



Cambois Connection – Onshore Scheme

Environmental Statement Volume 3

Technical Appendix 9.1: Habitat Survey Report



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Basis of Report

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1.0 Introduction

1.1 Overview

Berwick Bank Wind Farm Limited (BBWFL) is a wholly owned subsidiary of SSE Renewables (SSER) (hereafter referred to as 'the Applicant'). The Applicant is proposing the development of Offshore Export Cables, Onshore Export Cables, an Onshore Converter Station and associated grid connection at Blyth substation in Northumberland, known as the 'Cambois Connection' ('the Project'). The onshore components of the Project, landward of Mean Low Water Springs (MLWS) comprise the Onshore Scheme ('the Site').

The purpose of this infrastructure is to facilitate the export of green energy from the generation assets associated with the Berwick Bank Wind Farm (BBWF), located in the outer Firth of Forth. A separate application for developing a grid connection to Branxton, East Lothian, has been included as part of the Applicant's application for consent for BBWF, currently being determined separately¹. The Project will enable the BBWF to reach full generating capacity (4.1 gigawatts (GW)) by the early 2030's.

The Project comprises two distinct proposals, or 'Schemes', which will require three separate consents. For the Onshore Scheme (all activities and infrastructure landward of MLWS) consent will be sought via a planning application to Northumberland County Council (NCC) as the local planning authority (LPA) under Section 57 of the Town and Country Planning Act 1990.

The offshore components of the Project seaward of Mean High Water Springs (MHWS) ('the Marine Scheme') are located within both Scottish and English waters. In Scotland, the Marine Scheme is entirely within offshore waters (i.e., between the 12 nautical miles (nm) limit and the Scottish Exclusive Economic Zone). In England, the Marine Scheme is within offshore waters and inshore waters.

SLR Consulting undertook a Preliminary Ecological Appraisal (PEA²) with respect to the Onshore Scheme. The PEA was based on a UK Habitat Classification (UKHab) survey and made recommendations for further surveys.

1.2 Site Description

The Site is located approximately 1 km north of Blyth and 0.7 km south of Ashington, in south-east Northumberland and is approximately 188 ha in area, centred on grid reference NZ 29311 84281 and is adjacent to the A189. The land to the east of the A189 is dominated by developed land of industrial nature with two active construction Sites at the time of survey. A section of the River Blyth and Sleek Burn can be found at the southern area of the Site boundary. To the east is the North Sea coast.

There are areas of vacant former industrial land currently located within the Site. The land to the east of the existing NSL Converter Station has planning permission for a battery manufacturing plant with ancillary offices, together with associated development and infrastructure works (hereafter referred to as 'the former Britishvolt site'). However, at the time of writing it is currently unknown whether an amended or reduced scheme will be proposed. The former site of the Blyth Power Station is situated to the south of the vacant Coal Stocking Yard Site, south of Brock Lane, which at the time of site survey (May 2023) was under construction for the development of an Advanced Manufacturing Technology Facility (AMTF).

¹ BBWF is subject to a separate consenting process. An application for consent under Section 36 of the Electricity Act 1989 (as amended) was submitted to MS-LOT and accepted in December 2022. The Branxton onshore infrastructure is subject to a separate planning application submitted to East Lothian Council and accepted in March 2023.

² SLR Consulting (2023) *Preliminary Ecological Appraisal – Cambois – Cable Landfall Project*.



1.3 Purpose of this Report

This report presents the findings of the habitat surveys. The report seeks to:

- Establish baseline conditions and identify important ecological features present (or those that could be present), as far as is possible at this time; and
- Identify important ecological features that could be impacted by the project, where possible; and

1.4 Evidence of Technical Competence and Experience

This report has been authored by Callum Taylor, a Senior Ecologist at SLR Consulting with over four years' experience as a professional ecologist. Callum has been involved in the collection of habitat data and is experienced in UKHab Habitat surveying.

Helen Allinson is a Senior Field Ecologist with over 8 years of experience in consultancy. Helen has undertaken training and has experience in UKHab surveying.

Niamh Ni Nagy is an Assistant Ecologist with 1.5 years' experience in consultancy. Niamh has undertaken training and has experience in UKHab surveying.

Sophie McPeake an Assistant Ecologist with 1 year of experience in consultancy. Sophie has undertaken training and has experience in UKHab surveying.



2.0 Methods

2.1 Study Area

The Site is located approximately 1 km north of Blyth and 0.7 km south of Ashington, in southeast Northumberland.

The study area for the habitat survey comprised all areas within the Site.

Locations have been described across the Site and with reference to the following three Zones (referred to in Appendix O3):

- 'Converter Station Zone';
- 'Landfall/High Voltage Direct Current (HVDC) Zone'; and
- 'High Voltage Alternative Current (HVAC) Zone'.

These Indicative Zones of Infrastructure are described in more detail in Volume 2, Chapter 5: Project Description.

2.2 UKHab Survey

The UKHab survey was conducted in two stages, the first for the purposes of a walkover survey to determine future survey requirements not limited to habitats. The results of this survey identified areas that were then subject to a detailed UKHab survey and Invasive Non Native Species (INNS) surveys.

2.2.1 Detailed Habitat Survey

The field survey comprised two main elements:

- Mapping of habitats - habitats mapped were confirmed using UKHab v1.1³ to capture the presence of Section 41 (of the Natural Environment and Rural Communities (NERC) Act 2006) and Annex 1 (of the EC Habitats Directive) habitat types; and
- Noting evidence of, or potential for, protected or notable species, or other important ecological features (such as veteran trees or invasive non-native species), such that specific follow up surveys can be scoped and undertaken thereafter.

Initial UKHab surveys were carried out by Callum Taylor between the 24th and 28th April 2023.

The UKHab survey was undertaken following methods as described in the UK Habitat Classification User Manual⁴. The survey identified habitats of conservation concern, protected or notable plant species and invasive/non-native species. Habitats were defined using primary codes to label the overall habitat and secondary codes to define details of the habitat. As required by the UKHab mapping system, the metadata table is shown in Table 2-1 below.

The estimation of abundance was based on the DAFOR scale, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors.

Detailed UKHab Surveys were conducted between Callum Taylor, Helen Allinson, Niamh Ni Nagy and Sophie McPeake. All detailed UKHab surveys were completed in appropriate weather conditions over the main growing season, between 13th August and 21st August.

³UK Habitat (UKHab) Classification (<https://ukhab.org/>)

⁴ Butcher B., Carey P., Edmonds R., Norton L and Treweek J. (2020) The UK Habitat Classification User Manual Version 1.1.



Table 2-1 UKHab Metadata for Cambois

Item	Data
Scope and purpose of survey	Baseline habitat survey to inform planning proposal
Area surveyed	Area surveyed shown on Figure 9.1.1 (Appendix 01).
UKHab edition used	Edition 1 (2020) and UK Habitat Classification - Professional Edition
Minimum level of mapping unit (MMU)	400 m ² , 20 m for linear features, smaller areas of interest have been target noted, locations shown in Drawing 2 (Appendix 01).
Level of UKHab hierarchy used	Up to Level 5 where possible.
List of secondary codes used	11 – Scattered trees 16 – Tall herb 19 – Ponds (priority habitat) 36 – Plantation 39 – Freshwater – man-made 49 – Veteran trees 75 – Active management 111 – Road 115 – Track 120 – Wet 161 – Tall or tussocky sward 191 – Ditch
Additional attributes recorded	None
Map projection and units	OSGB84
Year of survey	2023
Organisation and individual undertaking survey	SLR Consulting Ltd, Callum Taylor – Senior Ecologist, Helen Allinson, Niamh Ni Nagy and Sophie Allinson
References for existing data sets that have been used	None

2.3 Invasive Non-Native Species Survey

Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), including Japanese Knotweed (*Fallopia japonica*) and Himalyan Balsam (*Impatiens glandulifera*).

These surveys were targeted for areas which were assumed to have permanent impacts and where invasive species were already observed in the initial walkover surveys, however any evidence of INNS in other areas were also recorded during initial habitat surveys.

2.4 Ground Water Dependent Terrestrial Ecosystems

Groundwater Dependant Terrestrial Ecosystems (GWTDEs) are wetland habitats that derive their water supply primarily from groundwater as opposed to being rain or surface water fed, often supporting diverse, botanically rich ground-flora communities⁵. Habitat communities recorded during

⁵ Confederation of Forest Industries (2018). *Practice guide for forest managers to assess and protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation proposals*. Available at: <https://www.confor.org.uk/media/246950/practice-guide-on-ground-water-dependent-terrestrial-ecosystems.pdf> [Accessed August 2023].



the survey were assessed against Scotland and Northern Ireland Forum For Environmental Research (SNIFFER) and UK TAG guidelines⁶, for identifying potential GWDETs.

2.5 Limitations

The UKHab Minimum Mapping Unit (MMU) for the field survey 400 m², which may result in small areas of notable habitat (e.g., Priority Habitat) being excluded from UKHab output maps. In order to ensure all areas of notable habitat were effectively captured, priority habitats such as ponds and saltmarsh were retained as polygons. Remaining non-priority/notable habitats not meeting the MMU have been captured within descriptions and secondary codes.

The following areas could not be accessed:

- The Open Mosaic Habitats, grassland and scrub of NSL land in the south eastern area of the Site;
- The north eastern Open Mosaic Habitat (within fenced boundaries, north of the disused railway);
- The woodlands adjacent and to the west of the A189 Spine Road;
- Partial access was obtained of the mudflats; and
- Partial access of watercourses, woodland and scrub where vegetation is dense.

⁶ UK Technical Advisory Group on the Water Framework Directive, 2004. Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems, [available at <https://www.wfduk.org/resources%20/risk-assessmentgroundwater-dependent-terrestrial-ecosystems>, accessed 18/10/2023] UK Technical Advisory Group on the Water Framework Directive, 2004. Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems [Available at <https://www.wfduk.org/resources%20/risk-assessmentgroundwater-dependent-terrestrial-ecosystems> Accessed 18/10/2023]



3.0 Results

3.1 UKHab Survey

The results of the UKHab survey are summarised in Table 3-1 and illustrated in Figure 9.1.1 (Appendix 01).

Table 3-1: UKHab Categories Recorded on Site

UKHab	UKHab Name	Secondary Codes	Extent (% cover of Site)	Status*
g3c	Other Neutral Grassland	10 – Scattered scrub 11 – Scattered trees 14 - Scattered rushes 16 – Tall Herb 17 – Ruderal/ephemeral 78 – Abandoned 118- Mesic 160 – Sward type mosaic 161 – Tall or tussocky sward	25,16	None
g4	Modified Grassland	10 – Scattered scrub 11 – Scattered trees 60 -Sheep grazed 61- Horse grazed 76 – Recent management	3.28	None
s3a	Coastal sand dunes	10 – Scattered scrub 11 – Scattered trees	3.42	Priority Habitat
t2a	Coastal saltmarsh	n/a	0.22	Priority Habitat
t2d	Intertidal mudflats	n/a	2.04	Priority Habitat
t2h	Beach	n/a	2.92	Priority Habitat
h2a	Hedgerow (priority habitat)	36 – Plantation 78 – Abandoned 190 – Hedgerow with trees	2231 m	Priority Habitat
h3a	Blackthorn scrub	n/a	0.03	None
h3d	Bramble scrub	n/a	0.17	None
h3e	Gorse scrub	n/a	0.29	None
h3h	Mixed scrub	11 – Scattered trees	7.23	None
w1g6	Line of trees	36 – Plantation 49 – Veteran trees 78 – Abandoned	708 m	None
w1f7	Other Lowland Mixed Deciduous Woodland	36 – Plantation	11.43	Priority Habitat
w1h6	Other woodland; mixed; mainly conifer	36 – Plantation 49 – Veteran trees	1.23	None
w2b	Other Scot's Pine woodland	36 – Plantation	4.07	



UKHab	UKHab Name	Secondary Codes	Extent (% cover of Site)	Status*
r1	Standing open water and canals	19 – Ponds (priority habitat) 162- Temporary water bodies	4.05	Priority Habitat
r2	Rivers and streams	39- Freshwater - man-made 191- Ditch	0.2	Priority Habitat
f2f	Other swamps	119- Seasonally wet	0.07	None
u1a	Open Mosaic Habitats on Previously Developed Land	350 – Abandoned ruderal and derelict areas 351 – Vacant/derelict land	24.08	Priority Habitat
u1b5	Buildings	n/a	0.1	None
u1b	Developed land, sealed surface	n/a	6.09	None
u1e	Built Linear Features	94 – Green lane 111 – Road 115 – Track 189- Scattered grass	3.65	None
c1	Arable and horticulture	76- Recent management	0.12	None
Priority Habitat – Section 41 NERC ⁷ : a list of habitats and species, published in 2006 to identify, conserve and protect existing biological diversity, and to enhance it wherever possible. Priority habitats are shown in bold .				

A summary of each habitat recorded is provided below with details of representative species assemblages, a full list of species can be provided upon request.

3.1.1 Grassland

3.1.1.1 Other Neutral Grassland (UKHab g3c)

Other neutral grassland is common across the Site, most areas were historically arable fields and influenced by previous management practices representative of the industrial history of the area. The majority of these grasslands are in successional stages, regenerating grassland species after arable use, with varying dominance of common herbs and grasses across the swards, often forming dominant stands of a small number of species.

The grasslands are tall and tussocky with widespread cover of common neutral grassland species (Photo 1) such as *Dactylis glomerata*, *Holcus lanatus*, *Arrhenatherum elatius*, *Deschampsia cespitosa* and *Cirsium arvense*. Shorter species, often more herb rich, are common in areas regularly walked with species such as *Lotus corniculatus*, *Pilosella officinarum*, *Taraxacum sp.*, *Medicago lupulina*, *Ranunculus repens*.

⁷ Natural Environment and Rural Communities Act 2006 - Species of Principal Importance in England (section 41).



Photo 1: Example of most common grassland type



The most eastern fields (located in the Converter Station Zone) are more herb rich with varying dominant stands of species (Photo 2) such as *Ranunculus repens*, *Centaurea nigra* and *Vicia sp.* Scattered scrub, often young, is spread throughout the swards including *Crataegus monogyna*, *Sallix spp.*, *Prunus spinosa* and *Hippophae rhamnoides*.

Photo 2: Example of herb rich grassland type



In the south-east area of the Converter Station Zone are damper sections (Photo 3), tufts of *Deschampsia cespitosa*, *Ranunculus repens* and *Juncus effusus* are particularly dominant with frequent *Sallix sp.* scrub interspersed throughout the sward.



Photo 3: Example of damper grassland type



Grasslands immediately east of the dunes (located in the Landfall/Landfall/HVDC Zone) have a similar species assemblages but the sward is generally shorter (Photo 4) with more *Anthoxanthum odoratum*, *Holcus lanatus*, *Agrostis capillaris* and *Poa trivialis*. Short common herbs mentioned above are frequent and variable across the sward. Scattered young *Sallix spp.* scrub and trees are occasional. The sward is generally shorter than those previously described and more disturbed by walkers.

Photo 4: Example of grassland type adjacent to dune



3.1.1.2 Modified Grassland (UKHab g4)

Areas of modified grasslands are common in a linear arrangement alongside roadside edges and in small areas in the urban environment (Photo 5), some of which contain urban deciduous trees, *Fraxinus excelsior* and *Acer pseudoplatanus*. The grasslands are subject to regular mowing and have dominant species representative of nutrient enrichment such as *Lolium perenne*, *Trifolium pratense*, *Plantago major* and *Ranunculus repens*. Other low growing common herb and grass species are present within these swards including *Bellis perennis*, *Jacobaea vulgaris*, *Poa trivialis* and *Holcus lanatus*.



Photo 5: Example of roadside modified grassland



There are larger areas of modified grassland associated with a football field and park (Photo 6) to the south-east of the Site (located within the Landfall/Landfall/HVDC Zone) and around the school grounds to the east. Both of which are regularly managed by mowing and contain a similar species assemblage to the modified grassland present at the roadside as described above.

Photo 6: Example of modified amenity grassland



There are some smaller areas of modified grassland utilised for grazing by a small number of horses and sheep (Photo 7) to the south (located within the HVAC Zone) and east of Site (located within the Landfall/HVDC Zone). Species compositions in these areas are more varied but dominated by *Lolium perrene*, *Arrhenatherum elatius*, *Trifolium pratense*, *Plantago major*, *Plantago lanceolata*, *Cirsium arvense*, *Rumex obtusifolius* and *Ranunculus repens*.



Photo 7: Example of livestock grazed grassland



3.1.2 Sparsely Vegetated Land

3.1.2.1 Coastal Sand Dunes (UKHab s3a)

To the east of Site are the coastal sand dunes adjacent to the Northumbrian coast. Dune habitats are transitional by nature, constantly changing shape due to the influence of the sea. Additionally, these areas are subject to disturbance from dog walkers using the area. Stands of neutral grassland species on sandy ground dominate the northern area (Photo 8) such as *Dactylis glomerata*, *Arrhenatherum elatius*, *Hordeum murinum*, *Anthoxanthum odoratum*, *Galium verum*, *Ononis repens*, *Centaurea nigra*, *Deschampsia flexuosa*, *Holcus lanatus* and occasional *Leymus arenarius* and *Ammophila arenaria*. Regularly walked tracks have common low growing species *Pilosella officinarum*, *Taraxacum sp.*, *Euphrasia sp.*, *Achillea millefolium*, *Trifolium pratense* and *Poa trivialis*. Scattered young *Crataegus monogyna* scrub are occasional throughout in single specimens and dominant small stands.

Photo 8: Example of Dunes with neutral grasslands



Further south there is a gradual change and the dune species (Photo 9) *Leymus arenarius* and *Ammophila arenaria* become the most dominant species on sandy and stoney ground with few herb species present including *Linaria vulgaris*, *Medicago lupulina*, *Pilosella officinarum* and *Euphrasia spp.*



Photo 9: Example of southern dune area



3.1.3 Marine Inlets and Transitional Waters

3.1.3.1 Coastal Saltmarsh (UKHab t2a)

Along the banks of the River Blyth (located within the HVAC Zone) there are discrete locations of salt marsh habitat amongst mudflats (Photo 10). The upper region of the saltmarsh at the base of the banks is grass dominated, with species such as *Elymus pungens*, *Spartina sp.* and *Leymus arenarius*, with occasional *Tripolium pannonicum*. The lower region consists of more herb dominated areas of *Tripolium pannonicum*, *plantago maritima*, *Suaeda maritima*, *Salicornia europaea*, *Spergularia marina* and *Spergularia media*.

This habitat is a priority habitat.

Photo 10: Small stand of saltmarsh



3.1.3.2 Intertidal Mudflats (UKHab t2d)

At the base of the banks of the River Blyth (located within the HVAC Zone), the lower intertidal areas consist of mudflats (Photo 11) with plant species being limited to unknown algae species and scattered areas where remnants of the saltmarsh can be seen with scattered, rare, saltmarsh species such as *Plantago maritima*.



This habitat is a priority habitat.

Photo 11: Example of mudflats on the northern border of the River Blyth



3.1.3.3 Beach (UKHab t2h)

To the east of the Site the length of the intertidal coast consists of sandy beach with no vegetation and occasional areas of stoney ground (Photo 12).

Photo 12: Sandy Beach habitat



3.1.4 Heathland and Shrub

3.1.4.1 Hedgerow (UKHab h2a)

Hedgerows border many of the fields throughout the Site and are commonly dominated by *Crataegus monogyna*, *Prunus spinosa* and *Rubus fruticosus*. Single scattered hedgerows can be found throughout the Site alongside roads (Photo 13), within the former Britishvolt site (located within the Landfall/Landfall/HVDC Zone) and in the urban environment. No hedgerows showed signs of management and hedgerows associated with ditches were largely dry.



Photo 13: Example of roadside hedgerow



To the west (located within the Converter Station Zone) hedgerows are species poor, *Crataegus monogyna* dominated, with frequent *Prunus spinosa* and *Rubus fruticosus*, and rare *Ulex europaeu*, *Corylus avellana* and *Salix sp.* Mature trees are occasional to rare and consist of *Acer pseudoplatanus* and *Salix sp.* (Photo 14). The hedgerows are double planted and are unmanaged with average heights ranging from 3-4.5 m. The hedgerows have been planted amongst neutral grasslands and bounded by coniferous woodland and scrub.

Photo 14: Example of hedgerows bounding grasslands of historically arable use



To the south (located in the HVAC Zone) hedgerows are as described above with a similar species assemblage but with more mature trees that include *Fraxinus excelsior*, *Betula pendula*, *Acer pseudoplatanus* and *Salix sp.* (Photo 15). The hedgerows are mostly double planted. Those central to the southern Site are associated with ephemeral ditches, mostly dry.



Photo 15: Example of hedgerow with trees



A single hedgerow was noted to be newly planted in a single row adjacent to the road on this south-east corner of the former Britishvolt site (located at the Landfall/HVDC Zone).

3.1.4.2 Blackthorn Scrub (UKHab h3a)

There is a single stand and smaller patches, not meeting the MMU, of *Prunus spinosa* dominated scrub (Photo 16) within and bordering the deciduous woodland south of Brock Lane (located within the HVAC Zone). Frequent *Crataegus monogyna*, *Rubus fruticosus* and occasional *Rosa canina* were observed with tall herbs and grasses such as *Dactylis glomerata*, *Arrhenatherum elatius*, *Deschampsia cespitosa*, *Cirsium arvense*, *Jacobaea vulgaris* and *Chamaenerion angustifolium*.

Photo 16: Blackthorn scrub



3.1.4.3 Bramble Scrub (UKHab h3d)

Two single stands of *Rubus fruticosus* dominated scrub (Photo 17) were observed (located within the Landfall/HVDC Zone). The first on the former Britishvolt site between two watercourses leading from the watercourse Cow Gut. The Second between the broadleaved woodland surrounding the disused railway and along the roadside. Other shrub and tall ruderals are present with *Chamaenerion angustifolium*, *Dactylis glomerata*, *Arrhenatherum elatius*, *Deschampsia cespitosa*, *Cirsium arvense*, *Anthriscus sylvestris* and saplings of *Acer pseudoplatanu* and *Crataegus monogyna*.



Photo 17: Bramble Scrub



3.1.4.4 Gorse Scrub (UKHab h3e)

Two stands of *Ulex europaeu* were found at the north-eastern area (Photo 18) of the former Britishvolt site (located within the Landfall/HVDC Zone) surrounded by neutral grasslands. Both stands have frequent *Cytisus scoparius* and are intersected with a ground layer of tussocky grasses such as *Dactylis glomerata*, *Arrhenatherum elatius*, *Poa trivialis* *Holcus lanatus* and common herb species.

Photo 18: Gorse scrub



3.1.4.5 Mixed Scrub (UKHab h3h)

On the former Britishvolt site (located within the Landfall/HVDC Zone) mixed scrub can be seen in several small stands with a succession of dense shrubs and tall ruderals (Photo 19). The scrub is mainly dominated by *Rubus fruticosus* and shorter *Crataegus monogyna* and *Prunus spinosa* with frequent *Rosa canina* and tall herbs and grasses. Additionally, to the south scrub bounds the two retention ponds within the Site boundaries. This area could not be accessed for detailed survey but from a distance it was observed that more mature woody species are common with *Salix sp.*, *Betula pendula* and *Fraxinus excelsior* present. Between dense areas of woody species, tall herbs and grasses were observed, the species could not be identified from a distance.



Photo 19: Mixed scrub on former Britishvolt site



The disused railway (located within the Landfall/HVDC Zone) is bounded by scrub with stands of mature trees (Photo 20). The scrub contains many mature trees, but the canopy contains more woody species less than 5 m tall. The scrub is dominated by *Crataegus monogyna*, *Prunus spinosa* and with frequent *Rubus fruticosus*, sometimes in dominant stands, and other common scrub species. Tall herbs and grasses are common between scrub with a dominant small stands of *Chamaenerion angustifolium*, *Dactylis glomerata* and *Arrhenatherum elatius*.

Photo 20: Mixed scrub on disused rail area



The active rail to the east (located within the Landfall/HVDC Zone), adjacent to the dunes, contains dense *Rubus fruticosus* and *Crataegus monogyna* dominated scrub with occasional *Prunus spinosa* and tall herbs and grasses.

North of the Sleekburn and River Blyth (located within the HVAC Zone) is a linear area of mixed scrub with mature trees, mostly broadleaved, with tall tussocky grassland adjacent to the north and intertidal habitats to the south (Photo 21). The species dominance is varied across the length of the area between *Crataegus monogyna* and *Prunus spinosa*, with few small stands of dominant *Ulex europaeu* and mature *Acer pseudoplatanus*, *Hippophae rhamnoides*, *Betula pendula* and *Fraxinus excelsior*. The ground layer of the scrub consists of tall tussocky grassland species.



Photo 21: Example of linear scrub bounding northern Sleekburn and River Blyth banks



To the south of the Converter Station Zone, the linear mixed scrub forms a more dense patch bordering neutral grasslands (Photo 22). The species assemblage is similar to the aforementioned mixed scrub with more mature *Sallix* and *Prunus spinosa* trees.

Photo 22: Linear scrub to the south of the converter station area



3.1.5 Woodland and Forest

3.1.5.1 Line of Trees (UKHab w1g6)

There are eight lines of trees bordering neutral grassland (located within the Converter Station Zone and the HVAC Zone), historically arable, with common hedgerow species (Photo 23). These are likely to have been hedgerow historically, but the lack of management has allowed significant lengths of growth to above the 5 m height expected of hedgerow. The species present are commonly *Crataegus monogyna* and *Prunus spinosa* with occasional *Acer pseudoplatanus*, *Corylus avellana*, *Rubis fruticosus* and *Rosa canina*.



Photo 23: Example of most common lines of trees



A single line of trees can be found adjacent to the Cow Gut watercourse (located within the Landfall/HVDC Zone) approximately 80 m in length and double planted. The line of trees are 6.5 m tall and dominated by *Crataegus monogyna*. The line of trees is bounded to the east by scrub and pockets of mature trees and a public walking route to the west with ephemeral grasses and forbs.

3.1.5.2 Other Lowland Mixed Broadleaved Woodland (UKHab w1f7)

This is the most common woodland across the Site comprising of similar species assemblages but are variable in size and dominant species (Photo 24). All woodlands here are of plantation origin and most are regularly disturbed by the public, excluding those on the former Britishvolt site which have been impacted by construction activities.

Photo 24: Examples of plantation woodlands on former Britishvolt site



Additionally, a small stand of *Betula pendula* dominated woodland can be found in the south-east corner of the former Britishvolt site (located within the Landfall/HVDC Zone) and south of the North Sea Link Converter Station. Other species present are *Sorbus aria*, *Fraxinus excelsior*, *Salix spp.*, *Acer pseudoplatanus* and *Pinus sylvestris*. The woodland in the southeast area of the former Britishvolt site is intersected with bare earth and the northern section is more dense with more species present such as *Populus nigra* and *Alnus glutinosa*, with standing deadwood and fallen trees present also.



Small stands of this other lowland mixed broadleaved woodland can be found along the northern bank of the River Blyth (located at the HVAC Zone) amongst dense scrub with *Quercus robur*, *Prunus spinosa* and *Prunus domestica*. A small number of the trees within this woodland adjacent to the residential area contain mature trees with intrinsic value to protected species such as roosting bats and nesting birds.

There are two large stands of plantation woodland similar to that described above (Photo 25). The first can be found around the residential area to the west of the former Britishvolt site (located at the Landfall/HVDC Zone). The species assemblage is similar to the aforementioned woodlands with dominant *Fraxinus excelsior*, *Betula pendula* and frequent *Fagus sylvatica* and *Ulmus procera*. The woodland understory is largely lacking an abundance of ground flora but there are stands of *Rubus fruticosus*, *Urtica dioica* and common herbs.

Photo 25: Large stand of woodland bounding residential area



The second is to the south-eastern corner, south of Brock Lane (Photo 26). The canopy has more frequent *Pinus sylvestris* and is a lot more dense, with fallen trees and deadwood creating open areas with *Prunus spinosa* and *Rubus fruticosus* scrub. The understory is generally extremely dense with tall ruderal species and scrub.

Photo 26: Large stand of woodland in south-east corner of the Site.



Woodlands adjacent to the A189 could not be accessed to be surveyed but are considered to meet the same classification as those described here with species assemblages observed from a distance matching those described here.

3.1.5.3 Other Woodland; Mixed; Mainly Conifer (UKHab w1h6)

To the south and south-east of the disused rail area (located within the Landfall/HVDC Zone) there is a woodland which is comprised of both conifer and broadleaved trees (Photo 27) including *Betula pendula*, *Acer pseudoplatanus*, *Quercus robur*, *Fraxinus excelsior*, *Salix sp.* and *Alnus glutinosa*, with *Pinus sylvestris* most dominant. The ground flora consisted of small dominant stands of *Rubus fruticosus*, occasional young *Sallix sp.* and *Crataegus monogyna* with frequent *Dechampsia cespitosa*, *Anthriscus sylvestris*, *Primula veris* and *Urtica dioica*, as well as other common herbs and grasses. Fallen trees and deadwood are common across the woodland, likely caused in recent storms.

Photo 27: Stand of woodland to the south of the disused rail area



3.1.5.4 Other Scot's Pine Woodland (UKHab w2b)

Surrounding the grasslands of the Converter Station Zone is a large stand of *Pinus sylvestris* woodland (Photo 28) with occasional *Betula pendula*, *Alnus glutinosa*, *Crataegus monogyna* and *Prunus spinosa*. There are occasional dominant stands of *Rubus fruticosus*, common herbs and grasses but largely frequent bare earth. The woodland is plantation with occasional fallen trees and deadwood.



Photo 28: Stand of Scot's Pine woodland to the surrounding the Converter Station Zone



Two small areas of *Pinus sylvestris* dominated plantation woodlands (Photo 29) can be found along the Northumbrian coast (located within the Landfall/HVDC Zone) along dune walking routes and car parks. The woodlands mainly comprise of mature *Pinus sylvestris* trees with *Crataegus monogyna*, *Prunus spinosa* and *Rubus fruticosus* scrub. The ground flora of these woodland areas are all similar with lots of bare ground, dominant stands of *Urtica dioica* and frequent *Lolium perenne*, *Dactylis glomerata* and *Galium sp.*

Photo 29: Example of small woodland stands along the coast



3.1.6 Standing open water and canals (UKHab r1)

Ditches are common across the Site on many of the field boundaries to the east, centre and south of the survey area, these would have been drainage ditches used for arable purposes (Photo 30). The majority of these ditches were found to be ephemeral and by summer most had dried out. Most of these ditches contain some wet tolerant species, such as *Juncus sp.*, which suggests they are damp for some of the year but are heavily influenced by the species assemblage in adjacent neutral grasslands. No ditches had aquatic plant species in their channels. Many of these field boundary ditches are associated with linear hedgerows and lines of trees.



Photo 30: Example of most common field boundary ditch



Concrete based ditches are common on the former Britishvolt site (located within the Landfall/HVDC Zone) likely introduced on previous construction projects (Photo 31). The concrete ditches lack a base of soil and vegetation growth. However, some ditches have spilled soil heaps, damaged areas, rubble and rubbish filling the channel and creating pools with occasional vegetation.

Photo 31: Examples of concrete based ditch



Other ditches on the former Britishvolt site are similar to the aforementioned field boundary ditches (Photo 32) and in most cases are dry.



Photo 32: Example of drainage ditches on former Britishvolt site



There were several ponds found throughout the Site, but most were considered to be ephemeral, containing common *Typha spp.*, *Phragmites spp.*, and *Juncus spp.*, and were later found to be dry upon re-survey for the purposes of eDNA surveys⁸ (Photo 33).

Photo 33: Example of inundated area of temporary ponds



There are two ponds in the south-eastern area of the former Britishvolt site (located within the Landfall/HVDC Zone) which could not be fully surveyed due to access restrictions (Photo 34). The ponds were surrounded by scrub habitats and ephemeral grasses and herbs at the base of a concrete slope.

⁸ Cambois Connection Onshore Scheme, Volume 3. Technical Appendix 9.2 Great Crested Newt Report, 2023.



Photo 34: Example of the two ponds on the former Britishvolt site that could not be accessed



3.1.7 Rivers and Streams (UKHab r2)

To the south of the Site is the River Blyth (located within the HVAC Zone) which is an intertidal section of this watercourse. The banks of the river are variable with steep sections of scrub and gradual slopes with mudflats and saltmarsh habitats. The river channel is approximately 100 m wide, widening to the east as it reaches the coast.

In the northern area of the former Britishvolt site (located within the Landfall/HVDC Zone) is the Maw Burn watercourse (Photo 35). At the time of survey, it was mostly shallow with approximately 10 cm of water and frequently dry in areas to the east. The watercourse is situated within broadleaved woodland and between neutral grasslands. The banks are mostly steep with variable depths of up to 2 m, but within woodland areas occasionally the banks are extremely shallow.

Photo 35: North-east length of Maw Burn



To the southern area of the former Britishvolt site (located within the Landfall/HVDC Zone), between the construction area and disused rail, an additional watercourse named Cow Gut (Photo 36) can be found which is situated within woodland, scrub and neutral grasslands. The banks are quite shallow generally but do reach up to 1.5 m towards the south.



Photo 36: Eastern length of Cow Gut



3.1.8 Wetland

3.1.8.1 Other Swamps (f2f)

Along the northern eastern length of Maw Burn there is a small flooded area with *Typha latifolia*, *Chamaenerion angustifolium*, *Agrostis capillaris* and *Succisa pratensis*. Other shorter grasses and herbs could not be identified due to a lack of access (Photo 37).

Photo 37: Other Swamp on northern area of Maw Burn



3.1.9 Urban

3.1.9.1 Open Mosaic Habitats on Previously Developed Land (UKHab u1a)

There are three areas of Open Mosaic habitat across the Site. The Open Mosaic Habitat of the North Sea Link land (located at the HVAC Zone) has not been surveyed due to a lack of access. However, it should be noted that the area is a live construction site.

The disused railway location (located within the Landfall/HVDC Zone) is open mosaic on loose stoney surface and previously sealed surface. The communities present consist of annual communities, ruderal communities, open grassland and flower rich grassland (Photo 38).



Taller grasslands on Site have regular bare earth patches and frequent herbs such as *Daucus carota*, *Verbascum spp.*, *Arrhenatherum elatius*, *Dactylis glomerata*, *Deschampsia caespitosa*, *lanatus*, *Chamaenerion angustifolium*, *Epilobium hirsutum*, *Urtica dioica*, *Daucus carota*, *Linaria spp.*, *Artemisia spp.* and *Pulicaria dysenterica*.

Shorter grasslands are frequent in varying sizes across the Site and contain *Potentilla reptans*, *Ranunculus repens*, *Fragaria vesca*, *Pilosella officinarum*, *Deschampsia flexuosa*, *Potentilla erecta*, *erythraea*, *Lotus spp.*, *Medicago lupulina*, *Euphrasia spp.*, and young *Rubus fruticosus* saplings.

Invasive species across this area are common, see section 3.2 for further information on invasive species.

The area is bounded by scrub and woodland, alongside Cow Gut, intersecting the open mosaic habitats.

Photo 38: area of Open Mosaic Habitat at the disused railway area



The former Britishvolt site (located within the Landfall/HVDC Zone) is open mosaic on loose stoney surface, pulverised ash and previously sealed surface. The communities present consist of annual communities, ruderal communities, open grassland, herb rich grassland and inundation communities (Photo 39). The Site has been disturbed within the last year due to construction activities. Historically the Site had an abundance of invasive species which have since likely been managed, the future development of the Site is unknown.

Taller grasslands on Site have regular bare earth patches but with more frequent herbs such as *Echium vulgare*, *Reseda lutea* and *Daucus carota*.

Lower grasslands are slightly less frequent across the Site than the open mosaic habitat of the disused railway. The species assemblage is largely similar but areas are more disturbed with more bare ground patches.

There is a large area with an abundance of small pools that frequently flood with occasional herbs found in the wider mosaic habitats. Bare earth is frequent with approximately 70% cover and interspersed with small waterbodies.

Networks of ditches are present on Site, the banks of which are largely disturbed with scarce vegetation, with variable species assemblages inhabiting the banks and channels. See section 3.1.7 for a description of ditches present.

To the southern area of Site is a large area of pulverised ash based ground where there are regular pools and very scarce vegetation.



Photo 39: area of Open Mosaic Habitat on the former Britishvolt site



3.1.9.2 Buildings (UKHab u1b5)

On the former Britishvolt site (located within the Landfall/HVDC Zone) there is a single building which is mostly erected (Photo 40). The building is assumed to have been built for use during the construction phase, but this is unknown.

Photo 40: Single building on the former Britishvolt site



3.1.9.3 Developed land, sealed surface unvegetated, unsealed surface (UKHab u1b)

Across the Site are areas of car parks, residential areas and public pathways.

3.1.9.4 Built Linear Features (UKHab u1e)

The Site includes the slip roads leading from the A189 spine road and associated B roads to the south and east and railway adjacent to the Dunes.



To the south of the Site (located within the HVAC Zone) is a small road which has been abandoned resulting in the succession of short ephemeral herb species including an abundance of *Anthyllis vulneraria*, *Lotus corniculatus*, *Hippocrepis comosa* and other common herb and short grasses. Scattered young *Crataegus monogyna* and *Rubus fruticosus* are also present (Photo 41, Photo 42).

Photo 41: Area of ephemeral grasses and herbs on previously sealed surface



Photo 42: Area of ephemeral grasses and herbs, with patches of scrub, on previously sealed surface



Built linear features are considered to have a low biodiversity value. However, this area contains ephemeral herb species which are the larval food plants of BAP species butterflies, Dingy Skipper (*Erynnis tages*) and Grayling (*Hipparchia Semele*)⁹.

3.1.10 Arable and Horticulture (c1)

A single area of cropland is located north of Cow Gut and within the HVAC and Landfall/HVDC Zone. At the time of survey the field was recently ploughed and was surveyed from the fence line only (Photo 43).

⁹ Cambois Connection Onshore Scheme, Volume 3. Technical Appendix 9.3 Invertebrate Survey Report, 2023.



Arable habitats have low biodiversity value.

Photo 43: Cropland north of converter station



3.2 Invasive Non-native Species Survey

Locations of INNS have been shown in Figure 9.1.2 (Appendix 02), a summary of the findings has been given below.

3.2.1 Japanese Knotweed

Two stands of Japanese knotweed were found at the disused railway (located at the Landfall/HVDC Zone) on the base of the stoney mounds within scrub habitat at the north and south of the disused railway (Photo 44). The stand to the north was approximately 450 m² and the southern stand could not be recorded clearly due to dense vegetation but was estimated at 260 m².

Photo 44: Stand of Japanese Knotweed at disused rail area



3.2.2 Cotoneaster Species

Cotoneaster species (Photo 45) were identified as two single plants at the north and south section of the disused railway (located within the Landfall/HVDC Zone).



Photo 45: Stand of Cotoneaster at disused rail area



3.2.3 Japanese Rose

A single small stand of *Kerria japonica* (Photo 46) was found near the sealed surface of the disused railway (located within the Landfall/Landfall/HVDC Zone) near a stand of *Reynoutria japonica* and *Cotoneaster sp.*

Kerria japonica was also identified during the August 23rd 2023 butterfly survey within the coastal woodland parcel.

Photo 46: Stand of Japanese Rose at woodland along the east coast



3.2.4 Himalayan Balsam

Dense stands of *Impatiens glandulifer* (Photo 47) were found along the western length of Cow gut (located within the Converter Station Zone), within the woodland, and within the south-eastern woodland, south of Brock Lane (located within the HVAC Zone).



Photo 47: Stand of Himalayan Balsam in woodland along Cow Gut



3.2.5 Pirri Pirri Bur

Although *Acaena novae-zelandiae* is not a schedule 9 invasive species, it is recognised to be extremely invasive to the Northumberland coast, particularly in Dune habitats.

Dense stands can be found on the disused rail area (located within the Landfall/HVDC Zone), as well as small areas and single species occurrences (Photo 48).

Photo 48: Stand of Pirri Pirri Bur at the disused rail area



3.2.6 Buddleja

Buddleja is not a schedule 9 recognised species but is known to negatively impact ecosystems and therefore considered invasive.

Mature *buddleja* is prominent on the disused railway (located within the Landfall/HVDC Zone) on sealed surface, stoney areas and encroaching within the scrub and woodland of the area (Photo 49).



Photo 49: Stand Buddleja at disused rail area



3.3 Ground Water Dependent Terrestrial Ecosystems

No potential GWDTE habitats were identified on the Site.



4.0 Summary and Conclusions

4.1 Habitats

There are several Priority Habitats present on Site with a high biodiversity value, they are shown in Appendix O1 and have been listed below;

- All hedgerows (h2a) throughout the Site (Priority Habitat);
- All Open Mosaic Habitats (u1a) throughout the Site (priority habitat);
- The River Blyth (r2) running south of Site (Priority Habitat);
- The Maw Burn (r2) running from west to east through the centre of the Site (Priority Habitat);
- The Cow Gut (r2) running from north to south through the centre of the Site (Priority Habitat);
- The Coastal Sand Dunes (s3a) along the east coast (Priority Habitat);
- The Coastal Salt Marsh (t2a) along the River Blyth south of Site (Priority Habitat);
- The Intertidal Mudflats (t2d) along the River Blyth south of Site (Priority Habitat); and
- The Beach (t2h) along the eastern coast of Northumberland (Priority Habitat).

Tall herb neutral grassland and dense scrub habitats do not have priority status but have high biodiversity value and provide habitat for a diverse range of birds and invertebrates.

Loss of trees within any of the woodland areas will impact the woodland habitats. Mature trees are likely to provide suitable habitat for roosting bats, for example: where knotholes extend deep into the trunk or limbs have become sheared.

Short ephemeral grasses and herb habitats do not have priority status but offer important resource to the Priority Habitat species butterflies identified to be locally present.

All of the above habitats should be avoided as far as reasonably practical, if loss of these habitat due to the proposed development is unavoidable then on- or off-Site habitat creation or restoration is likely to be required in compensation.

4.2 INNS

The following Schedule 9 invasive species were recorded on Site:

- Japanese Knotweed in open mosaic habitat east of Site in the Landfall/HVDC Zone.
- *Cotoneaster* in in open mosaic habitat east of Site in the Landfall/HVDC Zone.
- Japanese Rose in open mosaic habitat and coastal woodland east of Site in the Landfall/HVDC Zone.
- Himalayan Balsam in coniferous woodland west of Site in the Converter Station Zone.

Additionally, the following species are considered invasive due to the detrimental impacts they are known to have on ecosystems:

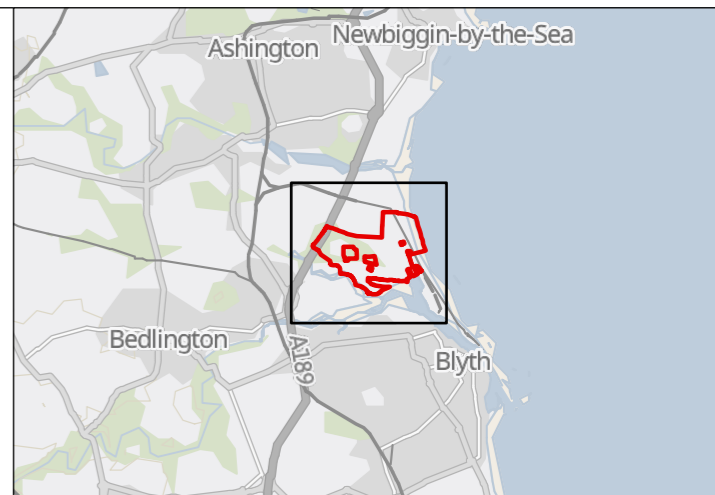
- Pirri Burr in open mosaic habitat east of Site in the Landfall/HVDC Zone.
- *Buddleja* in open mosaic habitat east of Site in the Landfall/HVDC Zone.

4.3 GWDTE

No potential GWDTE habitats were identified on the Site.



Appendix 01 Habitat Survey Map and Species List

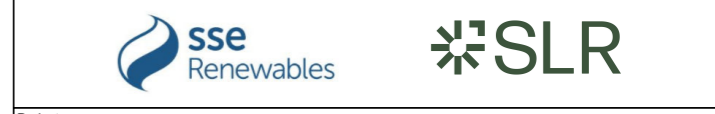


Legend

Site Boundary	r2 - Rivers and Lakes
UK Habitat Survey	s3a - Coastal Sand Dunes
h2a - Hedgerow (Priority Habitat)	t2a - Coastal Saltmarsh
r1 - Standing Open Water and Canals	t2d - Intertidal Mudflats
r2 - River and Stream	t2h - Beach
w1g6 - Line of Trees	u1a - Open Mosaic Habitats On Previously Developed Land
c1 - Arable and Horticulture	u1b - Developed Land, Sealed Surface
f2f - Other Swamps	u1b5 - Buildings
g3c - Other Neutral Grassland	u1c - Artificial Unvegetated Unsealed Surface
g4 - Modified Grassland	u1e - Built Linear Features
h3a - Blackthorne Scrub	w1f7 - Other Lowland Mixed Deciduous Woodland
h3d - Bramble Scrub	w1h6 - Other Woodland; mixed; Mainly Conifer
h3e - Gorse Scrub	w2b - Other Scots Pine Woodland
h3h - Mixed Scrub	
r1 - Standing Open Water and Canals	

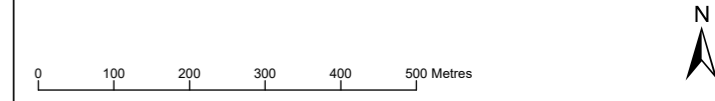
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Project
CAMBOIS CONNECTION ONSHORE SCHEME

Title
**FIGURE 9.1.1:
 BASELINE HABITAT SURVEY**



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Scale	Plot Size	Datum	Projection
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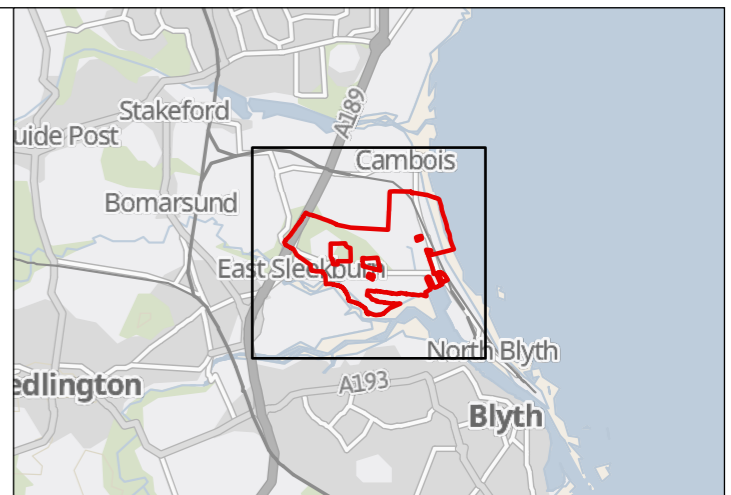
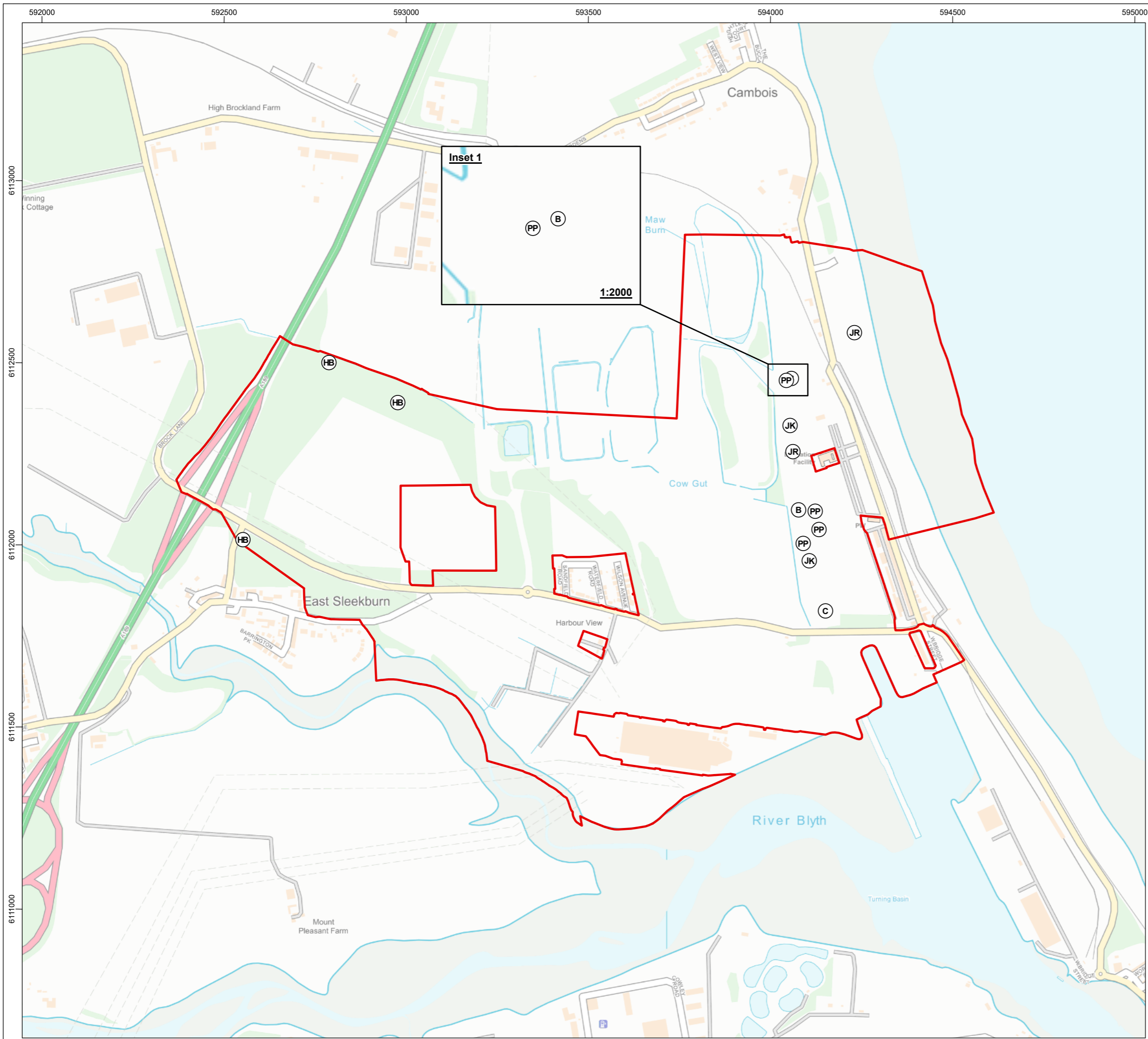
Table 3-1: Species List

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i>
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Black medic	<i>Medicago lupulina</i>
Black poplar	<i>Populus nigra</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus</i>
Broadleaved dock	<i>Rumex obtusifolius</i>
Broadleaved plantain	<i>plantago major</i>
Cleavers	<i>Galium sp.</i>
Cocks foot	<i>Dactylis glomerata</i>
Common centaury	<i>Centaurea nigra</i>
Common glasswort	<i>Salicornia europaea</i>
Common nettle	<i>Urtica dioica</i>
Common restharrow	<i>Ononis repens</i>
Cordgrass	<i>Spartina grass</i>
Cotoneaster species	<i>Cotoneaster spp.</i>
Cows lip	<i>Primula veris</i>
Cows parsley	<i>Anthriscus sylvestris</i>
Creeping buttercup	<i>Ranunculus repens</i>
Creeping thistle	<i>Cirsium arvense</i>
Elm	<i>Ulmus procera</i>
Eyebright species	<i>Euphrasia spp.</i>
False barley	<i>Hordeum murinum</i>
False oat grass	<i>Arrhenatherum elatius</i>
Greater sea-spurrey	<i>Spergularia media</i>
Himalayan balsam	<i>Impatiens glandulifer</i>
Japanese knotweed	<i>Reynoutria japonica</i>
Japanese rose	<i>Kerria japonica</i>
Ladys bedstraw	<i>Galium verum</i>
Lesser sea-spurrey	<i>Spergularia marina</i>
Lyme grass	<i>Leymus arenarius</i>
Marram grass	<i>Ammophila arenaria</i>
Mullien	<i>Verbascum spp.</i>
Pendunculate oak	<i>Quercus robur</i>
Perennial Rye grass	<i>Lolium perenne</i>
Pirri pirri bur	<i>Acaena novae-zelandiae</i>

Reed species	<i>Phragmites spp.</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Rough meadow-grass	<i>Poa trivialis</i>
Rush species	<i>Juncus spp.</i>
Scots pine	<i>Pinus sylvestris</i>
Sea aster	<i>Tripolium pannonicum</i>
Sea blite	<i>Suaeda maritima</i>
Sea couch grass	<i>Elymus pungens</i>
Sea plantain	<i>plantago maritima</i>
Silver birch	<i>Betula pendula</i>
Soft rush	<i>Juncus effusus</i>
Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Sycamore	<i>Acer pseudoplatanus</i>
Tufted hair grass	<i>Deschampsia cespitosa</i>
Viper's -bugloss	<i>Echium vulgare</i>
Wavy hair grass	<i>Deschampsia flexuosa</i>
White clover	<i>Trifolium pratense</i>
Whitebeam	<i>Sorbus aria</i>
Wild carrot	<i>Daucus carota</i>
Willow species	<i>Sallix Sp.</i>
Yellow mignonette	<i>Reseda lutea</i>
Yorkshire fog	<i>Holcus lanatus</i>



Appendix 02 Invasive Non-native
Species Map



- Legend**
- Site Boundary
- Invasive Non-Native Species**
- B Budleja
 - C Cotoneaster
 - HE Himalayas Balsam
 - JK Japanese Knotweed
 - JR Japanese Rose
 - PP Pirri Pirri Burr

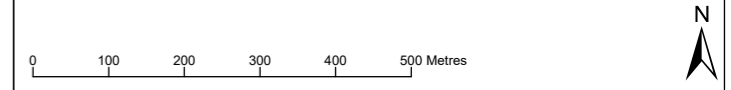
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Project
CAMBOIS CONNECTION ONSHORE SCHEME

Title
FIGURE 9.1.2: INVASIVE NON-NATIVE SPECIES

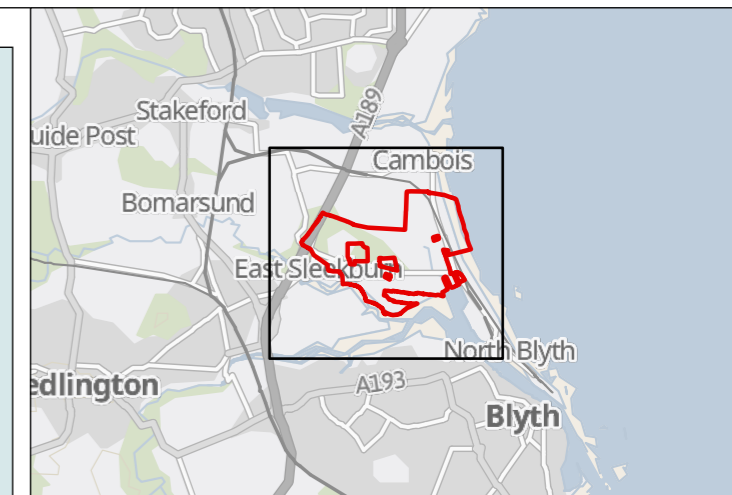
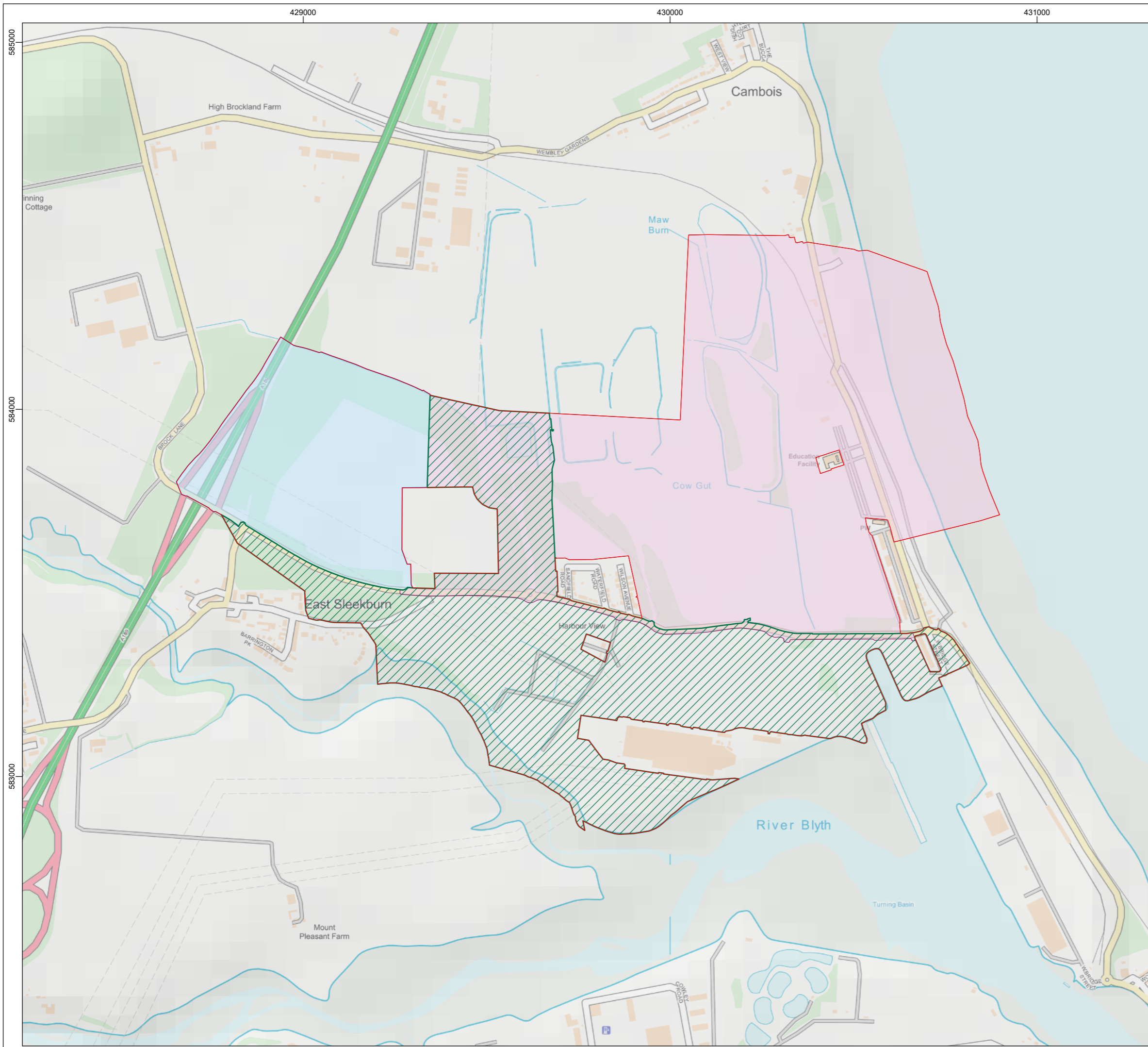


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Scale	Plot Size	Datum	Projection
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Appendix 03 Indicative Onshore Zones of Infrastructure



- Legend**
- Site Boundary
 - Landfall and High-Voltage Direct Current (HVDC) Zone
 - High-Voltage Alternating Current (HVAC) Zone
 - Converter Station Zone

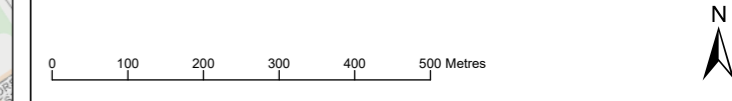
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Project
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INDICATIVE ZONES OF INFRASTRUCTURE



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