XLINKS' MOROCCO-UK POWER PROJECT

Environmental Statement

Volume 3, Appendix 1.1: Offshore Intertidal Survey Report

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APEM

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Acronyms

Acronym	Definition
DRA	Dynamic Risk Assessment
EIA	Environmental Impact Assessment
EUNIS	European Nature Information System
HDD	Horizontal Directional Drilling
HOCI	Habitats of Conservation Importance
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
MCZ	Marine Conservation Zone
MHW	Mean High Water
MLW	Mean Low Water
OCC	Offshore Cable Corridor
PPE	Personal Protective Equipment
PLONOR	Pose Little Or No Risk to the environment
SOCI	Species of Conservation Importance
SRA	Site Risk Assessment
SSSI	Site of Special Scientific Interest
UTC	Universal Time Coordinated
TBT	Tributyltin
UK	United Kingdom
ZoI	Zone of Influence

1 APPENDIX 1.1: OFFSHORE INTERTIDAL SURVEY REPORT

1.1 Introduction

1.1 This document forms Volume 3, Appendix 1.1: Offshore Intertidal Survey Report of the Environmental Statement (ES) prepared for the United Kingdom (UK) elements of Xlinks' Morocco-UK Power Project (the 'Project'). For ease of reference, the UK elements of the Project are referred to in this report as the 'Proposed Development', which is the focus of the ES. The ES presents the findings of the Environmental Impact Assessment (EIA) process for the Proposed Development.

1.2 The Proposed Development forms part of the wider Project proposed by the Applicant to develop a sub-sea electricity supply project from Morocco to the UK. The Project includes an electricity generation facility entirely powered by solar and wind energy combined with a battery storage facility. Located in Morocco's renewable energy rich region of Guelmim Oued Noun, the Applicant proposes to install approximately 11.5 Gigawatts peak (GWp) of renewable energy capacity that would cover an approximate area of 1,500 km^2 and connect exclusively to Great Britain (GB) via four HVDC sub-sea cables, with a total offshore route between Morocco and the UK of approximately 4,000 km.

1.1.1 The offshore elements of the Proposed Development in UK waters will be undertaken within the Offshore Cable Corridor. The extent of the Offshore Cable Corridor is from the UK exclusive economic zone (EEZ) boundary to the landfall site at Cornborough Range on the north Devon coast. The total length of the Offshore Cable Corridor in UK waters is approximately 370 km. The Proposed Development involves Horizontal Directional Drilling (HDD) under the intertidal zone. The HDD will be physically separated from the intertidal zone (HDD boreholes will be c.20 m below seabed level) and the (marine) exit points will be located offshore (between approximately 500 and 1800 m offshore). Consequently, there is not anticipated to be any direct physical interactions between the Proposed Development and the intertidal zone. However, there is a very low potential risk of bentonite break out during the HDD activity.

1.1.2 Consequently, site characterisation of the intertidal area was required to inform assessment of potential effects of the Proposed Development on intertidal species/habitats. This report outlines the results of an intertidal ecological survey conducted at the landfall location of the Proposed Development.

Scope

1.1.3 The purpose of the survey was to determine the intertidal biotope composition, biotope distribution, extent of sub-features and notable biotopes within the proposed intertidal portion of the Offshore Cable Corridor (at the landfall) with the aim of achieving 100% coverage of the shore between mean high water (MHW) and mean low water (MLW).

Survey Location

1.1.4 The survey area comprised a 700 m wide corridor (the 500 m OCC / landfall corridor) with an additional 100 m buffer zone either side), (**Figure 1**). The survey area overlaps the Mermaid's Pool to Rowden Gut Site of Special Scientific Interest (SSSI) and is 1 km southeast of the Westward Ho! Cliffs SSSI; these SSSIs are both designated for features of geological interest only. The OCC is also 500 m south of the Bideford to Foreland Point Marine Conservation Zone (MCZ) which is designated for a number of Species and Habitats of Conservation Interest (SOCI, HOCI) (**Figure 1**). A preliminary MCZ Assessment for the Proposed Development has been prepared (APEM, 2024). All of the potential impacts identified for the Bideford to Foreland Point MCZ were screened out during the Stage 1 assessment with no significant impacts anticipated.

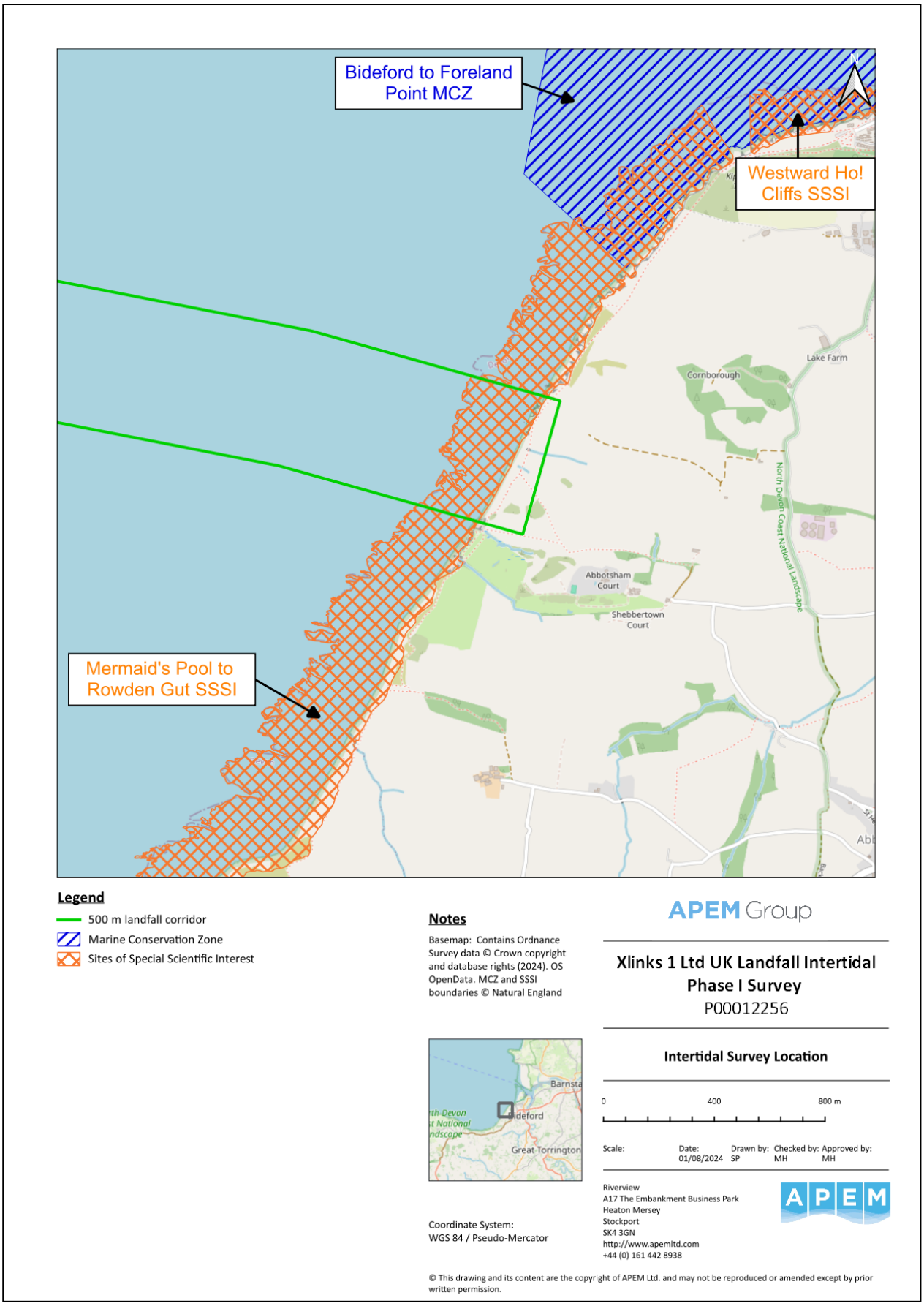

Figure 1.Survey location in relation to nearby designated sites.

1.2 Methodology

Overview of survey design

1.2.1 The survey was undertaken in accordance with best practice guidance including Davies *et al*. (2001), Wyn *et al*. (2006), JNCC (2010), Saunders *et al*. (2011), Noble-James *et al*. (2018), and Natural Resources Wales (2019a & 2019b). The survey design aimed to obtain standardised information on the presence and extent of habitats (e.g. broadscale habitats, biotope complexes, biotopes, sub-biotopes) within the survey area including the production of habitat maps.

Phase I methodology

1.2.2 The intertidal Phase I survey was carried out between MHW and to determine the distribution and extent of habitats present with the aim of achieving 100% coverage of the shore within the survey area. All accessible soft and hard substrates within the proposed survey area were included during the Phase I survey.

1.2.3 Habitat codes were assigned in the field according to the Joint Nature Conservation Committee (JNCC) National Marine Habitat Classification for Britain and Ireland: Version 04.05 (JNCC, 2022) and the EUNIS classification system (EUNIS, 2022).

1.2.4 For each habitat/biotope, surveyors recorded:

- Notes relating to the biotic assemblage including key taxa present when applicable;
- Substrate type;
- Wave exposure;
- Shore type;
- Presence of rockpools;
- Anthropogenic pressures; and
- Key features of interest.

1.2.5 Photographs of each habitat or feature of interest were taken, including conspicuous species. A hand-held GPS was carried throughout the survey to accurately plot waypoints of the features and biotopes to inform subsequent mapping.

1.2.6 Quadrats were used to provide quantitative assessments of species composition at sampling stations to help refine biotopes. At each quantitative survey station, one randomly placed 50 x 50 cm (0.25 m^2) quadrat was surveyed. The abundances of all species within the quadrat were recorded. For algae and encrusting organisms (including barnacles) percentage cover of the quadrat were estimated, for other species the numbers of individuals within the quadrat were counted.

Survey timings

1.2.7 The intertidal survey work was planned to coincide with spring tides to allow the maximum extent of the shore at each survey location to be surveyed. The survey work was carried out between 24th and 26th June 2024. The tide times, heights and times of sunrise and sunset are presented in **Table 1**.

Table 1. Times of low tide, sunrise, sunset and tide heights during the survey.

Date	Low Tide (UTC)	Tide Height (m)	Sunrise (UTC)	Sunset (UTC)
24th June 2024	13:51	0.0	04:03	20:35
25th June 2024	14:35	0.0	04:03	20:35
26th June 2024	15:21	0.2	04:04	20:35

Health and safety

1.2.8 A Site Risk Assessment (SRA) was completed by the Marine Survey Manager in advance of the survey. This SRA was then reviewed and assessed by APEM's H&S Lead. In addition, a daily Dynamic Risk Assessment (DRA) was carried out by the lead surveyor on site prior to the commencement of any fieldwork and during the survey as required, to identify any additional H&S concerns that were not covered in the original SRA.

1.2.9 The primary H&S concerns were the risk of becoming trapped by incoming tides and exposure risks. Both members of the survey team staff wore appropriate Personal Protective Equipment (PPE) for fieldwork, including lifejackets and waterproofs to minimise exposure risks and carried a field first aid kit and throw rope.

1.2.10 Both members of the survey team were provided with the tidal information for the survey site, including the times of sunrise and sunset for each day, and these were carried at all times. Check-in and out calls were made to a designated office-based contact at previously agreed times, coinciding with expected times of starting and completing work each day.

1.3 Results

Health and safety incidents

1.3.1 There were no incidents, near misses or other health and safety issues to report under APEM's H&S procedures.

Site description

1.3.2 The survey site is a moderately exposed northwest-facing linear coastline backed by cliffs of sandstone, siltstone and clay with a ridge of sandstone cobbles beneath. Below the cobble ridge a wave-cut platform of sandstone bedrock extends out approximately 240 m to MLW, supporting assemblages of fucoids, barnacles, gastropods and crusts of the honeycomb worm *Sabellaria alveolata*.

Habitat distribution

1.3.3 A total of 13 habitats were recorded during the survey and their distribution is indicated in **Figure 2**. In the text, standard EUNIS (2022) habitat codes are provided in brackets after each habitat description, along with the equivalent JNCC biotope code (JNCC, 2022). The raw quadrat data are provided in **Annex 1**.

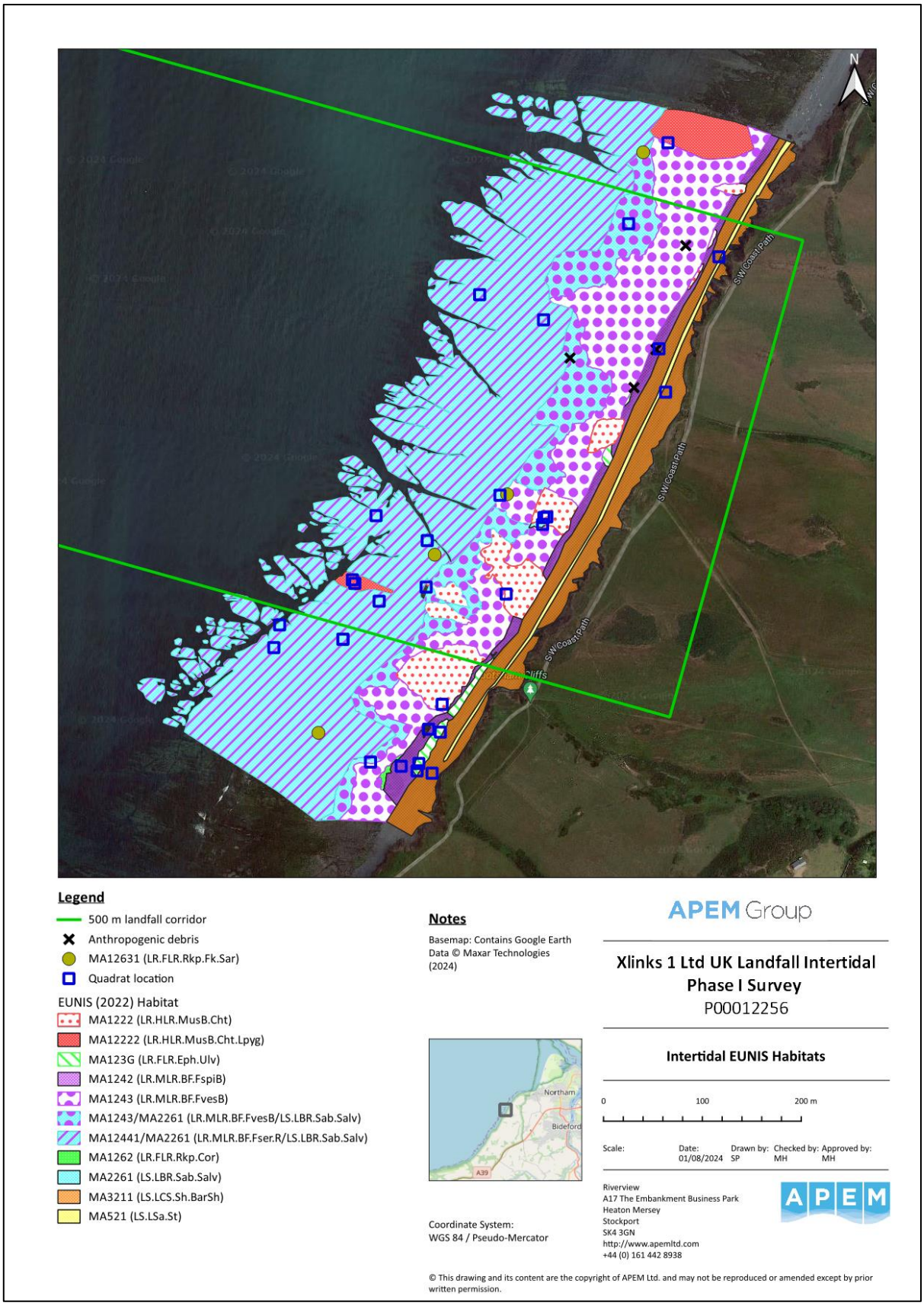

Figure 2. Distribution of habitats in the survey area.

1.3.4 The uppermost section of the littoral zone comprised a band of mobile cobbles and pebbles extending between 10 and 40 m from the cliffs at the top of the shore (**Figure 3**). There was no visible flora or fauna in quadrats in this habitat and it was assigned to the habitat 'Barren littoral shingle' (MA3211; LS.LCS.Sh.BarSh). Within this habitat there was a thin strandline approximately 0.5 m wide, formed of decomposing macroalgae, wood and anthropogenic debris (**Figure 4**) that was assigned to the habitat 'Strandline communities on Atlantic littoral sand' (MA521; LS.LSa.St).

Figure 3. Upper shore barren cobbles and pebbles (MA3211; LS.LCS.Sh.BarSh)

Figure 4. Strandline of washed-up algae, wood debris and anthropogenic waste (MA521; LS.LSa.St)

1.3.5 Below the ridge of cobbles and pebbles, on the uppermost extent of bedrock platform there was a band of spiral wrack *Fucus spiralis* and barnacles (*Chthamalus* spp.) along most of the length of the survey area (**Figure 5**). Quadrats sampled in this area indicated low abundances of the limpet *Patella vulgata* and the common periwinkle *Littorina littorea*. This habitat was assigned to '*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock' (MA1242; LR.MLR.BF.FspiB). This upper band of bedrock also included areas dominated by *Ulva intestinalis* where there were indications of freshwater input to the shore (**Figure 6**). Amongst *U. intestinalis* there were sparse fronds of *F. spiralis* and egg wrack *Ascophyllum nodosum* along with low numbers of the flat top shell *Steromphala umbilicalis.* This habitat was assigned to '*Ulva* spp. on freshwater-influenced and/or unstable upper eulittoral rock' (MA123G; LR.FLR.Eph.Ulv).

Figure 5. Upper shore bedrock with *Fucus spiralis* and *Chthamalus* spp. in Quadrat 21 (MA1242; LR.MLR.BF.FspiB)

Figure 6. *Ulva intestinalis* on upper shore bedrock (MA123G; LR.FLR.Eph.Ulv)

1.3.6 The majority of the mid shore bedrock platform alternated between a canopy of bladderwrack *Fucus vesiculosus* (**Figure 7**), or expanses of rock dominated by barnacles (mostly *Chthamalus* spp. with a few *Semibalanus balanoides* and sporadic individuals of *Austrominius modestus*) with only sparse algal cover (**Figure 8**). Beneath the *F. vesiculosus* canopy there were barnacles (*Chthamalus* spp.), encrusting coralline algae and *P. vulgata*. This habitat was assigned to '*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock' (MA1243; LR.MLR.BF.FvesB). The areas of barnacle-dominated bedrock had little other flora or fauna present, with sparse *F. vesiculosus* fronds, *P. vulgata* and *Littorina littorea* where there were crevices or pools amongst the bedrock. The black lichen *Verrucaria maura* was recorded in one quadrat on the upper extent of the bedrock platform. This habitat was assigned to '*Chthamalus* spp. on exposed upper eulittoral rock' (MA1222; LR.HLR.MusB.Cht).

Figure 7. Mid shore bedrock with *Fucus vesiculosus* in Quadrat 59 (MA1243; LR.MLR.BF.FvesB)

Figure 8. Mid shore bedrock dominated by *Chthamalus* spp. and sparse algal cover (MA1222; LR.HLR.MusB.Cht)

1.3.7 In the southern extent of the survey area there were two small areas of bedrock on the mid shore (approximately 14 m x 7 m) dominated by the egg wrack *A. nodosum* with epiphytic *Vertebrata lanosa* (**Figure 9**). Quadrats sampled in this habitat found low numbers of *P. vulgata*, *G. umbilicalis* and the beadlet anemone

Actinia equina beneath the canopy. This habitat was assigned to '*Ascophyllum nodosum* on full salinity mid eulittoral rock' (MA123E1; LR.LLR.F.Asc.FS) (these areas are too small to see on **Figure 2**). *A. nodosum* was also interspersed amongst the fucoids elsewhere on the bedrock platform, but with a patchy distribution and not as the dominant canopy forming species. On the mid shore at the northern end of the survey area and towards the lower shore near the southern boundary of the proposed landfall corridor (see **Figure 2**) there were some elevated strata of vertical bedrock. The vertical faces were dominated by 50-80% cover of the barnacles *Chthamalus* spp., with some *Semibalanus balanoides* and sporadic individuals of *Austrominius modestus* (**Figure 10**). The steeper elevation and presence of the lichen *Lichina pygmaea* made this habitat distinct from the flatter bedrock platform and it was assigned to the habitat '*Chthamalus* spp. and *Lichina pygmaea* on steep exposed upper eulittoral rock' (MA12222; LR.HLR.MusB.Cht.Lpyg).

Figure 9. *Ascophyllum nodosum* habitat on upper/mid shore where Quadrat 19 was sampled (MA123E1; LR.LLR.F.Asc.FS)

Figure 10. Vertical bedrock with *Chthamalus* spp., *Semibalanus balanoides* and *Lichina pygmaea* (MA12222; LR.HLR.MusB.Cht.Lpyg)

1.3.8 Across the whole of the bedrock platform there were scattered rockpools in depressions and crevices in the bedrock interspersed amongst the fucoid and barnacle habitats. These were too numerous and variable in size to map individually. Most of the smaller shallow pools were covered with encrusting coralline algae and included red algal species such as *Chondrus crispus*, *Corallina officinalis*, *Hildenbrandia rubra*, the brown alga *Ectocarpus* spp. and the gastropods *L. littorea*, *P. vulgata* and *S. umbilicalis* (**Figure 11**). These pools were assigned to the habitat 'Coralline crust-dominated shallow eulittoral rockpools' (MA1262; LR.FLR.Rkp.Cor). Some of the larger upper shore pools were distinguished by an abundance of the brown algal species *Bifurcaria bifurcata*. These were assigned to the habitat '*Bifurcaria bifurcata* in shallow eulittoral rockpools' (MA12623; LR.FLR.Rkp.Cor.Bif). On the mid shore there were approximately 20-30 larger, deeper pools that were completely dominated by a canopy of the invasive wireweed *Sargassum muticum* (see **Section 0** and **Figure 16**). Four of the largest pools are denoted by waypoints in **Figure 2**. These were assigned to the habitat '*Sargassum muticum* in eulittoral rockpools' (MA12631; LR.FLR.Rkp.Fk.Sar).

Figure 11. Shallow coralline rock pool with *Chondrus crispus*, *Corallina officinalis Hildenbrandia rubra* and *Littorina littorea* (MA1262; LR.FLR.Rkp.Cor)

Figure 12. Coralline rock pool with *Bifurcaria bifurcata* and *C. officinalis*. (MA12623; LR.FLR.Rkp.Cor.Bif)

1.3.9 From the mid to lower shore on the bedrock platform *F. vesiculosus* transitioned to the serrated wrack *F. serratus*, which formed the dominant canopy down to the sublittoral fringe (**Figure 13**). Beneath and amongst the canopy there were red algae including *C. officinalis*, *Osmundea pinnatifida*, *Chondrus crispus*, *Mastocarpus stellatus*, *Lomentaria articulata* and the green alga *Cladophora rupestris*. These species were more abundant towards the littoral fringe, where *U. lactuca* and *Palmaria palmata* were also growing epilithically and epiphytically on the *F. serratus* fronds. Fauna were recorded in the quadrats in the *F. serratus* habitat such as the dog whelk *Nucella lapillus*, the velvet swimming crab *Necora puber*, the chiton *Acanthochitona crinita* and the limpet *Patella aspersa*. This habitat was classified as '*Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock' (MA12441; LR.MLR.BF.Fser.R). From the mid shore down to the sublittoral fringe, partially overlapping the lower *F. vesiculosus* habitat and completely overlapping the *F. serratus* habitat (see **Figure 2**) there were extensive veneers formed by the tubes of the honeycomb worm *S. alveolata* (**Figure 13**, **Figure** 14 and **Figure** 15). Quadrats sampled in this habitat had the highest abundances of the gastropods *L. littorea* and *S. umbilicalis* and the barnacle *Perforatus perforatus* was observed on the lower shore within this habitat. This habitat covered more than half of the survey area and was assigned to '*Sabellaria alveolata* reefs on sand-abraded eulittoral rock' (MA2261; LS.LBR.Sab.Salv).

Figure 13. *Fucus serratus* with *Palmaria palmata* and *Ulva* spp. on lower shore bedrock (MA12441; LR.MLR.BF.Fser.R)

Figure 14. Extensive veneer of *Sabellaria alveolata* tubes amongst the algae on the lower shore. (MA2261; LS.LBR.Sab.Salv)

Figure 15. Close-up of *Sabellaria alveolata* veneer on the lower shore. (MA2261; LS.LBR.Sab.Salv)

Species and habitats of conservation importance

1.3.10 The dog whelk *N. lapillus* was observed on the lower shore in the *F. serratus* habitat (MA12441; LR.MLR.BF.Fser.R). This species is on the OSPAR list of threatened and/or declining species and habitats for regions II, III (the Proposed Development is in this region) and IV (OSPAR, 2009). However, the dog whelk is a common species in the British Isles and is not protected under any other piece of legislation.

1.3.11 More than half of the sandstone bedrock within the survey area included tubes of the honeycomb worm *S. alveolata*. These tubes can form topographically complex biogenic reefs, which are protected under Annex I of the European Habitats Directive (92/43/EEC). However, the tubes within the survey area comprised veneers on the rock of less than 2 cm in height rather than elevated reef structures and are therefore not considered to represent Annex I habitat.

Invasive Non-Native Species

1.3.12 Two Invasive Non-Native Species (INNS) were recorded during the survey. The brown alga *S. muticum* was abundant in some of the larger, deeper rock pools on the mid shore across the survey area (**Figure 16**; locations of some of these pools are indicated in **Figure 2**). This species is native to Japan and China and was first introduced to the UK on the Isle of Wight in 1971 (Farnham *et al*., 1973). It quickly expanded along the northern and southern coasts of the English Channel (Critchley *et al*., 1983) and has since extended its range westward and northward (Davison, 2009).

1.3.13 The barnacle *Austrominius modestus* was recorded with low abundances amongst *Chthamalus* spp. and *Semibalanus balanoides* on the mid to lower shore (**Figure 17**). This species is native to Australasia and was first recorded in the British Isles in 1946, by which time it was already well established in the southeast of England (Crisp, 1958) and has since spread to all coasts of England and Wales (Avant, 2007).

Figure 16. Abundant *Sargassum muticum* in mid shore rock pool north of the proposed landfall boundary

Figure 17. *Austrominius modestus* (circled) on lower shore amongst *Chthamalus montagui* and *Semibalanus balanoides*

Anthropogenic activity

1.3.14 The survey area is located just over a kilometre south of the popular holiday destination of Westward Ho! and the survey team observed members of the public using the beach for dog-walking and swimming.

1.3.15 Several pieces of steel debris that appeared to originate from a wrecked ship were noted on the upper shore (**Figure 18**). A large concrete mooring block with an attached chain was also noted on the upper shore near the middle of the survey area (**Figure 19**). The locations of these pieces of debris are noted with black crosses on the map in **Figure 2**. The strandline at the top of the shore also included various items of anthropogenic wood and plastic debris washed ashore by the tide.

Figure 18. Large piece of steel ship debris on mid shore

Figure 19. Concrete block and chain on the upper shore

1.4 Discussion

1.4.1 Beneath a ridge of barren upper shore cobbles and pebbles, most of the survey area was composed of sandstone bedrock covered by barnacles with zonation of the fucoids *F. spiralis*, *F. vesiculosus* and *F. serratus* from the upper to lower littoral. The fucoid canopy overlapped extensive but thin veneers of the honeycomb worm *S. alveolata* from the mid to low shore. A total of 13 habitats were recorded during the survey.

1.4.2 The dog whelk, *N. lapillus* is on the OSPAR list of threatened and/or declining species and habitats for OSPAR regions II, III and IV (the survey area is in region III). This species is listed primarily due to the threat caused by the contamination effects of tributyltin (TBT) used in antifouling paints (OSPAR, 2009), however, as TBT was banned in the UK in 1987 this is now a negligible threat to this species (Rodríguez *et al*., 2009). This species is common on rocky shores in the UK and was recorded on the lower shore bedrock.

1.4.3 Two invasive non-native species were recorded during the survey: the brown alga *S. muticum* was found in high abundance in some of the larger, deeper rock pools on the mid shore across the survey area and the Australasian barnacle *A. modestus* was observed in low abundance on the mid to lower shore bedrock surfaces. Both of these species have a widespread distribution throughout the coasts of the British Isles.

1.4.4 Most of the mid to lower shore bedrock within the survey area included tubes of the honeycomb worm *S. alveolata*. Where these tubes form reefs, they are protected under Annex I of the European Habitats Directive (92/43/EEC). However, to meet the criteria for biogenic reef, the tubes must be topographically distinct from the substrate, forming a structure with an elevation above 2 cm (NRW, 2019c). All the *S. alveolata* tubes within the survey area were in the form of veneers on the bedrock surface with canopies of fucoids over the top. Irrespective of area of coverage, such veneers do not qualify as reef habitat (NRW, 2019c).

1.4.5 Overall, habitats recorded were considered to be characteristic of moderately exposed rocky shorelines. The data obtained will be used to inform the benthic ecology Environmental Statement (ES) chapter and any accompanying ecological assessments.

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Annex 1: Quadrat abundance data

Quadrat abundance data is provided in the following data tables.

																								25 Jun'24	
Waypoint/Quadrat No	**10**	**11**	**12**	**14**	**16**	**17**	**21**		**18**		**19**		**20**	**37**	**39**		**51**	**52**	**53**	**56**		**57**
GPS Unit	**A**	**A**	**A**	**A**	**A**	**A**	**A**		**13**		**13**		**13**	**13**	**13**		**13**	**13**	**13**	**13**		**13**
							Canopy	Understorey	Canopy	Understorey	Canopy	Understorey			Canopy	Understorey				Canopy	Understorey	
	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.	% No.
Cobbles	100	100	100																			
Rock				58	74	12			4	25		20	50	50	8	30	6	12	24	6	4	
Sand				2	2					10		40			12	29						
Verrucaria maura																						
Ulva intestinalis				40	24	85										1						
Ulva lactuca																				<1		
Ulva linza																						
Ulva spp.																						
Steromphala umbilicalis				2	1							2	4				27		19	1		
Ascophyllum nodosum						2					100	40										
Fucus spiralis						1	100	8						<1	40	20			1			
Fucus vesiculosus									96	40					40	20		1				
Fucus serratus																				93	20	
Vertebrata lanosa											<1											
Corallinacea						<1				25											1	
Chthamalus spp.								92					50	50			2	1	8			96
Semibalanus balanoides																				<1	<1	
Anurida maritima								6														
Actinia equina												1										
Patella vulgata									6	6		1	2	2				5	1	2		18
Patella aspersa																						
Sabellaria alveolata																	88	80	63		72	
Fucus juvenile																	2					
Littorina littorea																	9	12	12			
Chaetomorpha linum																	<1		<1			
Osmundea pinnatifida																	1	4	1	1	1	
Littorina saxatilis																	2					
Carcinus maenas																	1					
Corallina officinalis																	1	2	2			
Chondrus crispus																			1			
Aglaothamnion spp.																			<1			
Mastocarpus stellatus																				2		
Cladophora rupestris																				<1		
Lomentaria articulata																				<1		
Spirobranchus spp.																				F		
Lichina pygmaea																					4	
Nucella lapillus																						
Ectocarpus spp.																						
Plocamium cartilagineum																						
Chondrocanthus acicularis																						
Acanthochitona crinita																						
Palmaria palmata																						
Alcyonidium gelatinosum																						
irridescent red																						
Necora puber																						
Gelidium sp.																						
Grateloupia filicina																						
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		100

	25 Jun'24																																	
Waypoint/Quadrat No	58		59			61			62	65			66	89	97	98	99	102	103	104	105			106			107			108			109		
GPS Unit	13		13			13			13	13			13	13	13	13	13	13	13	13	13			13			13			13			13		
	Canopy		Understorey			Canopy		Understorey		Canopy		Understorey									Canopy		Understorey	Canopy		Understorey	Canopy		Understorey	Canopy		Understorey	Canopy		Understorey
	%	No.	%	No.		%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Cobbles																																		
Rock				64			60		38		42		59	4	16	20	16	4	1	4	4													
Sand																																		
Verrucaria maura														64																				
Ulva intestinalis																																		
Ulva lactuca																					<1						<1		<1	2	8			
Ulva linza																				<1														
Ulva spp.																								<1		1								<1
Steromphala umbilicalis		6		12			7				3		10		15	12	22		11	6	1							1						3
Ascophyllum nodosum	84																																	
Fucus spiralis										96	4																							
Fucus vesiculosus			100	20		100	20			4			1		4	6																		
Fucus serratus		20																		8	88		76	48		20	92		44	88		23	98		32
Vertebrata lanosa	16																																	
Corallinacea							16										52			50								16						16
Chthamalus spp.				16			4		50		4		40	30	2	4	4	72	97															
Semibalanus balanoides																		8	1															
Anurida maritima																																		
Actinia equina																																		
Patella vulgata		5		7			6		8		8		1	8	2		3	18	17	14	2		1						1					5
Patella aspersa																					2		1	3		4								
Sabellaria alveolata		80													69	50				4	8		24	36		43	8		20			2		52
Fucus juvenile														2																				
Littorina littorea											1				4	13	12																	
Chaetomorpha linum																																		
Osmundea pinnatifida																			1	4	<1						<1		<1	<1				
Littorina saxatilis																																		
Carcinus maenas																																		
Corallina officinalis															8	16	28			4				<1		<1	<1		20	8		60			<1
Chondrus crispus															1					2														
Aglaothamnion spp.																			<1															
Mastocarpus stellatus																																		
Cladophora rupestris		<1																																<1
Lomentaria articulata																				16				<1		<1				<1				<1
Spirobranchus spp.																				F	O			F		F			O					O
Lichina pygmaea									12									16																
Nucella lapillus							1												6					1		1								
Ectocarpus spp.																4																		
Plocamium cartilagineum																				<1														
Chondrocanthus acicularis																				8														
Acanthochitona crinita																					1													
Palmaria palmata																								16		36				2		8		
Alcyonidium gelatinosum																													R					
irridescent red																													<1					
Necora puber																															1			
Gelidium sp.																															1			
Grateloupia filicina																																		<1
TOTAL	100	100	100	100		100	100		100	100	50		100	100	100	100	100	100	100	100	100		100	100		100	100		100	100		100	100		100