Thomson
environmental
consultants



Phase 1 Intertidal Habitat Survey

Donaghadee (Scot-NI 3 Landing Point)

For

Intertek

Project No.: AINT110/02

December 2020

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001	18/09/2020	Matthew Wisby & Dale Irvine	Daisy Chamberlain & Heather Clayson	Richard Arnold
002	04/12/2020	As above	As above	As above

Contents

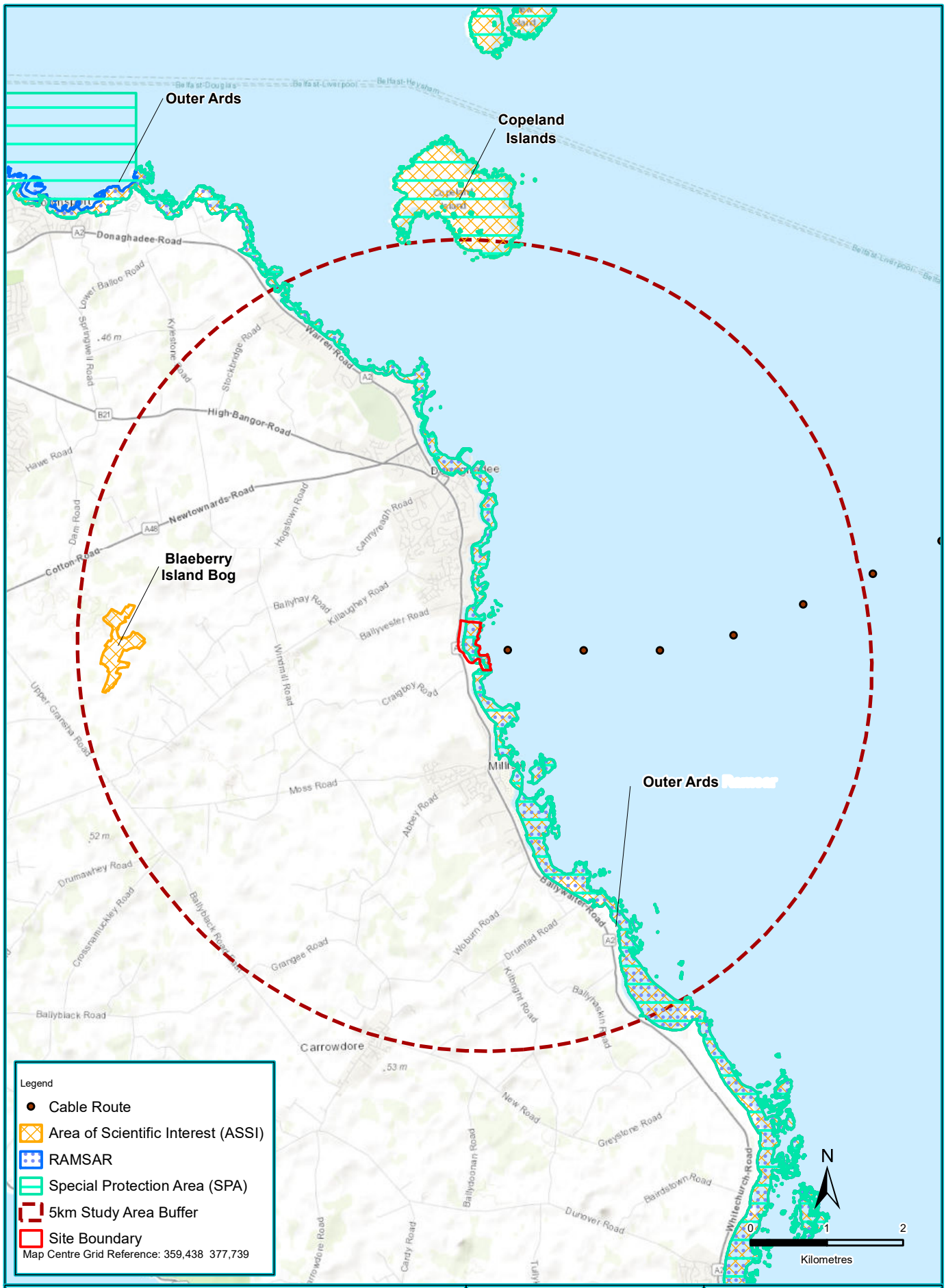
1. Summary and Main Recommendations

1.1 Summary

1.1.1 Intertek commissioned Thomson Environmental Consultants to undertake an Intertidal Phase 1 habitat survey for a proposed cable land point near Donaghadee, Northern Ireland (Grid ref: NW 72032 31031 (Irish grid reference: J 59378 77738)). The proposed cable route will connect Northern Ireland and Scotland, the landing point and survey area is shown on Figure 1. The site survey was completed on August 22nd 2020.

1.1.2 The main findings of the desk study were that the site lies within the Outer Ards SPA, Ramsar and ASSI. The site is also within 5km of the Copeland Islands SPA and ASSI, and the Blaeberry Island Bog ASSI. Records of nine protected species were identified within 2km of the site, including European otter (*Lutra lutra*) and a number of birds listed on Schedule 1 of the Wildlife (Northern Ireland) Order 1985 (as amended).

1.1.3 The field survey recorded and mapped 16 biotopes, shown on Figure 2, including one priority habitat: Intertidal under-boulder communities (A3.2112). No Annex I habitats were identified on site. Incidental species sightings were also recorded during the field survey and included two birds listed as principal interest/qualifying species for the Outer Ards Ramsar and SPA, European otter, common seal (*Phoca vitulina*), and knotted wrack (*Ascophyllum nodosum*) a priority species.



Filepath: S:\Guildford\Projects\AINT110 - Scotland Northern Ireland Fibre Optic Cable Intertidal Phase 1\Mapping\Working\AINT110_Fig1_SiteLocationandDeskStudyResults_LF_020920.mxd

Client: Intertek		Drawing Ref: AINT110/30468/1	
Figure Number: 1		Scale at A4: 1:68,000	
Figure Title: Site Location and Desk Study Results		Drawn: LF	Checked: EA
		Date: 02/09/2020	Date: 02/09/2020

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Filepath: S:\Guildford\Projects\AINT110 - Scotland Northern Ireland Fibre Optic Cable Intertidal Phase 1\Mapping\Working\AINT110_Fig2_Phase1Results_LF_080920.mxd

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Legend

- Photograph Location and Direction
- Target Note
- Artificial Boulders
- Cemetary
- Fucoids
- Kelp
- Lichens on Rock
- Littoral Rock
- Littoral Sand
- Littoral Shingle
- Rockpools

This map has been drawn at a sufficient level of accuracy to fulfil the requirements of a Phase 1 baseline habitat survey. The level of accuracy depends on both the size of the area involved and the base mapping. Every effort has been made to create a map that is as accurate as possible. However, this map is not intended to represent a scaled landscape survey so should not be used to pin-point accurate engineering work or as a basis for detailed site planning.

Map Centre Grid Reference: 359,475 377,730

Drawing Ref	AINT110/30505/1
Scale at A3	1:2,791
Drawn: LF	Checked: EA
Date: 10/09/2020	Date: 10/09/2020
Client	Intertek
Figure Number	2
Figure Title	Intertidal Phase 1 Survey

Photograph 1:
Talitrids on the upper shore and strand-line (A2.211)

Photograph 2:
Barren littoral coarse sand (A2.221)

Photograph 3:
Littoral sand and muddy sand (A2.2)

Photograph 4:
Close up of *Arenicola* casts in Littoral sand and muddy sand (A2.2)

Photograph 5:
Seaweeds in sediment-floored eulittoral rockpools (A1.413)

Photograph 6:
Hediste diversicolor was highly abundant, this area was defined as “Hediste-dominated gravelly sandy mud hores” (A2.41)

Client: Intertek		Drawing Ref: AINT110/305181	Thomson environmental consultants
Figure Number: Figure 3		Drawn: DI	Checked: MW
Figure Title: Photographs of the Site		Date: 10/09/2020	

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Client: Intertek		Drawing Ref: AINT110/30519/1	Thomson environmental consultants
Figure Number: Figure 4		Drawn: DI	Checked: MW
Figure Title: Photographs of the Site		Date: 10/09/2020	www.thomsonec.com enquiries@thomsonec.com

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Barren littoral shingle (A2.111)

Photograph 14:
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Client: Intertek		Drawing Ref: AINT110/30520/1	Thomson environmental consultants www.thomsonec.com enquiries@thomsonec.com
Figure Number: Figure 5		Drawn: DI	Checked: MW
Figure Title: Photographs of the Site		Date: 10/09/2020	

2. Introduction

2.1 Development Background

2.1.1 Intertek is involved in the development of a proposed Scotland - Northern Ireland 3 & 4 submarine fibre optic cable system consisting of two links from Scotland to Northern Ireland. As part of the preliminary works, six proposed landing points (LPs) were identified in each nation as part of the site visit prior to a preferred LP being chosen for each link. Landing point 3 is located approximately 2.3km south of Donaghadee, at grid reference: NW 72032 31031 (Irish grid reference: J 59378 77738). Site visits for all proposed landing points were undertaken by Global Marine in February 2020 and detailed in their Site Visit report issued in March 2020 (Global Marine, 2020).

2.1.2 The preferred landing point for Scot-NI 3 in Northern Ireland is south of the town of Donaghadee in Ards. It is the existing landing of the Scot-NI 1 cable, the Beach Man Hole (BMH) for which is located in the seaward side of a pavement along the coastal road, around 3m above the shoreline. It is expected that the Scot-NI 3 cable will share this BMH and British Telecom indicated that there is a spare duct from the BMH to the beach that could be used.

2.1.3 The beach at the landing point is rocky and pebbly and is backed by a bank of cobbles. To the north is a rocky promontory that hosts a large rockpool. The new cable will need to be landed in a relatively clear area around 100m south of the Scot-NI 1 LP. The cable will then need to cross the beach via a quadrant to the existing BMH.

2.1.4 It is understood that the project is classified as a permitted development and does not require planning permission.

2.1.5 The proposals described above are hereafter referred to collectively as the development.

2.1.6 The development will be located at the intertidal areas around the cable landing corridor of proposed cable landfall location at Donaghadee in Northern Ireland. The area affected by the development is hereafter referred to as the site.

2.2 The Brief and Objectives

2.2.1 Intertek have commissioned Thomson environmental consultants to undertake a Phase 1 habitat survey of the intertidal areas around the cable landing corridor of proposed cable landfall location at Donaghadee in Northern Ireland. The scope of works is detailed below:

- The survey area will encompass the cable corridor, a width of approximately 500m (centred on the centreline; 250m either side of the cable). Habitats and species observed in the survey area will be recorded and mapped and the potential for habitats on site to support protected species will be assessed. An assessment for EC Habitats Directive Annex I listed habitats or other protected / sensitive habitats and species will be undertaken. Photographs will be taken to aid the field survey. This will provide visual information to support the identification of biotopes. The surveys will be undertaken during low tide conditions where possible (and when in daylight hours) to ensure the survey area to be assessed can be maximised. The cost also includes an ecological desk study to collate available records for designated sites, important habitats and protected species.

- We will produce a combined technical report for the desk study and extended Phase 1 habitat survey for the site, detailing and mapping the biotopes/habitats present. The report will include an introduction, methodology, results and appropriate digitised mapping.

2.3 Limitations

2.3.1 Intertidal Phase 1 surveys should be conducted between April and October, as this is the period with the most faunal and floral growth on the shoreline. The survey was conducted during spring tides on the 22nd August, during this window. Conducting the survey over spring tides ensures that the greatest extent of the intertidal area possible is exposed during low tide periods, thus maximising the area visible for mapping. However, Storm Ellen hit Northern Ireland on the 19th of August, a few days prior to the survey, bringing very high winds and an extreme high tide, which lead to large amounts of displaced seaweed being scattered throughout the shoreline. This obscured the underlying biotopes in some areas.

2.3.2 The terrestrial Handbook for Phase 1 habitat survey (JNCC, 1993) only has broad categories for the intertidal area, which are inadequate to map the full range of intertidal habitats. Therefore, the marine intertidal survey methodology described by Wyn et al. (2000) was adopted, to give a greater level of detail than a terrestrial Phase 1. However, identification of soft sediment biotopes was inherently limited by the Phase 1 style of the survey, as this does not allow for the production of comprehensive species lists. Full characterisation of soft sediments requires a Phase 2 level survey, which involves the collection of quantitative core samples and subsequent laboratory processing to identify all infaunal species and for granulometric analysis.

2.3.3 This report is based on the development boundary and layout received from Paula Daglish on 3rd September 2020. Subsequent changes to either may result in a requirement to reassess the potential impacts of the development and the requirements for avoidance, mitigation and enhancement.

2.4 Surveyors

2.4.1 The Phase 1 intertidal habitat survey was undertaken by Dale Irvine MMbiol and Matthew Wisby MSc BSc ACIEEM.

3. Methodology

3.1 Desk Study

3.1.1 A study area was defined as an area that encompassed the site and all land within 5km of the perimeter of the site, see Figure 1. Records of designated sites and important species were then sought for the study area.

3.1.2 Sources of information were as follows:

- The Department of Agriculture, Environment and Rural Affairs (DAERA-NI)
- The Centre for Environmental Data and Recording (CEDaR - National Museums NI)

3.1.3 Records of designated sites were sought for the full study area, whereas records for species were sought for part of the study area encompassing the site and within 2km of the perimeter of the site.

3.1.4 Requests for information were to the Biological Record Centre sent on 8th August 2020.

3.2 Field Survey

3.2.1 The survey area was defined as an area that encompassed the proposed cable landing site with a 250m buffer on either side and ranged from Extreme Low Water Spring (ELWS) to Extreme High Water Spring (EHWS). The survey area is shown on Figure 2.

3.2.2 Prior to the survey, satellite imagery was used to identify possible biotope boundaries. These were used to produce a wireframe map and to familiarise the surveyors with the area, ensuring that the survey could be conducted in a time efficient manner.

3.2.3 The survey was conducted on the 22nd of August 2020 to coincide with an ebbing spring tide during daylight hours. The tide reached its lowest point of 0.2m at 08:14. The site was accessed via public footpaths from a nearby carpark.

3.2.4 The survey methodology followed guidelines set out in the Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey (Wyn et al., 2000) for surveying rocky and sediment shores from the splash zone down to the lower shore. The basic recording unit is the biotope from the Marine Habitat Classification for Britain and Ireland (Connor et al., 2004). A biotope is defined as the combination of abiotic physical characteristics of a habitat (e.g. substratum, wave exposure) and its associated biological community of species.

3.2.5 Biotopes were cross referenced to the Classification of habitat types according to Annex I to Directive 92/43/EEC (EC, 2013) to identify any Annex I habitats on site.

3.2.6 In the field, the wireframe map was used to quickly identify areas of differing habitat to and begin mapping the separate biotopes. The extent of each biotope was mapped using ARC Collector on a Toughpad by walking the boundaries of the biotopes. Geo-tagged photos were taken of each biotope. Dominant and noteworthy species were recorded as target notes, as were any notable features and incidental patches of <5x5m (the minimum size of a biotope).

3.2.7 On sandy sections, periodic digging was carried out and sediment was passed over a 0.5mm sieve. Fauna retained on the sieve were identified to the lowest level possible in the field and returned to their original location.

3.2.8 Records were made of any incidental fauna encountered during the survey.

4. Results

4.1 Background

4.1.1 The contents of the results section are the factual results of the desk study and Phase 1 intertidal habitat survey. Excluded from this section is the assessment of the site to support species of conservation concern not recorded during the survey.

4.2 Desk Study

4.2.1 Data were received from CEDaR on 26th August 2020.

4.2.2 The results are summarised below and the locations of designated sites and selected species of conservation concern are shown on Figure 1.

Designated Sites

4.2.3 A total of three designated sites were identified within 5km of the site. These include Ramsar sites, Special Protection Areas (SPAs) and Areas of Special Scientific Interest (ASSIs). Details of the designated sites are summarised in Table 1 below.

Table 1 Designated sites

Site Designation	Grid Reference	Area (ha)	Distance to site (km)	Description
International Sites (SPA, SAC and Ramsar)				
Outer Ards Ramsar, SPA, ASSI	NW 747 223 (NI Grid ref. J 62781 69265)	Ramsar: 1278.82 SPA: 1410.41 ASSI: 1116.16	0km	The Outer Ards extend from Grey Point on the north Down coast to Ballyquintin Point in the South. The site mainly encompasses the intertidal area including mud and sand dominated by shores, cobble and boulder beaches and rocky shores. The qualifying features of interest are the breeding colonies of artic tern (*Sterna paradisaea*) and Manx shearwater (*Puffinus puffinus*) together with wintering populations of light-bellied brent goose (*Branta bernicla*), golden plover (*Pluvialis apricaria*), turnstone (*Arenaria interpres*) and ringed plover (*Charadrius hiaticula*).

Site Designation	Grid Reference	Area (ha)	Distance to site (km)	Description
				The boundary of the Ramsar site is entirely coincident with the Outer Ards ASSI and Ballymacormick Point ASSI (DAERA, 2005). The boundary of the SPA is entirely coincident with the Outer Ards ASSI and Ballymacormick Point ASSI and includes open marine areas (DEARA, 2002)
Copeland Islands SPA, ASSI.	NW 733 382 (NI Grid Ref. J 60028 84988)	201.52	4.73	The Copeland Islands site comprises three islands (Copeland Island, Lighthouse Island and Mew Island) together with associated islets off the north-east Co. Down coast. It includes rocky shores together with limited areas of sand/mud and cobble/boulder beaches. Terrestrial habitat include saltmarsh, freshwater marsh, maritime grassland, limited extent of inland cliff and semi-improved agricultural grassland. The qualifying features are the breeding colonies of Manx shearwater and arctic tern. The boundary of the SPA is entirely coincident with the Copeland Islands ASSI. (DAERA, 2010_a).
National Sites (ASSIs)				
Blaeberry Island Bog ASSI	NW 673 313 (NI Grid Ref. J 54700 77700)	25.48	4.11	Designated for regional extent of intact and active cutover bog in Northern Ireland. Supports unique vegetation communities that are irreplaceable including the nationally rare golden bog-

Site Designation	Grid Reference	Area (ha)	Distance to site (km)	Description
				moss (*Sphagnum pulchrum*). (DAERA, 2010b)

Annex I Habitats

4.2.4 Information on Annex I habitats was not available from desk study resources so an assessment for these habitats were made on site.

Priority Habitats outside designated sites

4.2.5 No priority habitats within the site or within 5km of the site perimeter were located from the desk study.

Protected Species

4.2.6 Records of nine protected species were identified within 2km of the survey area. These included three Annex 1 birds listed as species of principal importance/qualifying interest for the Outer Ards Ramsar and SPA (respectively). Three records of European otter were returned, and eight bird species listed on Schedule 1 of the Wildlife (Northern Ireland) Order 1995 (as amended). A summary of these results is shown in Table 1 below, only records of species closest to the site are shown.

Other Species of Conservation Concern

4.2.7 A total of eight Northern Ireland Priority Species were identified within 2km of the site, and 16 birds of conservation concern, shown in Table 2 below.

Table 2 Species records derived from the desk study

Common name	Latin Name	HSR Sch[1] 2 or 3	WO[2] Sch1 or 5	Annex I[3] Birds	Northern Ireland Priority Species[4]	Red Data Book/ BoCC[5]	Grid Reference	Distance from site (km)
Mammals								
Otter	*Lutra lutra*	Schedule 2	Schedule 5		✓		J586808	1.23
Birds								
Arctic skua	*Stercorarius parasiticus*				✓	Red	J5980	1.95
Common black-headed gull	*Chroicocephalus ridibundus*				✓	Amber	J589799	1.87
Common scoter	*Melanitta nigra*		Schedule 1		✓	Red	J5980	1.95
Curlew	*Numenius arquata*		Schedule 1		✓	Red	J5963079306	1.27
Dunlin	*Calidris alpina*		Schedule 1		✓	Amber	J5980	1.95
Eider	*Somateria mollissima*					Amber	J5980	1.95
Glaucous gull	*Larus hyperboreus*					Amber	J594793	1.24
Great northern diver	*Gavia immer*					Amber	J594793	1.24
Kittiwake	*Rissa tridactyla*					Red	J5980	1.95
Pale-Bellied Brent Goose	*Branta bernicla* subsp. *hrota*			✓ (Outer Ards	✓		J5976	1.52

[1] The Conservation (Natural Habitats etc.) Regulations (Northern Ireland) 1995, as amended
[2] The Wildlife (Northern Ireland) Order 1985, as amended
[3] Bird species listed on Annex I of the Birds Directive
[4] Species of Principal Importance for Northern Ireland.
[5] Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man

Common name	Latin Name	HSR Sch[1] 2 or 3	WO[2] Sch1 or 5	Annex I[3] Birds	Northern Ireland Priority Species[4]	Red Data Book/ BoCC[5]	Grid Reference	Distance from site (km)
				Ramsar & SPA)				
Manx shearwater	*Puffinus puffinus*		Schedule 1	✓ (Outer Ards Ramsar)		Amber	J5980	1.95
Mediterranean gull	*Larus melanocephalus*		Schedule 1			Amber	J5980	1.95
Purple sandpiper	*Calidris maritima*					Amber	J594799	1.84
Red-throated diver	*Gavia stellata*		Schedule 1				J594793	1.24
Sandwich tern	*Sterna sandvicensis*		Schedule 1			Amber	J5980	1.95
Shelduck	*Tadorna tadorna*					Amber	J594793	1.24
Turnstone	*Arenaria interpres*			✓ (Outer Ards Ramsar & SPA)		Amber	J594793	1.24
Whimbrel	*Numenius phaeopus*		Schedule 1		✓	Red	J594793	1.24

4.3 Field Survey

Site description

4.3.1 The distribution of biotopes and lifeform groups are show on Figure 2.

4.3.2 The northern region of the survey site had large artificial boulders at the upper limit of the shore. Below the boulders was a sandy shore, which transitioned to two large permanent pools in the mid-shore. Further down, the low shore consisted of a large boulder field covered in fucoid algae. This boulder field also contained small sections of exposed bedrock.

4.3.3 Moving south, the bay became gravellier, with patches of mixed sediment including large boulders on sand. The mid-shore was again characterised by boulders covered in fucoid algae with a patch of exposed bedrock. The southern end of the bay had a smaller stretch of sand, which transitioned into a barren shingle beach.

4.3.4 There were extensive kelp beds in the sublittoral fringe, at the edge of the intertidal zone, throughout the survey area.

4.3.5 The southernmost region of the survey area is a small headland of exposed bedrock. The upper limits of the bedrock were colonised by a mixture of yellow and grey lichen, with some small rockpools dominated by ephemeral green algae. Below this, the rock was covered in tar lichen with patches of algae and barnacles. Patches of fucoids, barnacles and limpets were present on the mid-shore rock. The lower shore was dominated by kelp and a mixture of fucoid algae species, which could be seen in the bottom of gullies running perpendicular to the coastline.

Biotopes

4.3.6 A total of 16 biotopes were described within the survey area. These biotopes are described below, listed in Table 3 and their distribution shown in Figure 2.

Talitrids on the upper shore and strand-line

4.3.7 On the upper shore was a strandline of dried seaweed with talitrid amphipods which ran along the length of the shore from the northern extent of the survey area to the cemetery in the south, this biotope was classified as “Talitrids on the upper shore and strand-line” (A2.211, Figure 3, Photo 1).

Barren littoral coarse sand

4.3.8 Below the strand line, no fauna was observed on the surface or found when the sediment was sieved, therefore this area was classified as “Barren littoral coarse sand” (A2.221, Figure 3, Photo 2). This biotope extended south as far as the cemetery, with another patch at the south end of the bay.

Littoral sand and muddy sand

Within the barren coarse sediment were two small pockets of finer sediment containing casts of the lugworm *Arenicola*. A much larger band of this sediment ran along the majority of the survey site, slightly further down the shore. These areas were classified as "Littoral sand and muddy sand" (A2.2, Figure 3, Photos 3 & 4). A target note was made near the southern pocket for a patch of brown and green seaweed covered boulders (TN1).

Seaweeds in sediment-floored eulittoral rockpools

4.3.9 Two large rockpools in the mid-shore were defined as "Seaweeds in sediment-floored eulittoral rockpools" (A1.413, Figure 3, Photo 5). These pools contained a range of seaweeds including kelp (*Laminaria digitata*), fucoids (*Fucus serratus* and *F. vesiculosus*), encrusting red algae and the green algae *Ulva intestinalis.* Observed fauna included the gastropod snails *Littorina* and *Trochidae,* and casts of the lugworm *Arenicola*.

Hediste-dominated gravelly sandy mud shores

4.3.10 Near the southern pool was a patch of mixed sediment with *Ulva intestinalis,* where the ragworm *Hediste diversicolor* was highly abundant, this area was defined as "*Hediste*-dominated gravelly sandy mud shores" (A2.41, Figure 3, Photo 6).

Fucus vesiculosus and barnacle mosaics on moderately exposed mid eulittoral rock

4.3.11 The shore below the rockpools consisted of rocks of various sizes covered in fucoid algae with occasional barnacles and limpets (*Patella* sp.). This biotope was defined as "*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock" (A1.213, Figure 4, Photo 7). There was a second area of this biotope slightly further south; together they comprised the majority of the mid-shore throughout the site.

Laminaria digitata and under-boulder fauna on sublittoral fringe boulders

4.3.12 Low down the shore, the sublittoral fringe was dominated by kelp (*Laminaria digitata)* with patches of the fucoid *Fucus serratus* and small foliaceous and encrusting red algae on the rocks. This biotope was classified as "*Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders" (A3.2112, Figure 4, Photo 8) and extended throughout the length of the survey area at the start of the sublittoral zone.

Mussel and/or barnacle communities

4.3.13 In the mid-shore there were sections of raised, exposed bedrock with sparse patches of barnacles and limpets (*Patella* sp.). The beadlet anemone *Actinia equina* and the dogwhelk *Nucella lapillus* were present in crevices between the rock. This biotope was defined as "Mussel and/or barnacle communities" (A1.11, Figure 4, Photo 9) and occurred at 4 locations in the northern half of the survey site.

Ephemeral green or red seaweed communities (freshwater or sand-influenced)

4.3.14 In the mid-shore of the central section of the survey area there was a band of sand with cobbles covered by a mixture of ephemeral algae, including *Ulva intestinalis*. This area was classified as "Ephemeral green or red seaweed communities (freshwater or sand-influenced)" (A1.45, Figure 4, Photo 10), due to the sand influence and relatively sparse fauna. The gastropod snail *Littorina* and casts of the lugworm *Arenicola* were also present.

Yellow and grey lichens on supralittoral rock

4.3.15 The upper shore directly below the cemetery was mainly exposed bedrock, the upper reaches of which were covered in lichens and given the biotope "Yellow and grey lichens on supralittoral rock" (B3.111, Figure 4, Photo 11).

Fucus vesiculosus on mid eulittoral mixed substrata

4.3.16 Below this area was a patch of sand/mud with large cobbles and boulders covered in *F. vesiculosus*. Barnacles and the gastropod snail *Littorina* were also present. This biotope was defined as *"Fucus vesiculosus* on mid eulittoral mixed substrata" (A1.3132, Figure 4, Photo 12). A second area of this biotope was present slightly lower on the shore surrounding an area of raised bedrock.

Fucus vesiculosus and barnacle mosaics on moderately exposed mid eulittoral rock

4.3.17 The upper shore in the south of the bay contained no obvious fauna and was defined as "Barren littoral shingle" (A2.111, Figure 5, Photo 13), with a second area of "Barren littoral coarse sand" (A2.221) below it. In the mid-shore, below the continuing "*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock" (A1.213), was a sandy area dominated by tubes of the sand mason worm *Lanice conchilega,* which was classified as "*Lanice conchilega* in littoral sand" (A2.245, Figure 5, Photo 14).

Pelvetia canaliculata and barnacles on moderately exposed littoral fringe rock

4.3.18 The southernmost region of the survey area is a small headland of exposed bedrock which displays clear zonation with a second, more extensive area of yellow and green lichen covered rocks in the upper shore (biotope B3.111). Towards the south end of this biotope was a small rockpool dominated by green algae (TN2) the pool was too small qualify as a biotope and was therefore marked as a target note, Below this, the rock was covered in black tar lichen (*Verrucaria maura*) with patches of the wrack *Pelvetia canaliculata* and barnacles. This zone was characterised as "*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock" (A1.211, Figure 5, Photo 15). This biotope contained two small rockpools recorded as target notes, one deep rockpool dominated by a mixture of fucoids and kelp (TN3) the other was dominated by *Fucus serratus* (TN4).

Barnacles and fucoids on moderately exposed shores

4.3.19 The bedrock in the mid-shore of the southern end of the survey site showed a high percentage of barnacle cover where the rock was angled obliquely to the waves and was dominated by a mixture of fucoids where sheltered. This area was classified as "Barnacles and fucoids on moderately exposed shores" (A1.21, Figure 5, Photo 16).

Fucoids and kelp in deep eulittoral rockpools

4.3.20 One large, deep rockpool was located inside this biotope, the deeper sections of which contained kelp and large fucoids (*F. serratus* and *F. vesiculosus*), encrusting red algae, limpets (*Patella* sp.) and the beadlet anemone (*A. equina)*. This biotope was defined as "Fucoids and kelp in deep eulittoral rockpools" (A1.412, Figure 5, Photo 17).

4.3.21 The shoreline in this area also included several infra-littoral gullies running perpendicular to the coast, which were dominated by kelp (*Laminaria digitata*) and large brown seaweeds including *Fucus serratus* and *Himanthalia elongata*. The limpet (*Patella sp.)* and encrusting red algae were also present (Figure 5, Photo 18).

Table 3. Biotopes identified in the survey area

EUNIS Code	Biotope Name (JNCC 04.06)	JNCC Code	Notes	Lifeform group
A1.11	Mussel and/or barnacle communities	LR.HLR.MusB	Fauna: *Patella, Actinia equina, Nucella lapillus, Semibalanus balanoides, Chthamalus.*	Littoral Rock
A1.21	Barnacles and fucoids on moderately exposed shores	LR.MLR.BF	Algae: *Fucus vesiculosus* Fauna: *Patella*	Littoral Rock
A1.211	*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock	LR.MLR.BF.Pel	Algae: *Pelvetia canaliculata* Fauna: *S. balanoides, Chthamalus*	Fucoids
A1.213	*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock	LR.MLR.BF.FvesB	Algae: *F. vesiculosus* Fauna: *Patella, S. balanoides*	Littoral Rock
A1.3132	*Fucus vesiculosus* on mid eulittoral mixed substrata	LR.LLR.F.Fves.X	Algae: *F.vesiculosus, Ulva intestinalis* Fauna: *Littorina, S. balanoides, Chthamalus*	Fucoids
A1.412	Fucoids and kelp in deep eulittoral rockpools	LR.FLR.Rkp.FK	Algae: *Fucus serratus F.vesiculosus Laminaria digitata,* encrusting red algae Fauna: *Patella, Actinia equina, Nucella lapillus*	Rockpools
A1.413	Seaweeds in sediment-floored eulittoral rockpools	LR.FLR.Rkp.SwSed	Algae: encrusting red algae, *Laminaria digitata, Fucus serratus, Fucus vesiculosus, Ulva intestinalis* Fauna: *Littorina, Trochidae, Arenicola* casts	Rockpools
A1.45	Ephemeral green or red seaweed communities (freshwater or sand-influenced)	LR.FLR.Eph	Algae: *Ulva intestinalis* Fauna: *Arenicola* casts	Littoral Rock

A2.111	Barren littoral shingle	LS.LCS.Sh.BarSh	No fauna or algae observed	Littoral shingle
A2.2	Littoral sand and muddy sand	LS.LSa	Fauna: *Arenicola* casts	Littoral sand
A2.211	Talitrids on the upper shore and strand-line	LS.LSa.St.Tal	Fauna: Talitrid amphipods	Littoral sand
A2.221	Barren littoral coarse sand	LS.LSa.MoSa.BarSa	No fauna or algae observed	Littoral sand
A2.245	*Lanice conchilega* in littoral sand	LS.LSa.MuSa.Lan	Fauna: *Lanice conchilega*	Littoral sand
A2.41	*Hediste*-dominated gravelly sandy mud shores	LS.LMx.GvMu	Algae: *Ulva intestinalis* Fauna: *Hediste diversicolor*	Littoral sand
A3.2112	*Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders	IR.MIR.KR.Ldig.Bo	Algae: *Fucus serratus, Laminaria digitata,* encrusting red algae Fauna: *Littorina, Spirobinae*	Littoral Rock
B3.111	Yellow and grey lichens on supralittoral rock	LR.FLR.Lic.YG	No fauna or algae observed	Littoral Rock

Incidental Fauna Records

4.3.22 A number of species were recorded foraging within the survey area, listed in Table 4 below.

Table 4. Incidental species sightings

Common Name	Latin name	Protected Species	Northern Ireland Priority Species
Common seal	*Phoca vitulina*	Sch 3 HSR, Sch 5, 6 & 7 WO	✓
European otter	*Lutra lutra*	Sch 2 HSR, Sch 5 WO	✓
Ringed plover	*Charadrius hiaticula*	Annex I	
Razorbill	*Alca torda*		
Redshank	*Tringa totanus*		✓
Curlew	*Numenius arquata*	Sch 1 WO	✓
Cormorant	*Phalacrocorax carbo*		
Herring gull	*Larus argentatus*		✓
Greater black-backed gull	*Larus marinus*		
Black-headed gull	*Chroicocephalus ridibundus*		✓
Sandwich tern	*Sterna sandvicensis*		
Turnstone	*Arenaria interpres*	Annex I	
Oystercatcher	*Haematopus ostralegus*		
Grey heron	*Ardea cinerea*		
Rock Pipit	*Anthus petrosus*		
Knotted wrack	*Ascophyllum nodosum*		✓

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