata
	Osmundea hybrid
	Osmundea pinnatifida
	Phycodrys rubens
	Plumaria plumose
	Polysiphonia lanosa
	Polysiphonia sp.
	Rhodophyta indet. non calc
CHRYSOPHYTA	
	Diatoms – colonial
	Diatoms – film
PHAEOPHYTA	
	Alaria esculenta
	Ascophyllum nodosum

	Fucus ceranoides
	Fucus serratus
	Fucus sp. (sporelings)
	Fucus spiralis
	Fucus vesiculosus
	Halidrys siliquosa
	Himanthalia elongata
	Laminaria digitata
	Laminaria hyperborea
	Laminaria saccharina
	Laminaria sp.
	Leathisia difformis
	Pelvetia canaliculata
	Saccorhiza polyschides
	Scytosiphon lomentaria
CHLOROPHYTA	
	Bryopsis plumosa
	Chaetomorpha linum
	Chaetomorpha sp.
	Cladophera rupestris
	Cladophera sp.
	Codium sp.
	Prasiola stipitata
	Ulva sp.
ANGIOSPERMAE	
	Zostera angustifolia/
	Zostera noltei
LICHENS	
	Caloplaca marina sp.
	Grey lichens indet.
	Lecanora atra
	Lichina pygmaea
	Ramalina sp.
	Verrucaria maura
	Verrucaria mucosa

	Bifurcaria bifurcata
	Chorda filum
	Cladostephus spongiosus
	Colpomenia peregrina
	Cytoseira tamariscifolia
	Cytoseira sp.

	Xanthoria parietina
	Yellow lichens indet.