MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report

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Glossary

Term	Meaning
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Baseline	The status of the environment without the Transmission Assets in place.
Biodiversity benefit	An approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected.
Domin scale	A measure of percentage cover per plant species within a survey quadrat.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the Environmental Impact Assessment and Habitats Regulations Assessment processes for certain topics.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Expert Working Group	A forum for targeted engagement with regulators and interested stakeholders through the Evidence Plan Process.
Export cable corridor	The specific corridor of seabed (seaward of Mean High Water Springs) and land (landward of Mean High Water Springs) from the Generation Assets to the National Grid Penwortham substation.
Ground flora	Usually the lowest level of vegetation recorded in layered vegetation, typically woodland.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Morecambe OWL	Morecambe Offshore Windfarm Limited is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.

Term	Meaning
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Onshore Infrastructure Area	The area within the Transmission Assets Order Limits landward of Mean High Water Springs. Comprising the offshore export cables from Mean High Water Springs to the transition joint bays, onshore export cables, onshore substations and 400 kV grid connection cables, and associated temporary and permanent infrastructure including temporary and permanent compound areas and accesses. Those parts of the Transmission Assets Order Limits proposed only for ecological mitigation/biodiversity benefit are excluded from this area.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Order limits	The limits within which the Transmission Assets may be carried out.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
Protected species	A species of animal or plant which it is forbidden by law to harm or destroy.
Quadrat	Typically square areas of a defined size within which vegetation in a plant community is recorded.
Understorey	The typically shrubby component of woodland vegetation, between the canopy and ground flora layers.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Survey area	The area within which each survey has been undertaken. This may differ from the Study Area as a Survey Area will be based on species or survey-specific guidance on the extent of survey required, which may be limited by, for example, habitat conditions, or be defined in terms of buffer areas around an area of potential impact.
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).

Term	Meaning
Transmission Assets Order Limits	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning.
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.

Acronyms

Acronym	Meaning
BSBI	Botanical Society of Britain and Ireland
ES	Environmental Statement
EWG	Expert Working Group
FISC	Field Identification Skills Certificate
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
MAVIS	Modular Analysis of Vegetation Information System
NVC	National Vegetation Classification
PEIR	Preliminary Environmental Information Report
SSSI	Site of Special Scientific Interest
TN	Target Note
UK	United Kingdom

Units

Unit	Description
%	Percentage
cm	Centimetres
ha	Hectares
km	Kilometres
kV	Kilovolt
M	Metres

1 Phase 1 habitat survey, national vegetation classification and hedgerow survey technical report

1.1 Introduction

1.1.1 Overview

1.1.1.1 This document forms Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report of the Environmental Statement (ES) prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (hereafter referred to as the Transmission Assets). The ES presents the findings of the Environmental Impact Assessment (EIA) process for the Transmission Assets.

1.1.1.2 Phase 1 habitat survey is a field survey technique used to rapidly classify and map semi-natural vegetation and other wildlife habitats located within or near a proposed development site.

1.1.1.3 Hedgerow surveys are used to classify hedgerows as to whether they are 'important' or 'not important' as defined in the Hedgerow Regulations 1997 ('the Hedgerow Regulations). 'Important' hedgerows are considered to be of greater ecological importance than 'not important' hedgerows.

1.1.1.4 National Vegetation Classification (NVC) surveys enables comparison of data on plant communities with reference samples as described in British Plant Communities volumes 1-5 (Rodwell, 1991a; 1991b; 1992; 1995; 2000), which allows data on vegetation to be described and evaluated in a standardised way.

1.1.1.5 This document presents and characterises the results of phase 1 habitat, hedgerow and NVC surveys undertaken as part of the ES for the Transmission Assets. These results provide a basis for describing the extent, distribution, and ecological importance of habitats, hedgerows and vegetation communities within and in proximity to the Transmission Assets. Figures and summary tables and are provided for phase 1 habitats, along with separate figures and tables showing hedgerows and watercourses.

1.1.1.6 This document has been updated to respond to Natural England Relevant Representation (RR-1601 1601.G.19) which requested a figure showing the locations of each of the NVC survey sites based on the X, Y coordinates. The Applicants confirm that the findings of the survey presented in this annex remain unchanged.

1.1.2 Study area

1.1.2.1 The study area is intended to cover the area within which an impact can be reasonably expected to occur and describes the geographical extent subject to desk-based research.

1.1.2.2 The study area is the area subject to desk based research for habitats and comprises the Onshore Order Limits and a 2 kilometre (km) buffer (hereafter

referred to as the 'study area'). The buffer is considered the industry standard and appropriate zone of influence for the Transmission Assets.

1.1.2.3 The location and geographic extent of the study area is presented in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

1.1.3 Survey area

1.1.3.1 The survey area is defined as the area within which each survey has been undertaken and is based on species or site-specific guidance on the extent of survey required. The survey area for phase 1 habitat, NVC and hedgerow surveys (hereafter referred to as the 'survey area') is defined as a 150 metre (m) buffer around the Onshore Order Limits, as shown in **Figure 1.1**.

1.1.3.2 The buffer of 150 m was chosen to provide an appropriate level of contextual habitat data adjacent to the Onshore Order Limits, in order to ensure that the ES is accurately informed with data from within the Transmission Assets Order Limits (i.e. that may be subject to direct impacts) and data from outside the Transmission Assets Order Limits (i.e. that may be subject to indirect impacts).

1.1.3.3 For the purposes of this technical report and for ease of reference, the survey area has been separated into sections. The location and extent of the sections are shown in **Figure 1.1** and comprise: section 1, section 2, section 3, section 4, section 5, section 6, section 7a and section 7b.

1.1.3.4 These sections were informed through discussions with the Applicants and allowed the location of ecological features to be more accurately described in relation to the Onshore Order Limits, to facilitate the description of the baseline conditions and assessment.

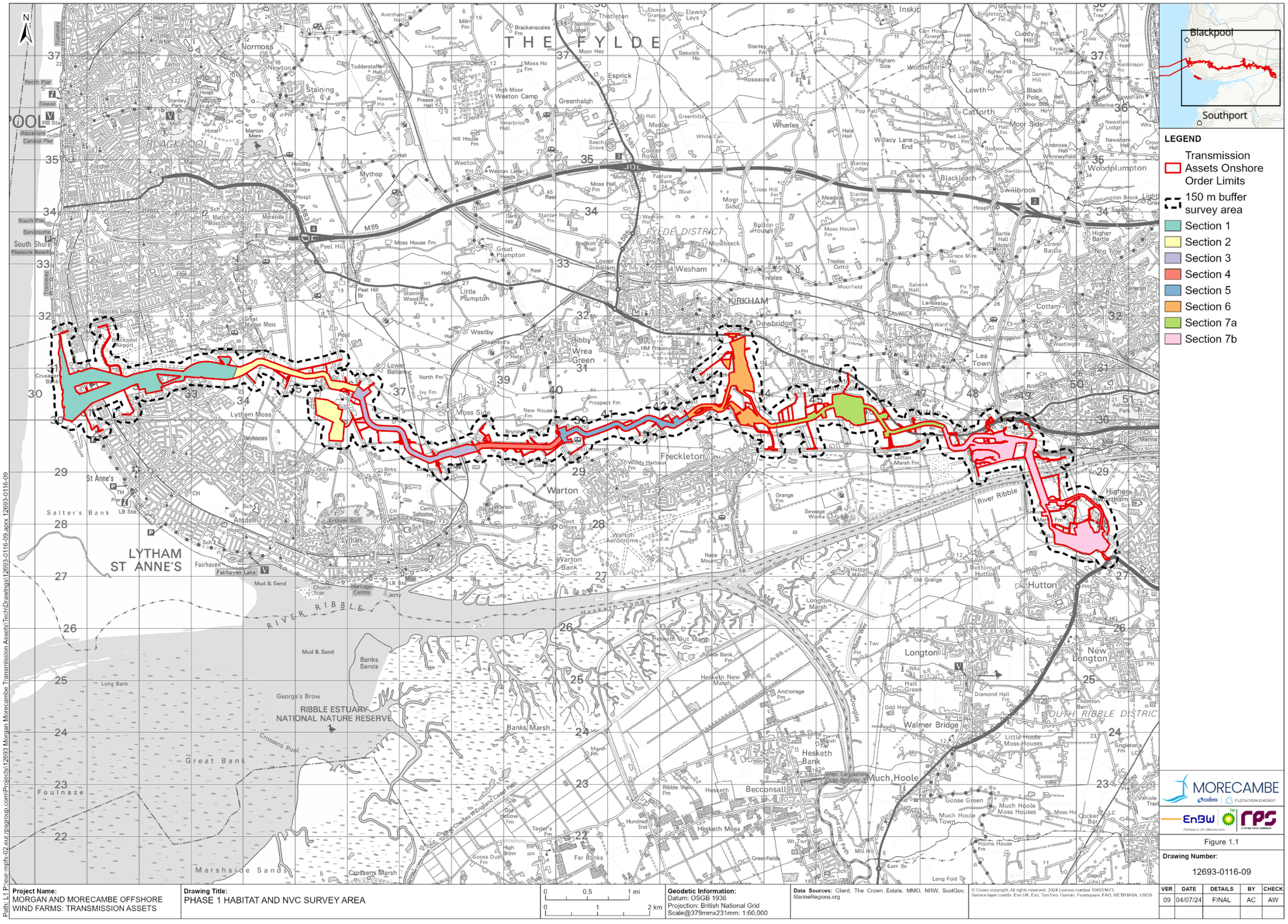

Figure 1.1: Survey area

1.1.4 Relevant legislation

1.1.4.1 With few exceptions, habitats and vegetation communities are not legally protected in the UK other than through designation as statutory sites of nature conservation importance, as supporting habitat for protected species and through duties placed on public bodies. Legislation which is relevant in this context includes:

- the Conservation of Habitats and Species Regulations 2017, (as amended) including through selecting, managing and restoring sites that contain examples of Annex I habitats of the Habitats Directive to a favourable conservation status;
- the Wildlife and Countryside Act 1981 (as amended), including through notification and protection of Sites of Special Scientific Interest (SSSIs) under Part II of the Act;
- the Natural Environment and Rural Communities (NERC) Act 2006 that includes a legal duty under Section 41 of the Act to provide a list of habitats and species of principal importance to enable public bodies to comply with the biodiversity duty;
- the Environment Act 2021 through the strengthened biodiversity duty that includes a requirement for public authorities to prepare nature recovery and protected site strategies; and
- the Hedgerow Regulations 1997, which includes provisions for protection of 'important' hedgerows (hedgerows that have existed for 30 years or more and satisfy at least one of the criteria listed in Part II of Schedule 1 of the Regulations).

1.1.4.2 Further details on this legislation can be found in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.

1.1.5 Consultation

1.1.5.1 In October 2022, the Applicants submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects for the construction, operation and maintenance and decommissioning phases of the Transmission Assets.

1.1.5.2 The scope, methodology and findings of the phase 1, hedgerow and NVC surveys, including those undertaken beyond the current Onshore Order Limits, were discussed, and agreed with stakeholders via regular onshore ecology Expert Working Group (EWG) meetings. Further detail regarding consultation undertaken with respect to onshore ecology, including terrestrial invertebrate surveys can be found in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.

1.2 Methodology

1.2.1 Overview

1.2.1.1 A combination of desk studies and field surveys were undertaken to ascertain the presence (or likely habitats present) within the study and survey areas. The results of the desk study are presented in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES and summarised below.

1.2.1.2 Desk study

1.2.1.3 Information on protected and notable habitats within the survey area was collected from existing studies and datasets. These are summarised in **Table 1.1**.

1.2.1.4 In addition, for any areas where access could not be obtained, aerial photographs (viewed via Google maps and Google Earth Pro) were used to map habitats present. As noted in **paragraph 1.2.2.3**, 91.5% of the of the habitats within the Onshore Order Limits was subject to site-based Phase 1 surveys and 8.5% of the habitats required mapping via aerial photography.

Table 1.1: Summary of key desktop sources for Transmission Assets relevant to phase 1 habitat, hedgerow and NVC

Title	Source	Year	Author
Multi-Agency Geographic Information for the Countryside (MAGIC)	Department for the Environment, Food & Rural Affairs (Defra)	2024	Defra
UK Protected Area Joint Nature Conservation Committee (JNCC)	JNCC website	2024	JNCC
A vegetation survey of the Fylde Sand Dunes and Saltmarshes 2016	Fylde Sand Dune Project	2016	Graeme Skelcher

1.2.2 Site-specific surveys

Phase 1 habitat survey

Overview

1.2.2.1 The phase 1 habitat surveys were undertaken between May 2022 and July 2024 to map habitat types present and identify potential for protected or notable species within the phase 1 habitat survey area. The surveys were undertaken by ecologists suitably experienced in undertaking phase 1 habitat surveys in accordance with the standard methodology set out in the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey - a technique for environmental audit (JNCC, 2010).

1.2.2.2 All habitat types recorded within the phase 1 habitat survey area were mapped using the JNCC Phase 1 Habitat Classification scheme, including phase 1 habitat types. In addition to habitat types, the phase 1 habitat surveys also identified habitats of potential value to legally protected or otherwise notable species. The results of the phase 1 habitat surveys provided in this report have not been used to determine the presence or likely absence of a protected or otherwise notable species within the phase 1 habitat survey area.

Limitations

1.2.2.3 Phase 1 habitat surveys were completed for 91.5% of the Onshore Order Limits and 81.4% of the total survey area, as shown in **Figure 1.2**. This was due to access limitations such as access refusals or on-site access restrictions. Areas subject to aerial survey were predominantly built-up areas with little ecological value. The remaining 8.5% of the Onshore Order Limits and 18.6% of the survey area were assessed indirectly based on surveys from adjacent parcels, using aerial photography and desk-based analysis of the inaccessible areas.

1.2.2.4 As it is only a small proportion of the Onshore Order Limits for which phase 1 habitat surveys have not been completed, the use of aerial photography to fill in these gaps does not affect the validity of the baseline assessment. This is especially true considering that much of the unvisited habitats are either built-up areas (e.g., residential development, garden or hardstanding) or comprises agricultural land and associated habitats. Overall, the coverage and approach is considered appropriate and robust for the purposes of informing the baseline conditions reported in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.

1.2.2.5 Some of the phase 1 habitat surveys were initially undertaken during sub-optimal conditions. For example, during the winter months (i.e., December to February). Where this was the case and where access was possible, these parcels were revisited in optimal conditions, to provide further survey results and affirm/update the phase 1 survey data.

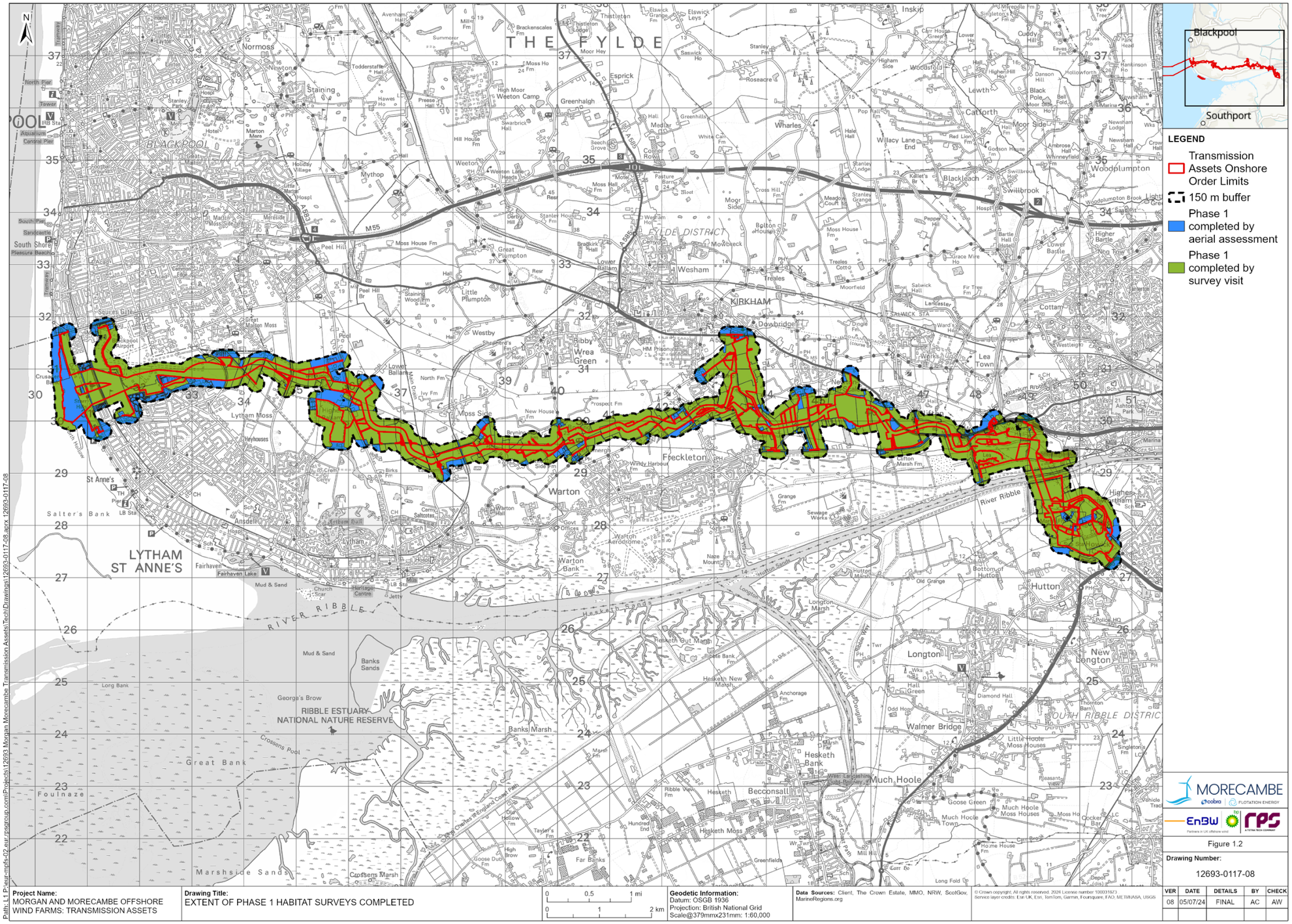

Figure 1.2: Phase 1 habitat survey coverage

Hedgerow surveys

Overview

1.2.2.6 Results of phase 1 habitat surveys were used to confirm where hedgerows were located and how many woody species each hedgerow comprised. Woody species are perennial plants with stem(s) and branches from which buds and shoots develop. Hedgerows with four or more woody species were subject to an assessment in accordance with the Hedgerow Regulations ('Hedgerow Regulations survey').

1.2.2.7 All hedgerows within the onshore substation areas were subject to a hedgerow condition assessment ('condition survey') in accordance with Natural England's Biodiversity Metric (4.0) (Natural England, 2023).

1.2.2.8 All surveyors were suitably trained and experienced with the appropriate level of botanical knowledge for undertaking the survey methodologies above.

Hedgerow Regulations survey

1.2.2.9 All hedgerows in the survey area with more than four woody species were scoped in for Hedgerow Regulations surveys. The Hedgerow Regulations surveys followed the methods defined in the Defra Hedgerow Survey Handbook (Defra, 2007). Hedgerow Regulations surveys were undertaken from April to June 2024.

1.2.2.10 In accordance with the requirements of the Hedgerow Regulations, each hedgerow scoped in for a Hedgerow Regulations survey was assessed to determine if it was classed as 'important' or 'not important' in relation to ecological importance. Hedgerows can also be assessed for their importance in relation to cultural heritage. This is detailed separately in Volume 3, Chapter 5: Historic environment of the ES.

1.2.2.11 The survey involved recording the ecological information along at least one 30 m section of each hedgerow. For hedgerows 30 m or less in length the whole hedgerow was surveyed. For hedgerows between 30 m and 100 m in length the central 30 m was surveyed. For hedgerows between 100 m to 200 m the hedgerow was divided in two and each central 30 m section surveyed. For hedgerows over 200 m in length the hedgerow was divided into three sections and the central 30 m of each section surveyed.

1.2.2.12 The information recorded for each survey, including a brief description of the information is presented in **Table 1.2** below.

Table 1.2: Hedgerow attributes recorded to assess importance

Information recorded	Description
Hedgerow type	The type of hedgerow that could include shrubby hedgerow, shrubby hedgerow with trees, line of trees.
Length	Length of the hedgerow in metres.
Connection with other hedgerows	The number of connections with other hedgerows to determine whether the hedgerow forms part of a hedgerow network.

Information recorded	Description
Extent and location of survey	Details of the wider area that included either the whole hedgerow or the 30 m section(s).
Adjacent land use	Description of the adjacent land use e.g. arable, pasture, woodland, water, etc.
Associated features	Description of associated features including a bank or wall; if the bank or wall was at least half the length of the hedgerow; a ditch; if the ditch was at least half the length of the hedgerow; any gaps of no more than 10% of the length of the hedgerow; any standard tree per 50 m of the length of the hedgerow; whether at least three ground flora woodland species (as defined in Schedule 2 of the Hedgerow Regulations) were located within 1 m of the hedgerow; any connections scoring four or more points, where connection with a hedgerow counts as one, and a connection with broadleaved woodland or a pond counts as two; and any parallel hedge located within 15 m of the hedgerow.
Undisturbed ground and perennial herbaceous vegetation cover	Average width of undisturbed ground. Average width of perennial herbaceous vegetation.
Nutrient enrichment ground flora indicator species	Percentage of hedgerow per 30 m samples recorded with more than 20 % cover of nettle *Urtica sp.*, cleaver *Galium aparine*, or dock *Rumex sp.*
Recently introduced, non-native species	Percentage of hedgerow per 30 m samples with no more than 10% cover of recently introduced, non-native species.
Hedgerow shape	Percentage of total number of hedgerows surveyed in each shape category including trimmed and dense, intensively managed, untrimmed, tall and leggy, untrimmed with outgrowths, recently coppiced, or recently laid.
Dimensions	Average height and width of hedgerow, excluding any bank beneath the hedgerow, gaps, and any hedgerow trees and their height, and estimated at the widest point for the width.
Integrity (i.e. ‘gappiness’)	Percentage of hedgerow with gaps less than 10 % of the hedgerow length, no gap greater than 5 m, and base of leafy growth less than 0.5 m from the ground for a shrubby hedgerow.
Isolated hedgerow trees	Percentage of young trees with a diameter at breast height of 1-5 cm within the total number of trees in the sample, percentage of veteran trees with a diameter at breast height of 1 m or more within total number of trees in the sample, average number of isolated hedgerow trees per 100 m of hedgerow, total number of isolated hedgerow trees along the section of hedgerow being surveyed.
Woody species per 30 m	Number of woody species per 30 m length including structural species, not climbers (other than rose *Rosa sp.*) or bramble.
Details of hedgerow management; ground flora species per 30 m; and veteran tree features	Details of both recent and older hedgerow management. Records of ground flora species and cover. Presence of veteran tree features including dead wood attached to the tree, loose, split, missing and dead bark, bark sap runs, tears, splits, scars, lightning strikes, hollow trunks or hollows in major limbs, or major rot sites.

1.2.2.13 Hedgerows were considered ecologically ‘important’, in accordance with the Hedgerow Regulations if they were at least 30 years old and met one of the following criteria.

- Contained protected species listed in part 1 of Schedule 1, Schedule 5 or Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- Contained species that are endangered, vulnerable, and rare and identified in the British Red Data books (Perring and Farrell, 1983; Shirt, 1987; Bratton, 1991; Stewart and Church, 1992).
- Included woody species, and associated features as specified in Schedule 1, Part II Criteria, paragraph 7(1) of The Hedgerows Regulations 1997. In summary, and specifically for north west England, the hedgerow must include one or more of the following:
  - at least six woody species;
  - at least five woody species plus at least three associated features (detailed below);
  - at least five woody species including black poplar, large-leaved lime, small-leaved lime or wild service tree; or
  - at least four woody species and at least four associated features.

1.2.2.14 The aforementioned associated features include:

- a bank or wall for at least half the length;
- a ditch for at least half the length;
- gaps over no more than 10 % of the length;
- at least one standard tree per 50 m;
- at least three ground flora woodland species as defined in Schedule 2 of the Regulations within 1 m of the hedgerow;
- connections scoring four or more points, where connection with a hedgerow counts as one, and a connection with broadleaved woodland or a pond counts as two; or
- a parallel hedge within 15 m.

1.2.2.15 Neither connections or parallel hedges are counted as associated features if public rights of way are included within the criterion.

Condition Assessment

1.2.2.16 The condition of hedgerows was assessed in accordance with the Habitat Condition Assessment sheet for Natural England's Biodiversity Metric (4.0) (Natural England, 2023).

Limitations

1.2.2.17 Optimal time for Hedgerow Regulations surveys is between April and September. Surveys in 2024 were commenced in April and finished in June 2024, therefore within this optimal period. No limitations to the hedgerow surveys were identified.

NVC survey

Overview

1.2.2.18 The NVC survey is a detailed botanical survey technique designed to identify plant communities. The preceding phase 1 habitat surveys are designed to identify habitats only. Habitats that could support notable plant communities, or diverse assemblages of plant species, including rare or scarce species associated with Sites of Special Scientific Interest (SSSI) were scoped in for NVC survey.

1.2.2.19 The woodland NVC surveys were undertaken in July 2023, with reference to the guidelines set out in National Vegetation Classification: Users' handbook (Rodwell, 2006). All surveys were undertaken by competent botanical surveyors with a level four Field Identification Skills Certificate (FISC) from the Botanical Society of Britain and Ireland (BSBI) at a minimum.

1.2.2.20 NVC surveys of the sand dunes at landfall were undertaken in 2016 for the Fylde Sand Dunes Project (Skelcher, 2016) and results from those surveys are referred to below. Refer to Skelcher (2016) for methods employed during those surveys.

1.2.2.21 Ground truthing NVC surveys of the sand dunes at landfall were undertaken in August 2024. These surveys sought to reconcile the data from the Skelcher (2016) report with direct observation in the field, with a focus on the hydrologically sensitive dune slack communities present. The survey followed the guidelines set out in Rodwell (2006), as above. As above, all surveys were undertaken by competent botanical surveyors with a level four FISC from the BSBI at a minimum. The locations of the quadrats associated with this survey are shown in **Figure 1.3**.

1.2.2.22 Each habitat or contiguous or connected habitat potentially valuable for its plant communities was assigned a number for the purposes of undertaking NVC surveys and referred to as a 'site' (e.g. site 1, site 2, site 3). At each site, a walkover was undertaken to select a sample location where vegetation could be recorded. A sample location within each site was chosen based on similar stands of vegetation. The vegetation was then sampled using quadrats distributed in the stand.

1.2.2.23 For woodland sites, a 50 m x 50 m quadrat was used to record the tree and shrub data. For woodland ground flora, 4 m x 4 m or 10 m x 10 m quadrats were used. Within small woodland blocks, where five 50 m x 50 m samples could not be taken due to the woodland's size (i.e. smaller than 50 m x 50 m), the whole woodland stand was used as the quadrat for canopy and the understorey. Within such areas 4 m x 4 m or 10 m x 10 m quadrats were recorded for the field and ground layers.

1.2.2.24 Within each quadrat, all species were recorded with an estimate of percentage cover and abundance using the Domin scale (Rodwell, 2006), which is a measure of percentage cover per plant species within a survey quadrat (see **Table 1.3** below).

Table 1.3: Domin scale

Percentage of quadrat (%)	Domin Value
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
<4 (many individuals)	3
<4 (several individuals)	2
<4 (few individuals)	1

1.2.2.25 A frequency value for each species, depending on the number of quadrats in which it was recorded, was calculated for each group of quadrats in a sample of similar vegetation, as per **Table 1.4** below.

Table 1.4: Frequency class of each species recorded (adapted from Rodwell, 2006)

Frequency value	Percentage of quadrats (%)	Measure of frequency
I	1-20	Scarce
II	21-40	Occasional
III	41-60	Frequent
IV	61-80	Constant
V	81-100	Constant

1.2.2.26 Data collected from each site was reviewed to ascertain its vegetation type as defined in the five published British Plant Communities volumes (Rodwell, 1991a; 1991b; 1992; 1995; 2000). This was done manually through use of the keys and the floristic tables provided in the British Plant Communities volumes and by visual comparison of the collected data with the published data. Plant species were identified and recorded onsite using The Wildflower Key (Rose and O'Reilly, 2006), Colour Identification Guide to Grasses, Sedges, Rushes, and Ferns (Rose, 1989) for higher plants and the Mosses and Liverworts of Britain and Ireland (Atherton, *et al*., 2010) for bryophytes.

1.2.2.27 NVC communities were identified by the presence of constant species, i.e., species that are almost always present and tend to be reasonably abundant. Subcommunities were indicated by the presence of differential and/or preferential species. Preferential species are plants which are distinctly more frequent within one or more of the subcommunities than the others. Differential species have a more exclusive affiliation.

1.2.2.28 The computer program MAVIS (Modular Analysis of Vegetation Information System) was used to facilitate comparison of data collected from each site with published data and aid the assignment of sites to a plant community. The tabulated results of the NVC surveys were entered into MAVIS. Matching coefficients were computed between the published floristic tables and the NVC survey results. Both the output from MAVIS and the manual assignment of data were compared to ascertain the most appropriate plant community.

1.2.2.29 Each plant community is defined by an NVC name and code as listed within floristic tables within the British Plant Communities volumes. The code starts with one or two letters corresponding to their vegetation type, followed by a number starting with one and increasing sequentially for each different plant community, for example ‘MG7’, which is the rye grass leys and related grasslands plant community.

1.2.2.30 Each plant community also has their own sub-communities based on differences in species composition. Where a sub-community has been identified, these are defined by lower case letters. In the case of MG7, this could be MG7a, MG7b through to MG7f.

1.2.2.31 Botanical nomenclature used in this technical report is as per the New Flora of the British Isles, Fourth Edition (Stace, 2019).

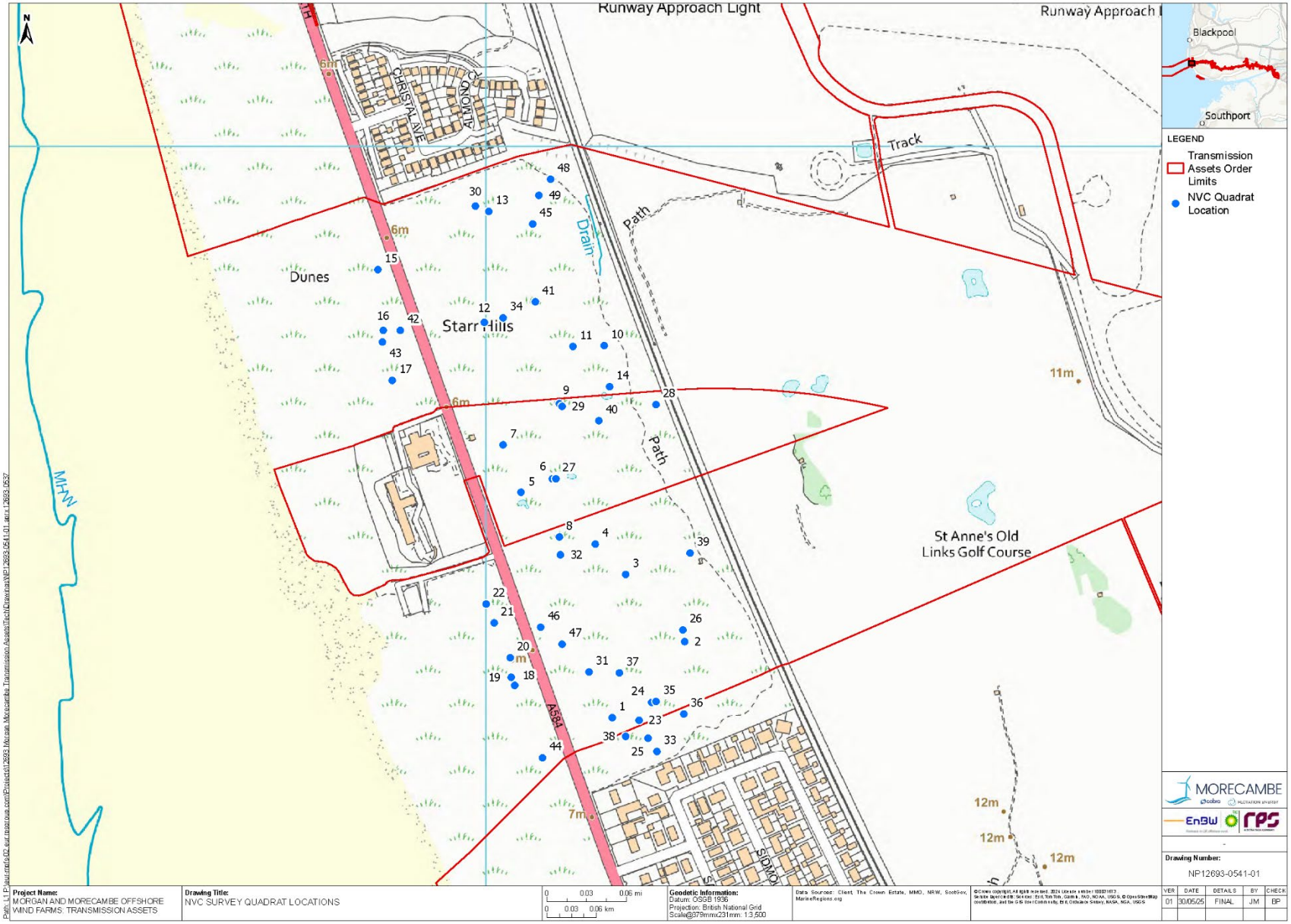

Figure 1.3: NVC quadrat locations

1.3 Results

1.3.1 Desk study

1.3.1.1 For the small percentage of the survey area where access for survey was not available, aerial photographs were used to identify habitats.

1.3.1.2 For full desk study results relevant to habitats present within the phase 1 habitat, NVC and hedgerow survey areas, refer to Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

1.3.1.3 An NVC survey of the sand dunes was produced for the Fylde Sand Dunes Project (Skelcher 2016). A brief review of that report is presented here, relating to the section of the sand dunes within the Onshore Order Limits.

1.3.1.4 From west (seaward side) moving east towards Clifton Drive North, the NVC communities start with bare sand and pioneer dune vegetation, grading into the Lytham St Annes Dunes Site of Special Scientific Interest (SSSI). SD4 *Elymus* foredune and SD5 *Elymus* mobile dune and SD6 *Ammophila* mobile dunes dominate initially and then as the dunes become more stable, the SD7 *Ammophila – Festuca* fixed dune community dominates, grading further into SD8 *Festuca – Galium* dune grassland and SD9 *Ammophilia - Arrhenatherum* dune grassland closer to the road. MG7e Modified Dune Grassland is also present here. Interspersed within the fixed dune and dune grassland communities are dune slacks, predominantly SD16 *Salix – Holcus* dune slacks.

1.3.1.5 East of Clifton Drive North, and up to the railway line and the boundary of Lytham St Annes Dunes SSSI, communities are predominantly SD8, SD9 and SD16 with areas of MG7e and SD7, with abundant areas of SD16.

1.3.1.6 Digitised results of the Skelcher (2016) survey are shown in **Figure 1.4** below.

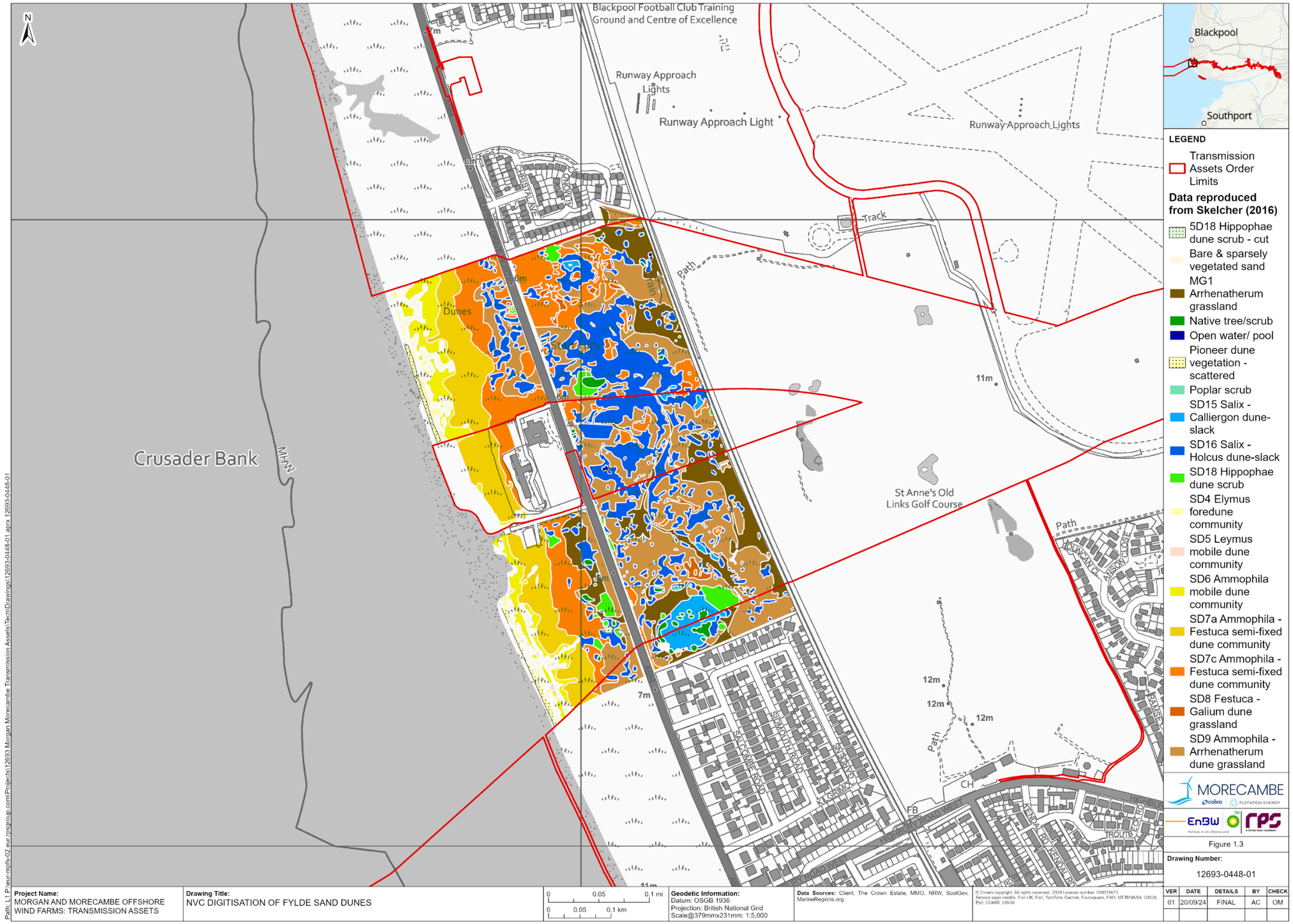

Figure 1.4: NVC digitisation of Fylde sand dunes (from Skelcher (2016))

1.3.2 Site-specific surveys

Phase 1 Habitat Survey

1.3.2.1 Habitat types recorded within the survey area are presented in **Table 1.5** below. The table includes the phase 1 habitat code, habitat type, relative frequency, the published description of the habitat type and its location within the phase 1 habitat survey area. The area in hectares (ha) or length (m) of each habitat type recorded within the phase 1 habitat survey area are provided in **Table 1.6** below.

1.3.2.2 The location and extent of habitat types located within the phase 1 habitat survey area is shown in **Figure 1.5** to **Figure 1.12.**

1.3.2.3 Target notes as numbered on **Figure 1.5** to **Figure 1.12**are of Invasive Non-Native Species (INNS) recorded during phase 1 habitat surveys. Full records are provided in **Appendix A** of this annex.

1.3.2.4 Lengths of hedgerows, including those assessed as being 'important' are covered separately in **section 1.1.3**. Lengths of watercourses are also covered in **section 1.1.3**.

Figure 1.5: Phase 1 – Section 1, habitat survey results

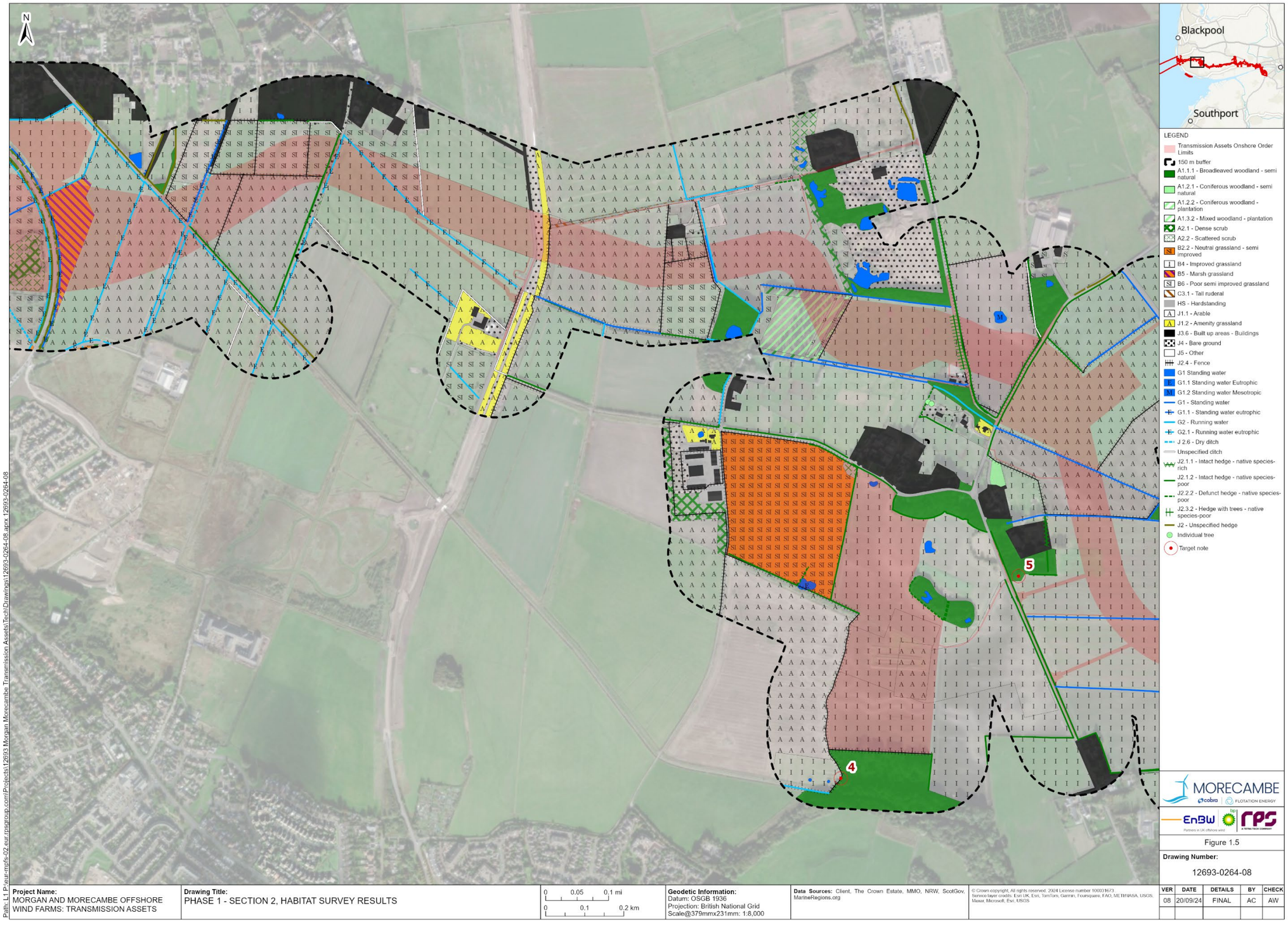

Figure 1.6: Phase 1 – Section 2, habitat survey results

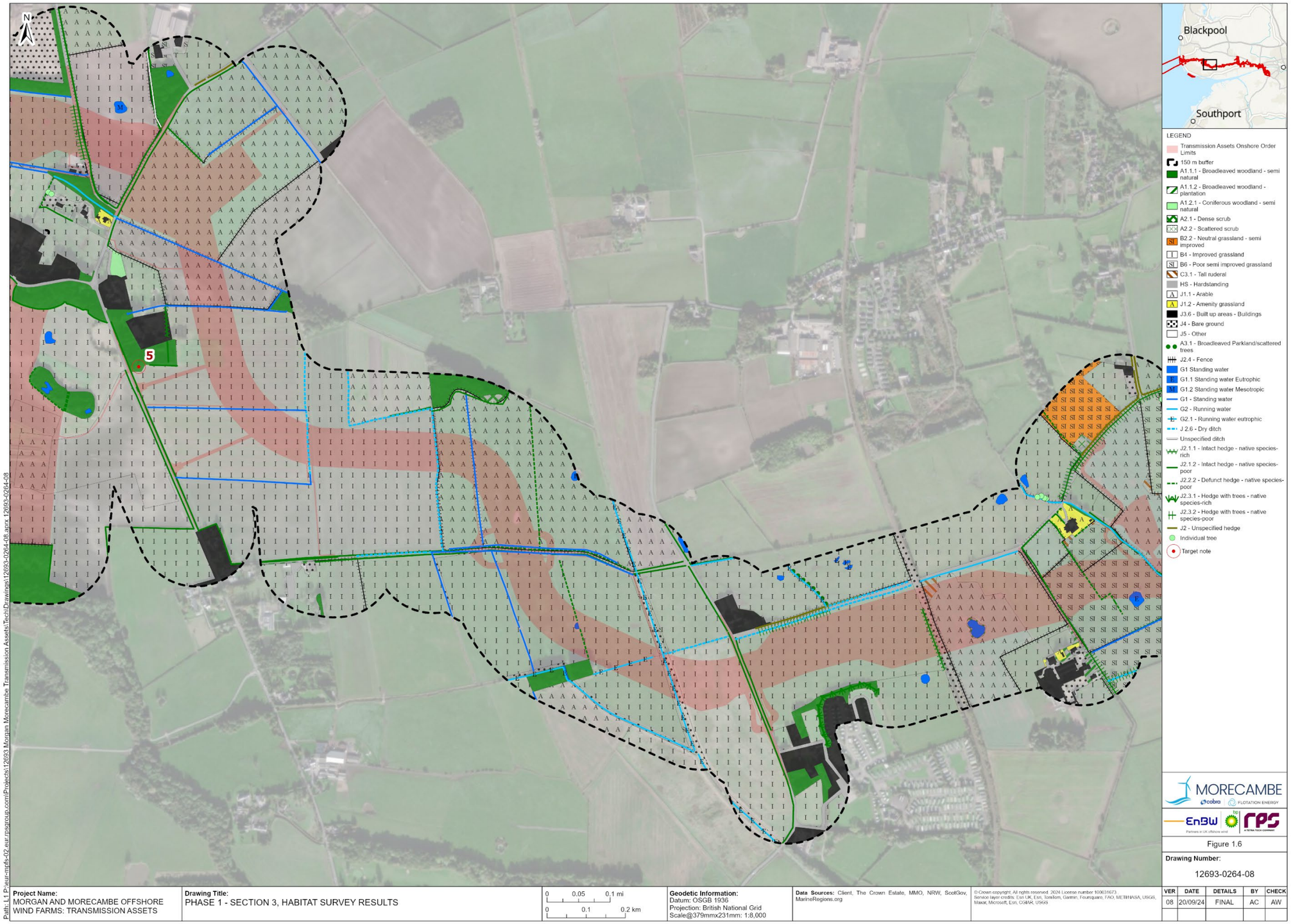

Figure 1.7: Phase 1 – Section 3, habitat survey results

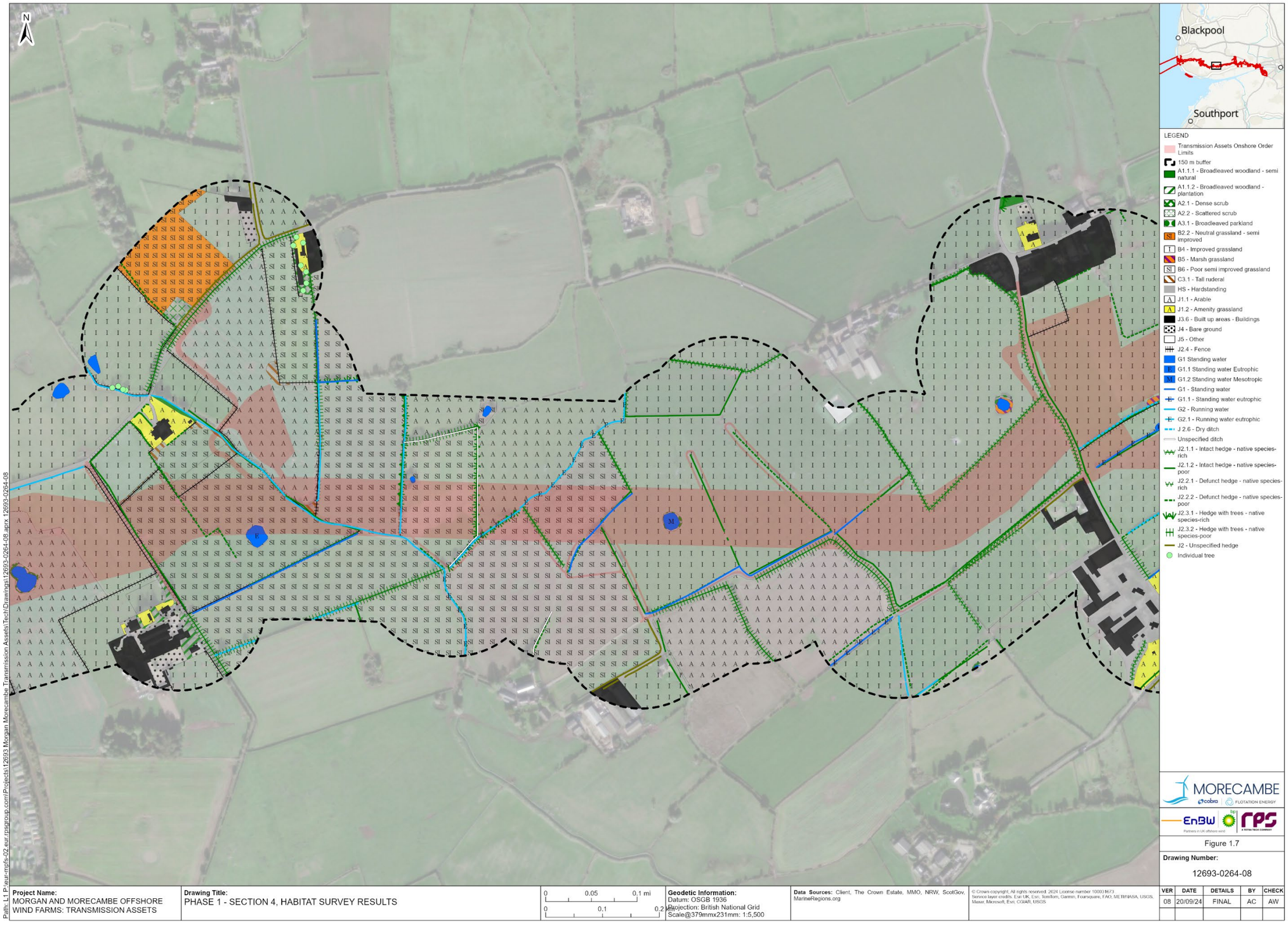

Figure 1.8: Phase 1 – Section 4, habitat survey results

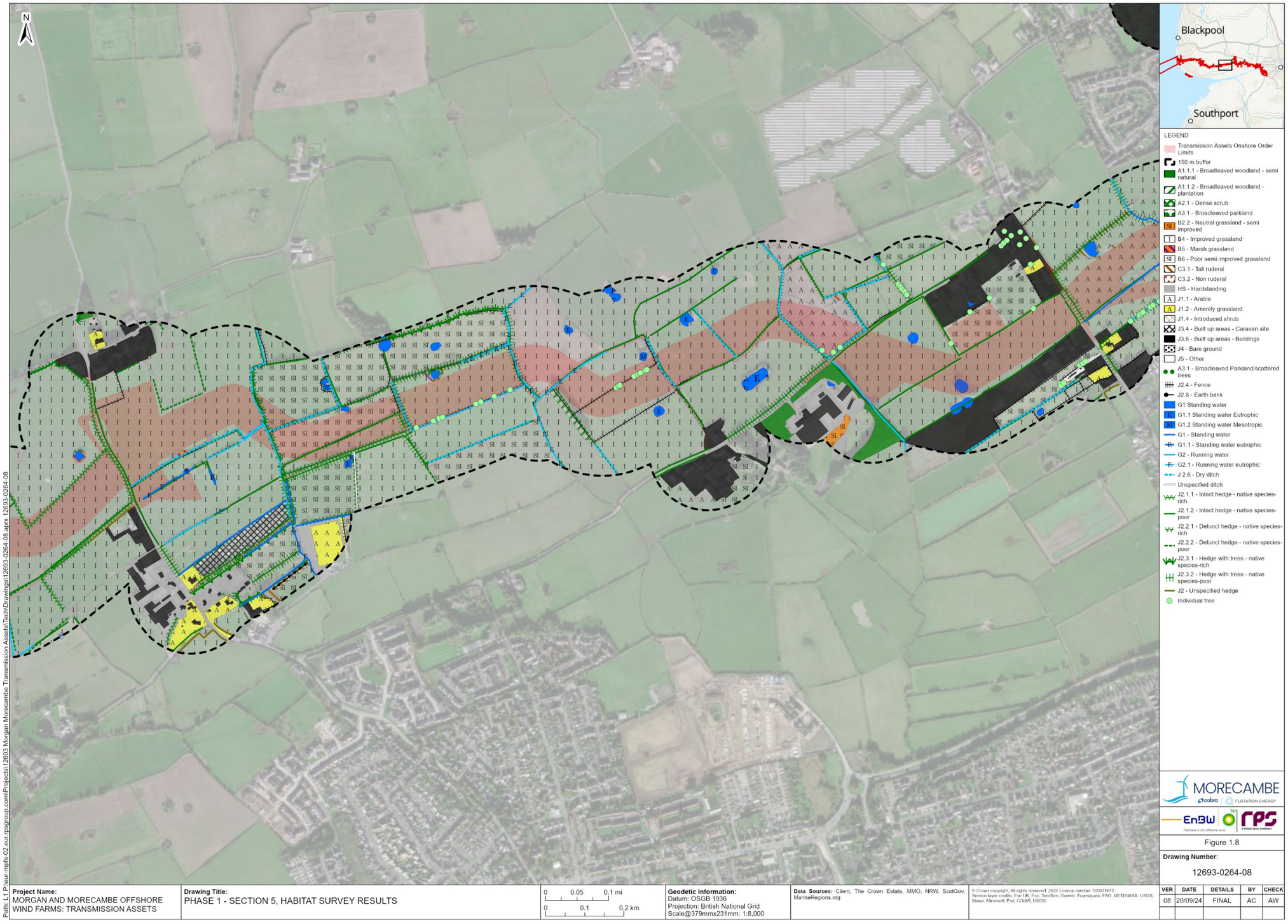

Figure 1.9: Phase 1 – Section 5, habitat survey results

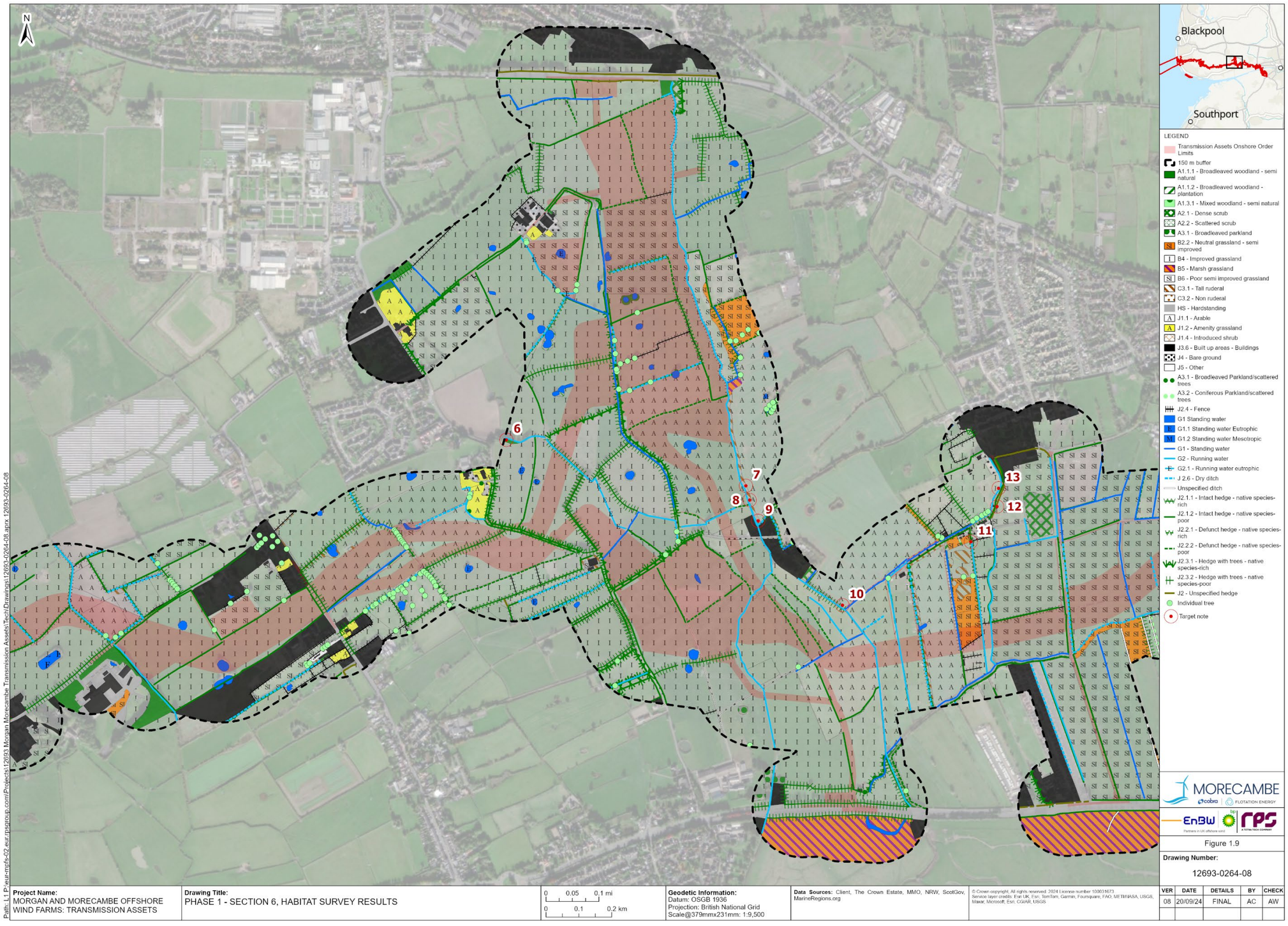

Figure 1.10: Phase 1 – Section 6, habitat survey results

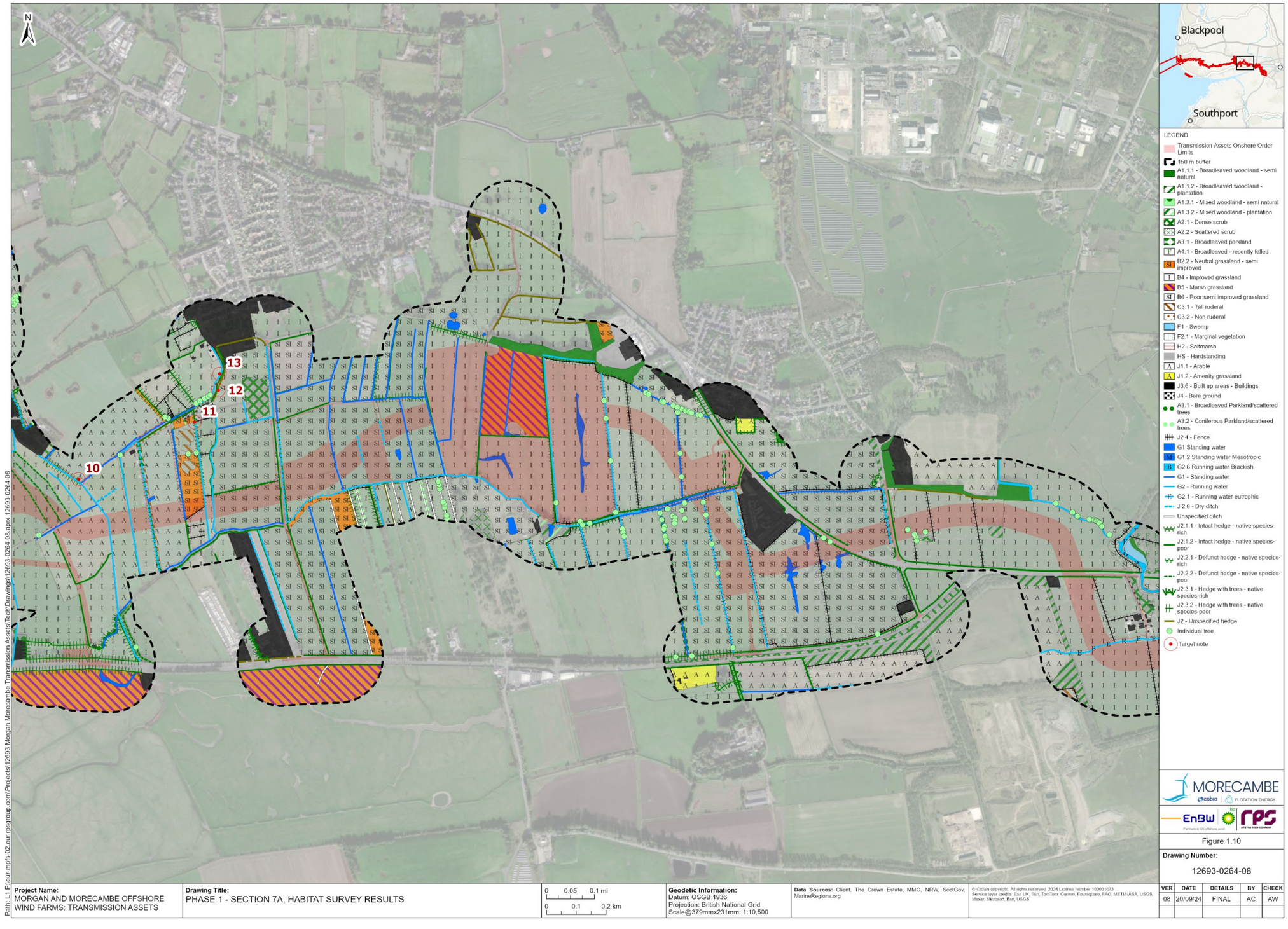

Figure 1.11: Phase 1 – Section 7A, habitat survey results

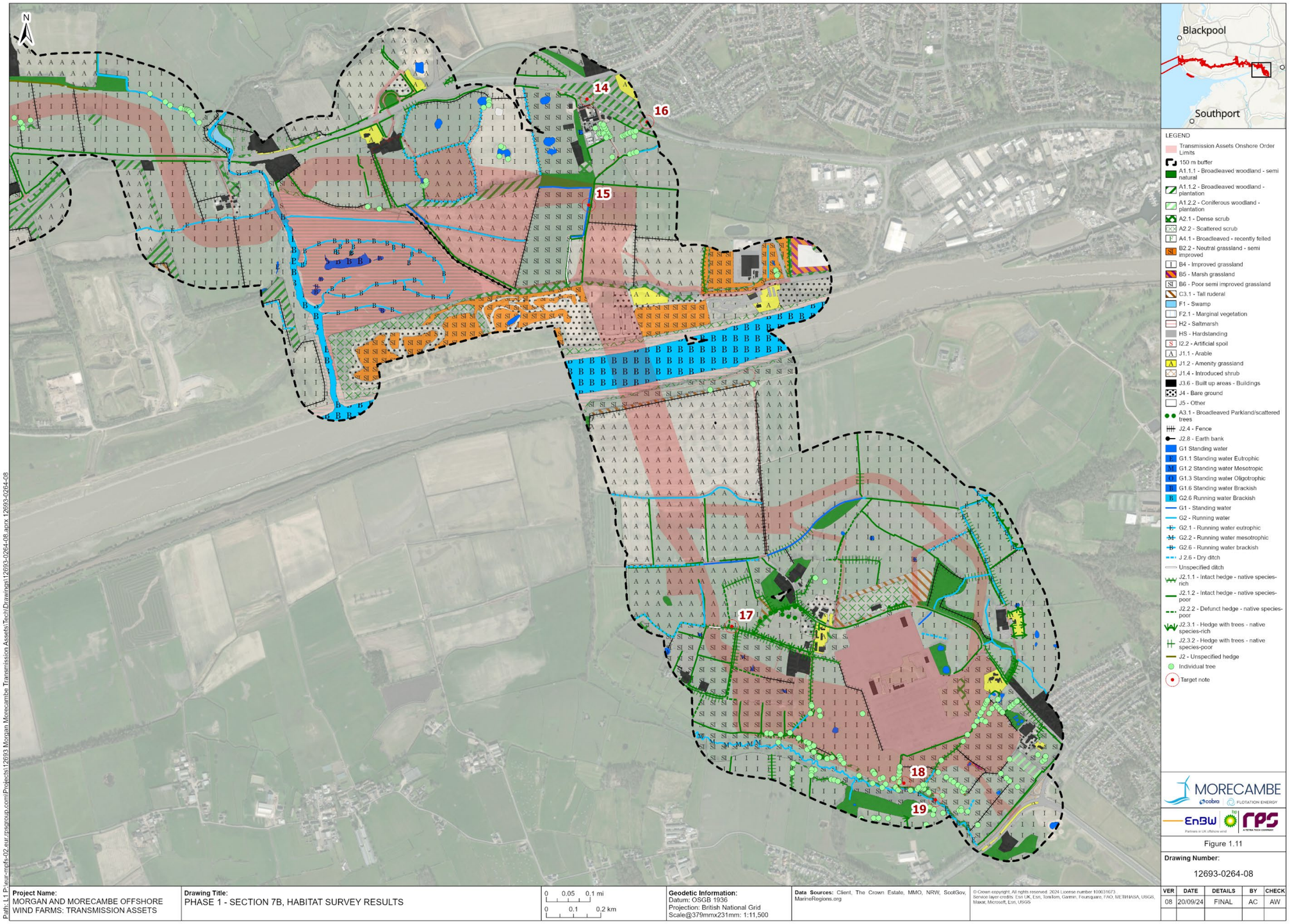

Figure 1.12: Phase 1 – Section 7B, habitat survey results

Table 1.5: Habitat types identified within the phase 1 habitat survey area

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
A.1.1.1	**Semi-natural broadleaved woodland** – vegetation dominated by broadleaved trees more than 5 m high when mature, forming distinct canopy and must not have obviously been planted by humans.	Occasional	Present within sections 1, 2, 3, 6, 7a and 7b in small areas and outside the Transmission Assets Order Limits.
A.1.1.2	**Plantation broadleaved woodland** – vegetation dominated by broadleaved trees more than 5 m high when mature, forming distinct canopy and has obviously been planted by humans (evidenced by structured planting, use of guards etc).	Occasional	Present in sections 1, 4, 7a and 7b in small areas only and outside the Transmission Assets Order Limits.
A1.2.1	**Semi natural coniferous woodland -** vegetation dominated by coniferous trees more than 5 m high when mature, forming distinct canopy and must not have obviously been planted by humans.	Rare	Outside of the Transmission Assets Order Limits only.
A.1.2.2	**Plantation coniferous woodland** – vegetation dominated by coniferous trees more than 5 m high when mature, forming distinct canopy and has obviously been planted by humans (evidenced by structured planting, use of guards etc).	Rare	Present in section 2 and outside the Transmission Assets Order Limits.
A.1.3.1	**Semi-natural mixed woodland** – vegetation dominated by a mix of broadleaved and coniferous trees (Neither can exceed 90 percent (%) dominancy) more than 5 m high when mature, forming distinct canopy and must not have obviously been planted by humans.	Rare	Present only outside the Transmission Assets Order Limits.
A.1.3.2	**Plantation mixed woodland** – comprises vegetation dominated by a mix of broadleaved and coniferous trees (with neither exceeding 90% dominancy) more than 5 m high when mature and has obviously been planted by humans (evidenced by structured planting, use of guards etc.	Rare	Present in sections 2 and 7a and outside the Transmission Assets Order Limits.
A.2.1	**Dense/continuous scrub** – Dense seral or climax vegetation dominated by locally native shrubs, usually less than 5 m tall with few scattered trees.	Occasional	Present in all sections in small areas aside from 7a and outside the Transmission Assets Order Limits.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
A.2.2	**Scattered scrub** – Seral or climax vegetation dominated by locally native shrubs, usually less than 5 m tall with few scattered trees.	Rare	Present in sections 1, 2 7b and outside the Transmission Assets Order Limits.
A3.1	**Broadleaved Parkland/scattered trees –** Trees which cover less than 30% of ground.	Rare	Present in section 4 in small amounts, and outside the Transmission Assets Order Limits.
A.4.1	**Broadleaved woodland recently felled** – The only areas of felled trees which should be included in this category are those whose future land use is uncertain, for instance when it is not clear whether they are to be replanted or used for crops.	Rare	Present only outside of the Transmission Assets Order Limits.
B.2.2	**Semi-improved neutral grassland** – Grassland that retains some features of a neutral grassland but due to limited modification by artificial fertilisers, slurry, intensive grazing, herbicide application or drainage has a less diverse range of species and may include some agricultural species.	Occasional	Present within section 2 (over 10 ha), and small sections within sections 7a and 7b. Also found outside the Transmission Assets Order Limits.
B.4	**Improved grassland** – Grasslands heavily effected by grazing, drainage, herbicide application, inorganic fertilisers or heavy doses of manure or slurry. Very limited range of grass species and few common forbs, mainly those resistant to mowing or grazing such as dandelion *Taraxicum officinale,* white clover *Trifolium repens,* sorrel *Rumex acetosa,* daisy *Bellis perennis,* meadow buttercup *Ranunculus acris,* rye grass *Lolium perenne* and bulbous buttercup *Ranunculus bulbosus*. Important indicators include: • bright green, lush and even sward, dominated by grasses; • low diversity of forb species; and • more than 50% rye grass, white clover and other agricultural species.	Common	Present throughout all sections surveyed in large amounts.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
B.5	**Marsh/marshy grassland** – This is a diffuse category covering certain purple moor grass Molinia grasslands, grasslands with a high proportion of rush *Juncus* species, sedge *Carex* species or meadow sweet *Filipendula ulmaria* and wet meadows and pastures supporting communities of species such as marsh marigold *Caltha palustris* or valarian *Valeriana* species, where broadleaved herbs rather than grasses, predominate.	Occasional	Present mostly in areas outside of the Transmission Assets Order Limits and within small areas of sections 1, 5 6 and 7b, with larger areas present in section 7a.
B.6	**Poor semi-improved grassland** – Similar to neutral semi-improved grassland but with less species diversity and likely to have less species indicative of the substrate conditions.	Common	Present throughout all sections.
C.3.1	**Tall ruderal** – Tall perennial or biennial dicotyledons, usually more than 25 centimetre (cm) high of species such rosebay willowherb *Chamaenerion angustifolium,* common nettle *Urtica dioica* and Japanese knotweed *Reynoutria japonica*.	Frequent	Present throughout all sections apart from section 5.
C3.2	**Other tall herb and fern – non-ruderal** – Non-wooded stands of species such as beech fern *Oreopteris limbosperma,* lady fern *Athyrium felix-femina,* buckler ferns *Dryopteris* species or great wood-sedge *Luzula sylvatica*.	Rare	Present within section 5 and outside the Transmission Assets Order Limits.
F1	**Swamp –** Presence of tall emergent vegetation often within areas between open water and exposed land. May occasionally be seldom immersed when succeeding to marshy grassland.	Rare	Present only outside the Transmission Assets Order Limits.
F2.1	**Marginal and inundation – marginal vegetation** – This category encompasses all narrow strips of emergent vegetation occurring on the (often steep) margins of lowland watercourses, where the water table is permanently high.	Rare	Present only outside the Transmission Assets Order Limits.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
G.1	**Standing water** – Includes lakes, reservoirs, pools, flooded gravel pits, ponds, water-filled ditches, canals and brackish lagoons. Ditches usually measured in linear lengths rather than areas – refer to section **1.3.2.** Note that some of the standing water recorded in this survey is periodically dry, for example at Morecambe substation.	Common	Present throughout all sections.
G1.1	**Standing water eutrophic –** Nutrient rich standing water. Ditches measured in linear lengths rather than areas – refer to **section 1.3.2.**	Rare	Present within sections 2, 4, 6 and 7b, and outside the Transmission Assets Order Limits.
G1.2	**Standing water mesotrophic –** Standing water moderately enriched with nutrients Ditches measured in linear lengths rather than areas – refer to **section 1.3.2**.	Rare	Present within sections 4 and 7b in small areas, and outside the Transmission Assets Order Limits.
G1.3	**Standing water oligotrophic –** standing water not enriched with nutrients.	Rare	Present outside of the Transmission Assets Order Limits only.
G.1.6	**Standing water brackish** –Standing water with salinity levels between freshwater and seawater.	Rare	Present only in section 7b northwest of the River Ribble within saltmarsh.
G.2	**Running water** – Rivers and streams with running water. Running water measured via linear length – refer to **section 1.3.2**.	Common	Present in all sections except 1 and 3.
G2.1	**Running water eutrophic –** Nutrient rich running water. Running water measured via linear length – refer to **section 1.3.2**.	Rare	Present in all sections except 7a
G2.2	**Running water mesotrophic –** Running water moderately enriched with nutrients. Running water measured via linear length – refer to **section 1.3.2**.	Rare	Present in section 6 in small amounts and outside the Transmission Assets Order Limits.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
G.2.6 B	**Running water brackish** – Running water with salinity levels between freshwater and seawater. Running water measured via linear length – refer to **section 1.3.2**.	Rare	Present in section 7b and outside the Transmission Assets Order Limits.
H1.1	**Intertidal mud/sand -** Intertidal habitat on mud/sand substrate.	Frequent	Present outside the Transmission Assets Order only.
H2	**Saltmarsh –** Coastal grassland with the presence of salt water. Salt tolerant species present.	Rare	Present within section 7b, and outside of the Transmission Assets Order Limits.
H6	**Sand-dune –** Accumulation of sand shaped into a mound with a ridge.	Rare	Present within section 1 in large amounts and outside the Transmission Assets Order Limits.
H6.5	**Dune grassland** – All grassland occurring on consolidated and flattened dunes should be classified in this category. Generally, little marram *Ammophila arenaria* will be present.	Rare	Present within section 1 in large amounts and outside the Transmission Assets Order Limits.
H6.6	**Dune heath** – All heathland occurring on consolidated and flattened dunes should be included in this category. Heather *Calluna* is usually the dominant ericoid, with grey heather and cross-leaved heath *Erica tetralix* also common. Sand sedge *Carex arenaria* is often present and lichens, particularly cup lichen *Cladonia* species, are often abundant. Occasionally, juniper *Juniperus communis* may be present.	Rare	Present only within section 1 in small amounts.
HS	**Hardstanding –** Hard artificial surface	Frequent	Present in all sections.
I2.2	**Spoil** – Includes abandoned industrial areas and tips of waste material such as coal mine spoil and slag.	Rare	Present only outside the Transmission Assets.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
J.1.1	**Arable** – Arable cropland, horticultural land, freshly ploughed land and recently re-seeded grassland, potentially managed for silage.	Common	Present throughout all sections.
J.1.2	**Amenity grassland** – This comprises intensively managed and regularly mown grasslands, typical of lawns, playing fields, golf course fairways and many urban 'savannah' parks, in which rye grass, with or without white clover, often predominates. The sward composition will depend on the original seed mixture used and on the age of the community. Herbs such as daisy, great plantain *Plantago major* and dandelion may be present.	Occasional	Present in all sections with larger areas present in section 1 and small amounts in sections 2 and 7b.
J1.4	**Cultivated/disturbed land, introduced shrub –** Shrub habitat dominated by vegetation that is not locally native.	Rare	Present in small areas of sections 1 and 7b and outside the Transmission Assets Order Limits.
J.2.1.1	**Intact native species rich hedge** – Hedge with at least five native species and little/no gaps. Measured in linear length – see **section 1.3.2**.	Occasional	Present in sections 3 to 6 and 7b in small amounts, and outside the Transmission Assets Order Limits.
J.2.1.2	**Intact native species poor hedge** – Hedge with less than five native species and little/no gaps. Measured in linear length – see **section 1.3.2**.	Frequent	Present throughout all sections except section 1, and outside the Transmission Assets Order Limits.
J.2.2.1	**Defunct native species rich hedge** – Hedge with at least five native species and gaps that render the barrier not stockproof. Measured in linear length – see **section 1.3.2**.	Occasional	Present in sections 4 to 6, and outside the Transmission Assets Order Limits.
J.2.2.2	**Defunct native species poor hedge** – Hedge with less than five native species and gaps that render the barrier not stockproof. Measured in linear length – see **section 1.3.2**.	Frequent	Present throughout all sections except section 1, and outside the Transmission Assets Order Limits.

Phase 1 habitat code (JNCC, 2010)	Habitat type	Relative frequency of habitat type (across survey area)	Location
J.2.3.1	**Native species rich hedge with trees** – Hedge with trees along its length with at least five native species. Measured in linear length – see **section 1.3.2**.	Occasional	Present within sections 4, 5, 6 and 7b, and outside the Transmission Assets Order Limits.
J.2.3.2	**Native species poor hedge with trees** – Hedge with trees along its length with less than five native species. Measured in linear length – see **section 1.3.2**.	Occasional	Present within sections 2 and 4 to 7b, and outside the Transmission Assets Order Limits.
J.2.4	**Fence.**	Frequent	Present throughout all sections.
J.2.6	**Dry ditch.** Measured in linear length - refer to **section 1.3.2**.	Frequent	Present throughout all sections.
J.2.8	**Earth bank.**	Rare	Only a short length present within section 7b.
J3.4	**Built up area, caravan site –** Area built up with the presence of caravans.	Rare	Present only outside the Transmission Assets Order Limits.
J.3.6	**Buildings** – Buildings or built-up areas. We have included concrete foundations in this category.	Common	Present in all sections apart from sections 3 and 4.
J.4	**Bare ground** – Bare ground includes any type of bare soil or other substrate not already covered in another habitat type (e.g., bare peat E4, intertidal H1, shingle H3).	Occasional	Present in all sections apart from section 1 and 4.
J.5	**Other habitat** – Any habitat not encompassed by other phase 1 habitat classifications.	Rare	Present in section 1 only, and outside the Transmission Assets Order Limits.

Table 1.6: Extent of habitat types identified within the survey area

Phase 1 habitat code and type	Section 1(ha)	Section 2(ha)	Section 3(ha)	Section 4(ha)	Section 5(ha)	Section 6(ha)	Section 7a (ha)	Section 7b (ha)	Grand Total (Onshore Order Limits) (ha)	Grand Total (Onshore Order Limits) (%)	150 m buffer (ha)	Grand Total (survey area) (ha)	Grand Total (survey area) (%)
A1.1.1 - Woodland - broad-leaved - semi-natural	0.10	0.01	0.01			0.08	0.00	0.89	**1.10**	**0.20%**	33.02	**34.12**	**1.77%**
A1.1.2 - Woodland - broad-leaved - plantation	0.22			0.01			0.11	0.98	**1.32**	**0.24%**	9.92	**11.23**	**0.58%**
A1.2.1 - Woodland - coniferous - semi-natural									**0.00**	**0.00%**	0.20	**0.20**	**0.01%**
A1.2.2 - Woodland - coniferous - plantation		0.82							**0.82**	**0.15%**	2.17	**3.00**	**0.16%**
A1.3.1 - Woodland - mixed - semi-natural							0.00		**0.00**	**0.00%**	0.03	**0.03**	**0.00%**
A1.3.2 - Woodland - mixed - plantation		0.05					0.12		**0.17**	**0.03%**	0.87	**1.04**	**0.05%**
A2.1 - Scrub - Dense/continuous	3.85	0.02	0.05	0.00	0.01	0.01		0.71	**4.65**	**0.84%**	11.19	**15.84**	**0.82%**
A2.2 - Scrub - scattered	1.56	0.12						0.52	**2.20**	**0.40%**	9.81	**12.01**	**0.62%**
A3.1 - Parkland/scattered trees - Broad-leaved				0.03					**0.03**	**0.00%**	0.36	**0.39**	**0.02%**
A4.1 - Recently-felled woodland - broad-leaved									**0.00**	**0.00%**	1.55	**1.55**	**0.08%**
B2.2 - Neutral grassland - semi-improved		10.56					0.41	0.03	**11.00**	**1.99%**	20.58	**31.58**	**1.63%**
B4 - Improved grassland	3.62	27.22	25.27	8.82	25.94	41.75	33.86	32.84	**199.33**	**36.15%**	493.29	**692.61**	**35.84%**
B5 - Marsh/marshy grassland	1.83				0.00	0.01	5.62	0.05	**7.51**	**1.36%**	11.88	**19.40**	**1.00%**
B6 - Poor semi-improved grassland	51.96	4.99	0.18	8.03	3.71	9.48	16.02	22.57	**116.94**	**21.21%**	241.46	**358.41**	**18.54%**
C1.2 - Bracken - scattered	0.15	0.20	0.11	0.07		0.06	0.08	0.57	**1.25**	**0.23%**	6.36	**7.61**	**0.39%**
C3.1 - Tall ruderal					0.09				**0.09**	**0.02%**	0.19	**0.28**	**0.01%**
C3.2 - Non-ruderal									**0.00**	**0.00%**	0.26	**0.26**	**0.01%**
F1 - Swamp									**0.00**	**0.00%**	0.03	**0.03**	**0.00%**
F2.1 - Marginal vegetation		10.56					0.41	0.03	**11.00**	**1.99%**	20.58	**31.58**	**1.63%**
G1 - Standing water	0.38	0.02	0.14	0.00	0.09	0.25	0.84	0.10	**1.83**	**0.33%**	5.45	**7.28**	**0.38%**
G1.1 - Standing water - eutrophic		0.09		0.04		0.06		0.01	**0.20**	**0.04%**	1.00	**1.21**	**0.06%**
G1.2 - Standing water - mesotrophic				0.07				0.04	**0.10**	**0.02%**	0.14	**0.24**	**0.01%**
G1.3 - Standing water - oligotrophic									**0.00**	**0.00%**	0.04	**0.04**	**0.00%**
G1.6 - Standing water - brackish								0.69	**0.69**	**0.12%**	0.00	**0.69**	**0.04%**
G2.6 - Running water - brackish									**0.00**	**0.00%**	0.00	**0.00**	**0.00%**
H1.1 - Intertidal - mud/sand	31.32								**31.32**	**5.68%**	40.50	**71.82**	**3.72%**
H2 - Saltmarsh								22.25	**22.25**	**4.04%**	5.33	**27.58**	**1.43%**
H6 - Sand dune	12.04								**12.04**	**2.18%**	23.14	**35.18**	**1.82%**

Phase 1 habitat code and type	Section 1(ha)	Section 2(ha)	Section 3(ha)	Section 4(ha)	Section 5(ha)	Section 6(ha)	Section 7a (ha)	Section 7b (ha)	Grand Total (Onshore Order Limits) (ha)	Grand Total (Onshore Order Limits) (%)	150 m buffer (ha)	Grand Total (survey area) (ha)	Grand Total (survey area) (%)
H6.5 - Sand dune - dune grassland	9.09								**9.09**	**1.65%**	3.89	**12.99**	**0.67%**
H6.6 - Sand dune - dune heath	0.50								**0.50**	**0.09%**	0.14	**0.64**	**0.03%**
H6.8 - Sand dune - open heath	7.56	1.38	0.88	0.56	0.72	1.44	1.34	15.05	**28.93**	**5.25%**	53.47	**82.40**	**4.26%**
HS - Hard standing									**0.00**	**0.00%**	0.01	**0.01**	**0.00%**
I2.2 - Artificial spoil	2.54	13.43	14.29	2.32	1.62	14.25	1.54	28.64	**78.62**	**14.26%**	204.72	**283.34**	**14.66%**
J1.1 - Cultivated/disturbed land - arable	10.25	0.19				0.00		0.05	**10.49**	**1.90%**	25.65	**36.14**	**1.87%**
J1.2 - Cultivated/disturbed land - amenity grassland	0.15							0.04	**0.18**	**0.03%**	0.44	**0.63**	**0.03%**
J1.4 - Cultivated/disturbed land - introduced shrub									**0.00**	**0.00%**	1.38	**1.38**	**0.07%**
J3.4 - Built-up areas - caravan site	1.05	0.07		0.00	0.02	0.08	0.03	0.33	**1.58**	**0.29%**	133.63	**135.20**	**7.00%**
J3.6 - Built-up areas - buildings		0.31	0.59	0.00	0.11	0.86	0.50	2.39	**4.76**	**0.86%**	24.38	**29.14**	**1.51%**
J4 - Bare ground	0.08								**0.08**	**0.01%**	1.24	**1.32**	**0.07%**
J5 - Other habitat	31.32								**31.32**	**5.68%**	40.50	**71.82**	**3.72%**
Total	**138.34**	**59.47**	**41.54**	**19.95**	**32.31**	**68.36**	**60.48**	**130.97**	**551.42**	**100.00%**	1,381.35	**1,932.77**	**100.00%**

Hedgerow survey

1.3.2.5 For ease of reference a set of figures showing hedgerows mapped during the phase 1 survey are provided in **Figure 1.13** to **Figure 1.20**. These figures also show the locations of 'important' hedgerows.

1.3.2.6 A table showing the length and type of hedgerows surveyed within the survey area is provided in **Table 1.7**.

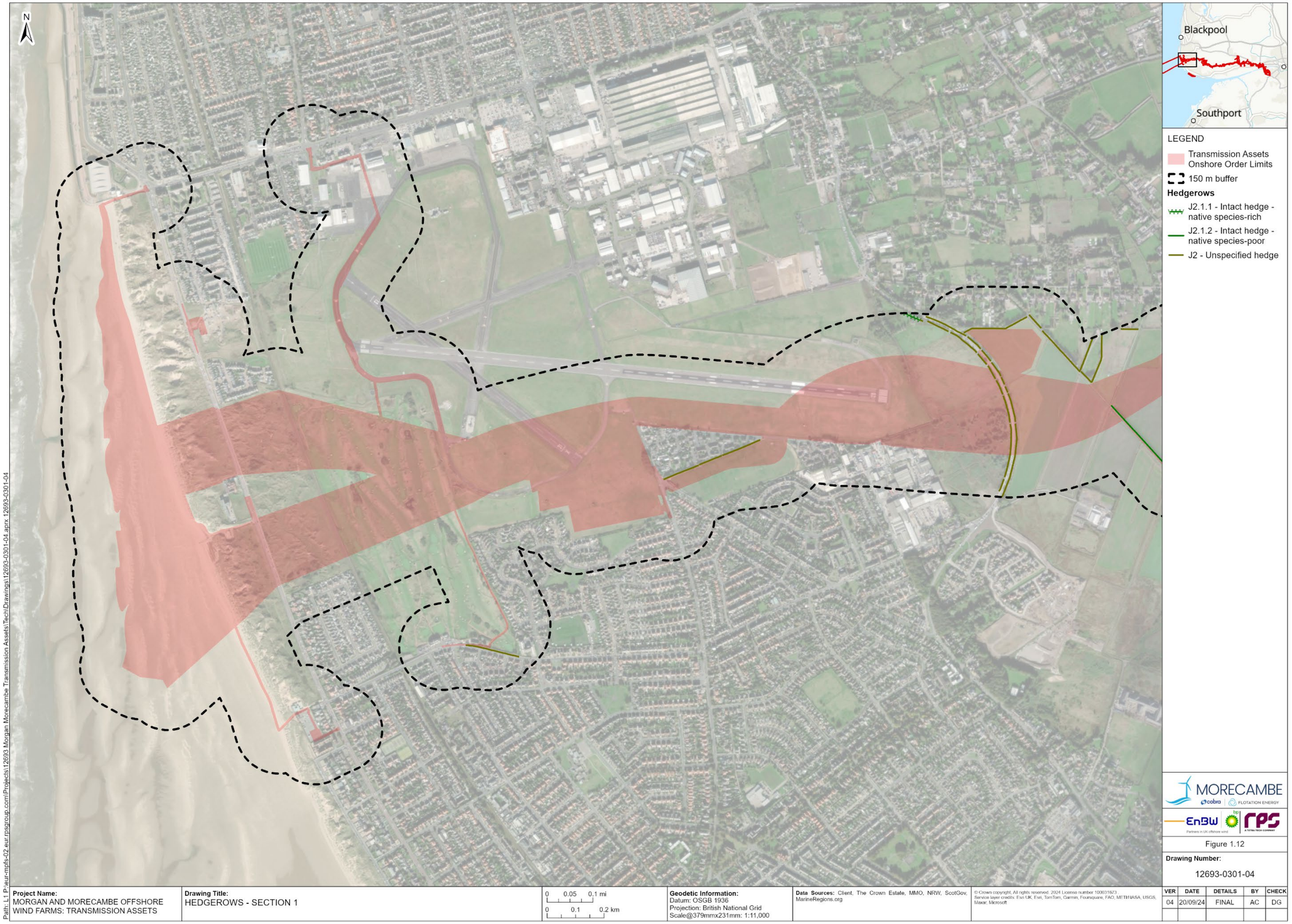

Figure 1.13: Hedgerows – Section 1

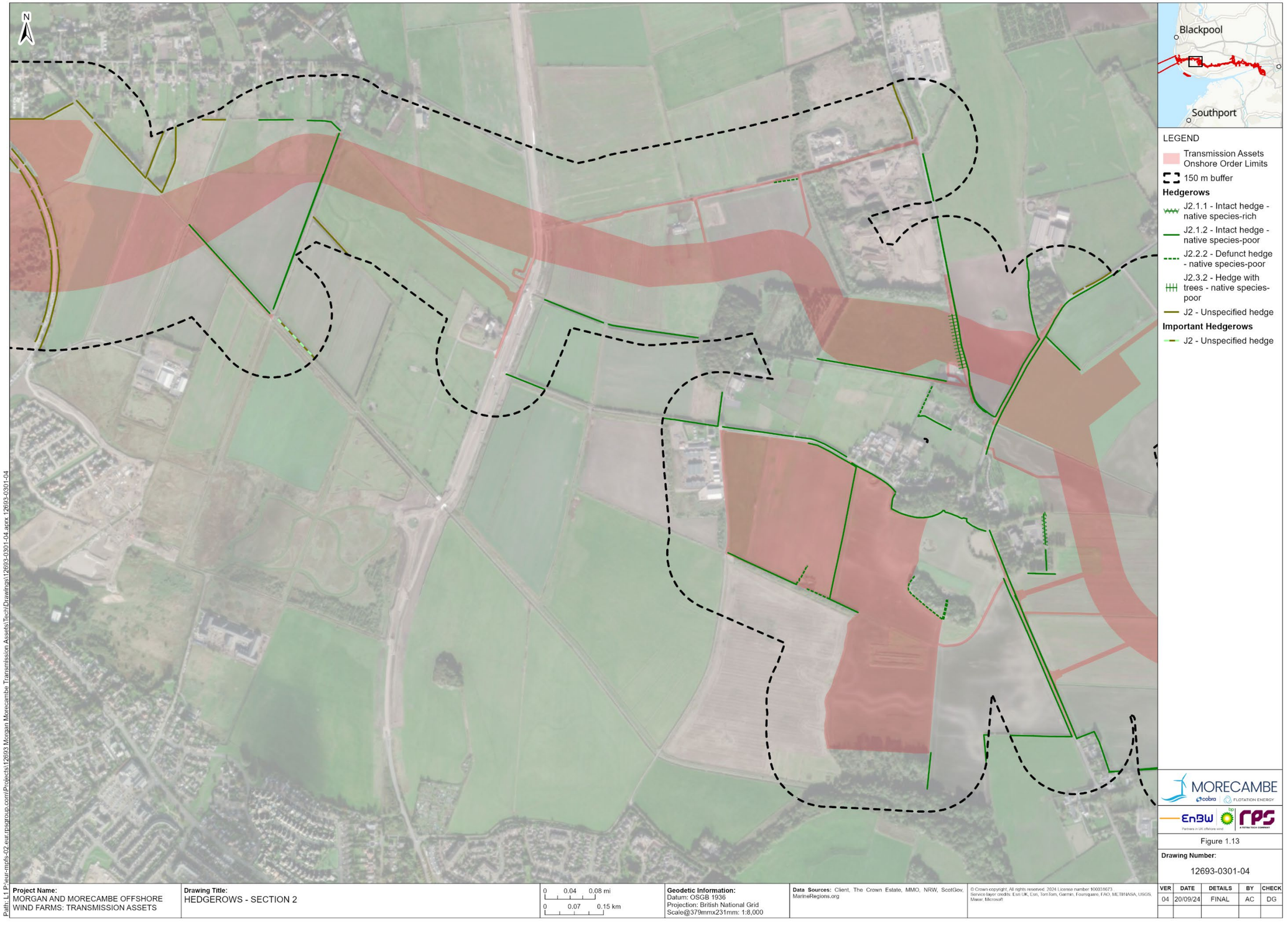

Figure 1.14: Hedgerows – Section 2

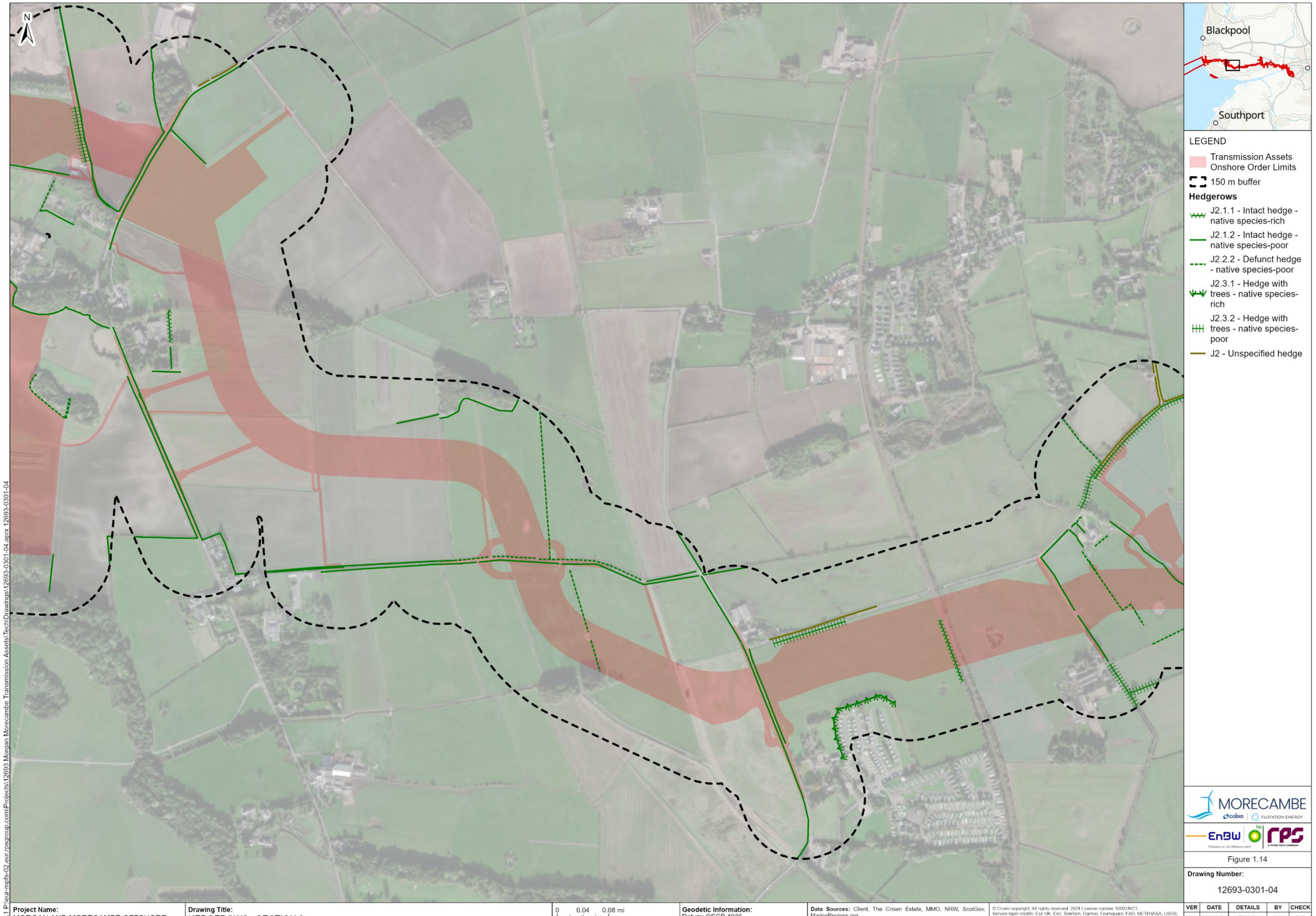

Figure 1.15: Hedgerows – Section 3

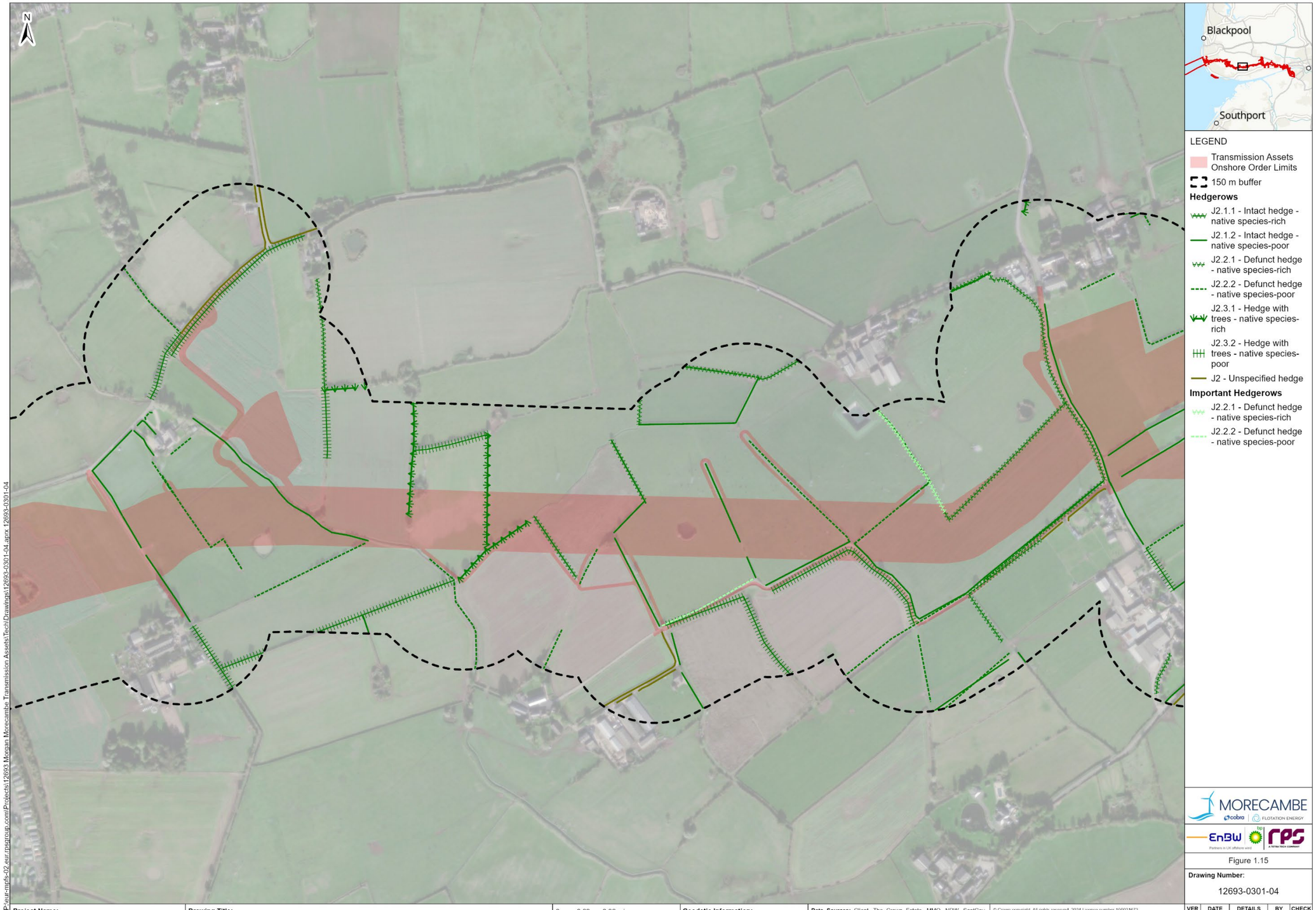

Figure 1.16: Hedgerows – Section 4

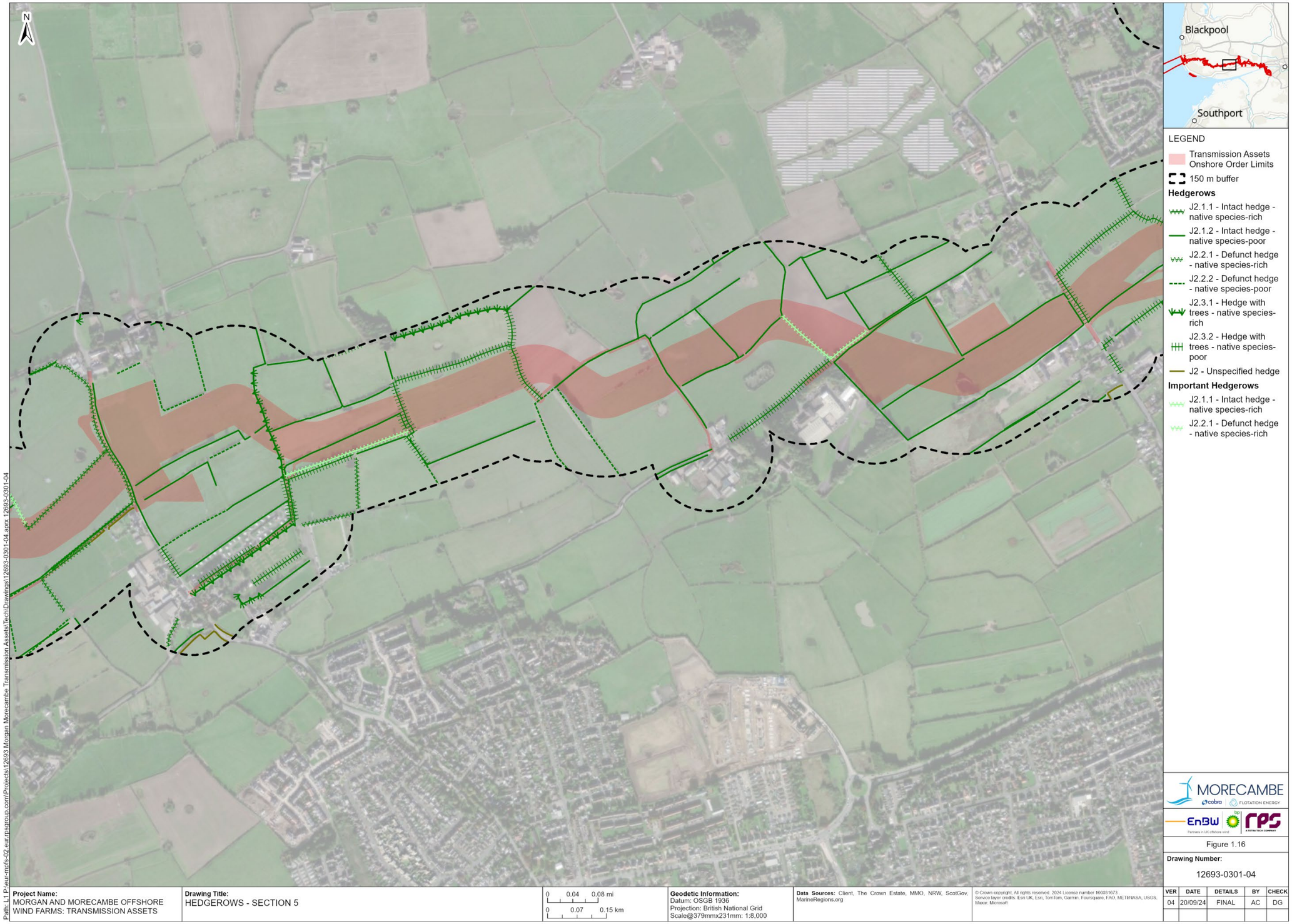

Figure 1.17: Hedgerows – Section 5

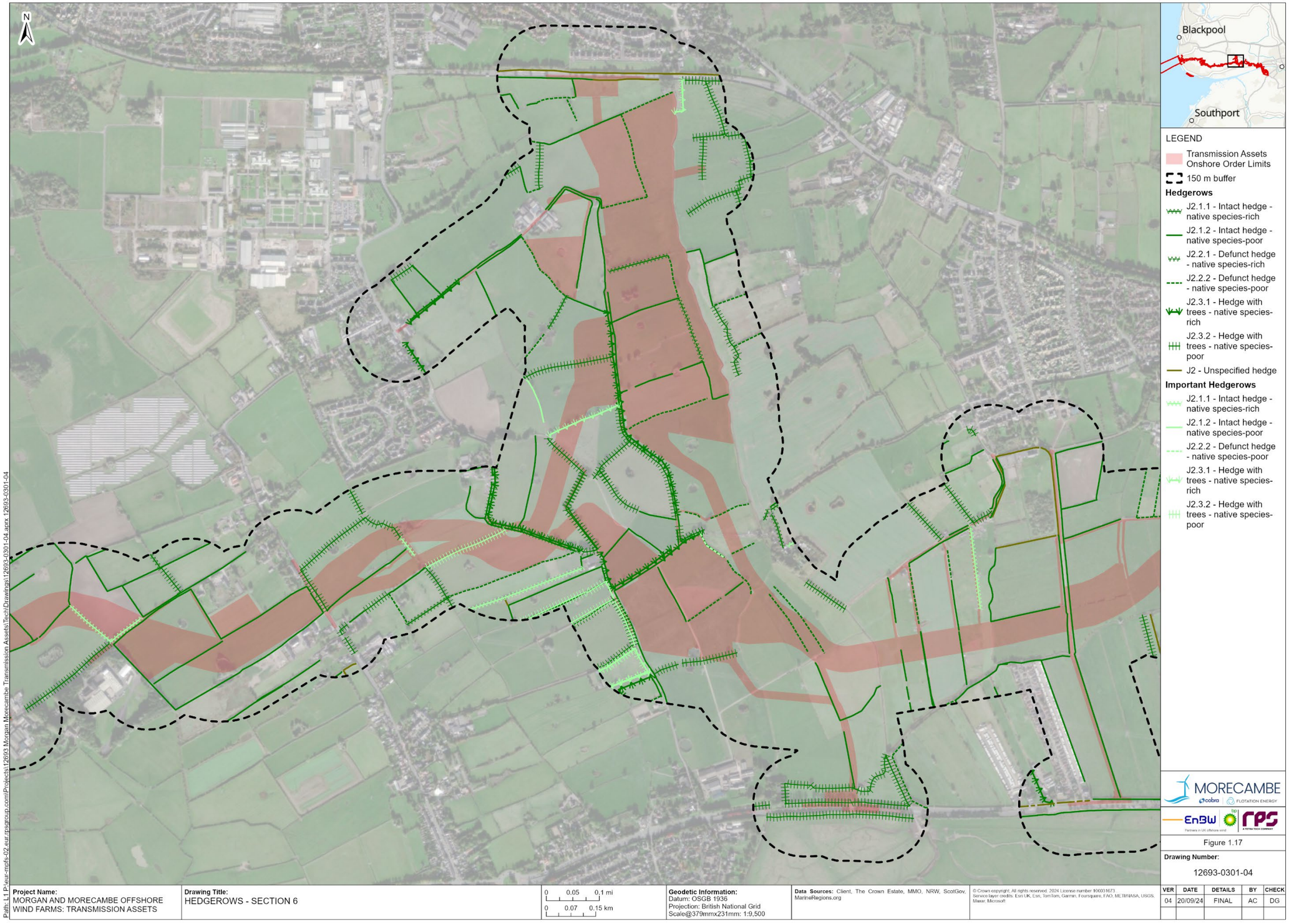

Figure 1.18: Hedgerows – Section 6

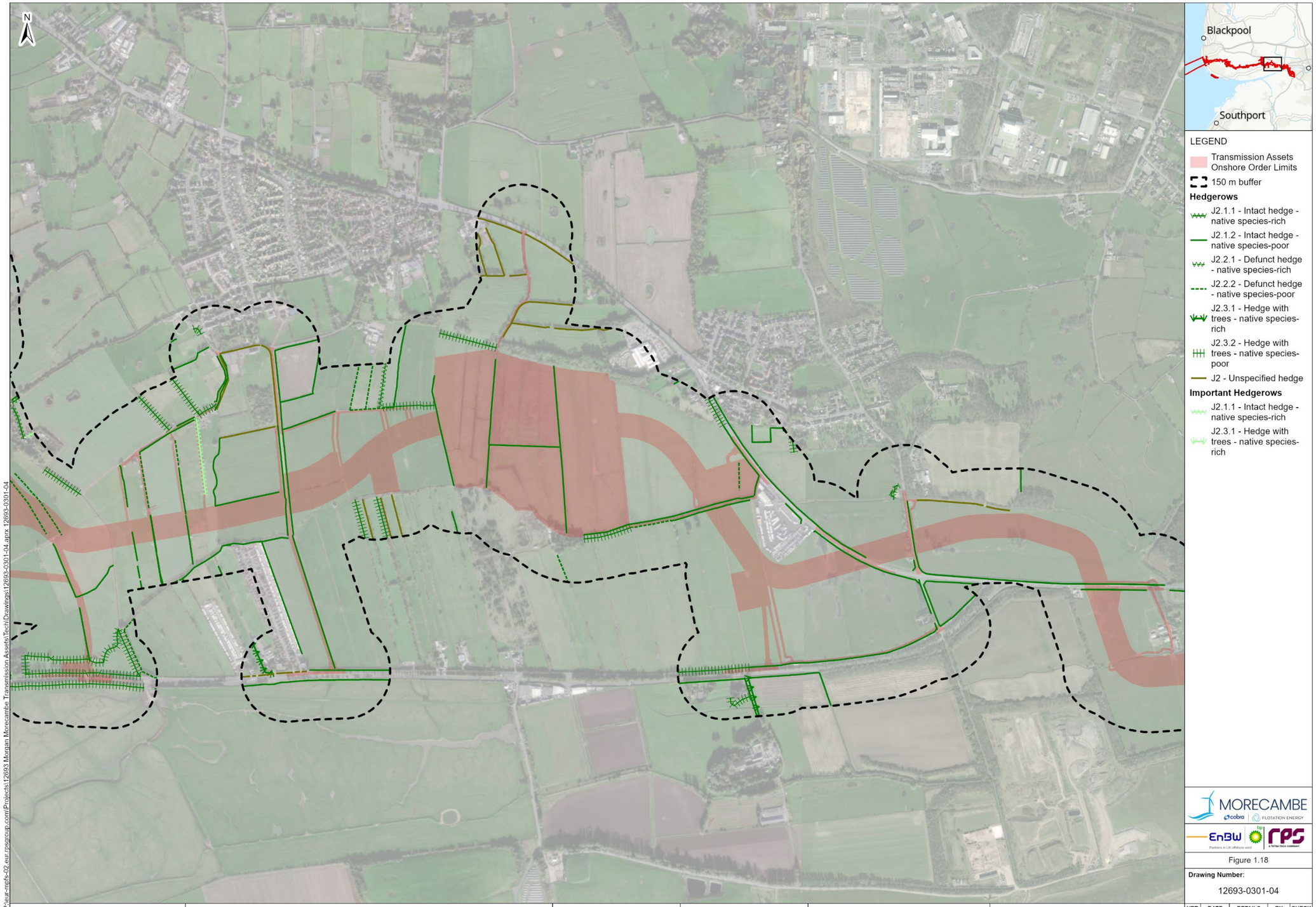

Figure 1.19: Hedgerows – Section 7a

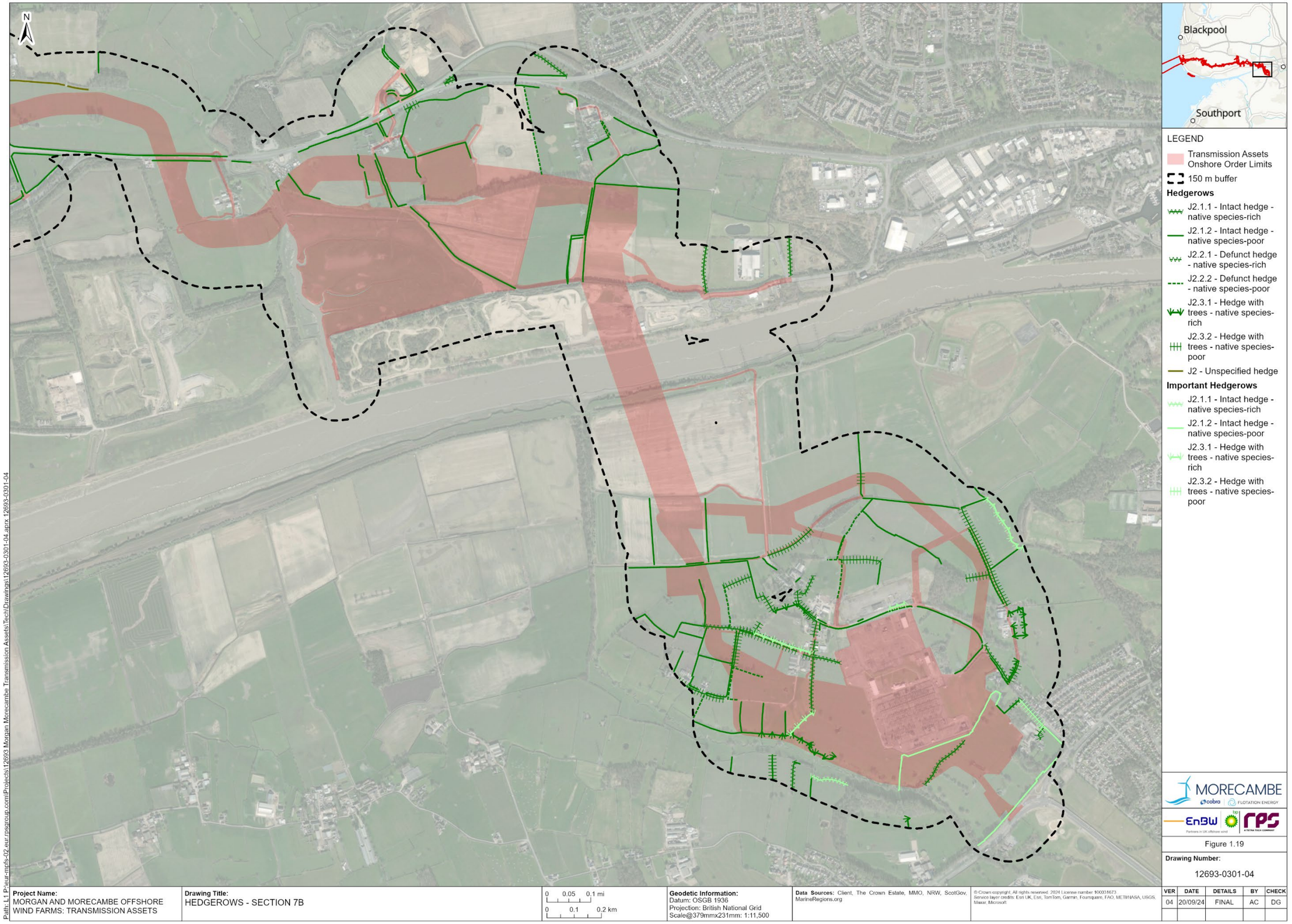

Figure 1.20: Hedgerows – Section 7b

Table 1.7: Hedgerow lengths identified within the survey area

Hedgerow type	Section 1 (m)	Section 2 (m)	Section 3 (m)	Section 4 (m)	Section 5 (m)	Section 6 (m)	Section 7a (m)	Section 7b (m)	Grand total (Onshore Order Limits) (m)	Grand total (Onshore Order Limits) (%)	150 m buffer (m)	Grand total (survey area) (m)	Grand total (survey area) (%)
J2.1.1 - Intact hedge - native species-rich			124	76	442	197		459	**1,298**	**4.41%**	3,123	**4,421**	**3.86%**
J2.1.2 - Intact hedge - native species-poor		2,337	1,315	614	2,259	3,060	3,409	5,290	**18,284**	**62.04%**	44,040	**62,324**	**54.36%**
J2.2.1 - Defunct hedge - native species-rich				407	254	206			**867**	**2.94%**	2,029	**2,897**	**2.53%**
J2.2.2 - Defunct hedge - native species-poor		252	326	475	9	1,722	182	225	**3,190**	**10.82%**	9,595	**12,785**	**11.15%**
J2.3.1 - Hedge with trees - native species-rich				216	173	958		509	**1,856**	**6.30%**	4,833	**6,689**	**5.83%**
J2.3.2 - Hedge with trees - native species-poor		140		249	358	1,660	0	602	**3,009**	**10.21%**	13,528	**16,537**	**14.42%**
J2 - Unspecified hedge	835					120	9		**965**	**3.27%**	8,038	**9,003**	**7.85%**
Total	**835**	**2,729**	**1,765**	**2,037**	**3,494**	**7,923**	**3,601**	**7,085**	**29,469**	**100.00%**	**85,187**	**114,656**	**100.00%**
Important hedgerow length (total)				**18**	**442**	**281**		**697**	**1,437**	**4.88%**	**4,606**	**6,043**	**5.27%**

Watercourses

1.3.2.7 For ease of reference a set of figures showing watercourses mapped during the phase 1 survey are provided in **Figure 1.21** to **Figure 1.28**.

1.3.2.8 A table showing the length and type of hedgerows surveyed within the survey area is provided in **Table 1.8**.

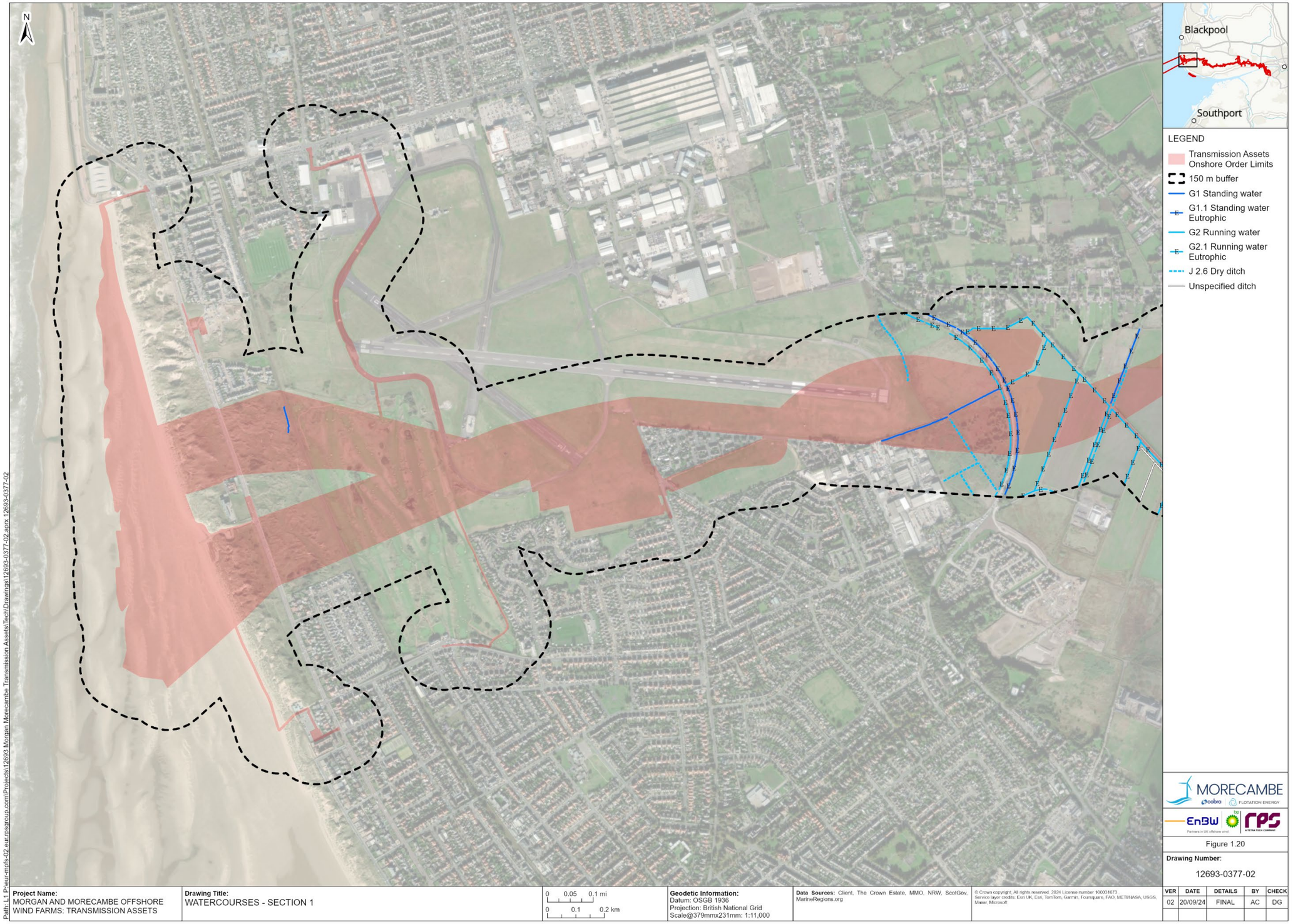

Figure 1.21: Watercourses – Section 1

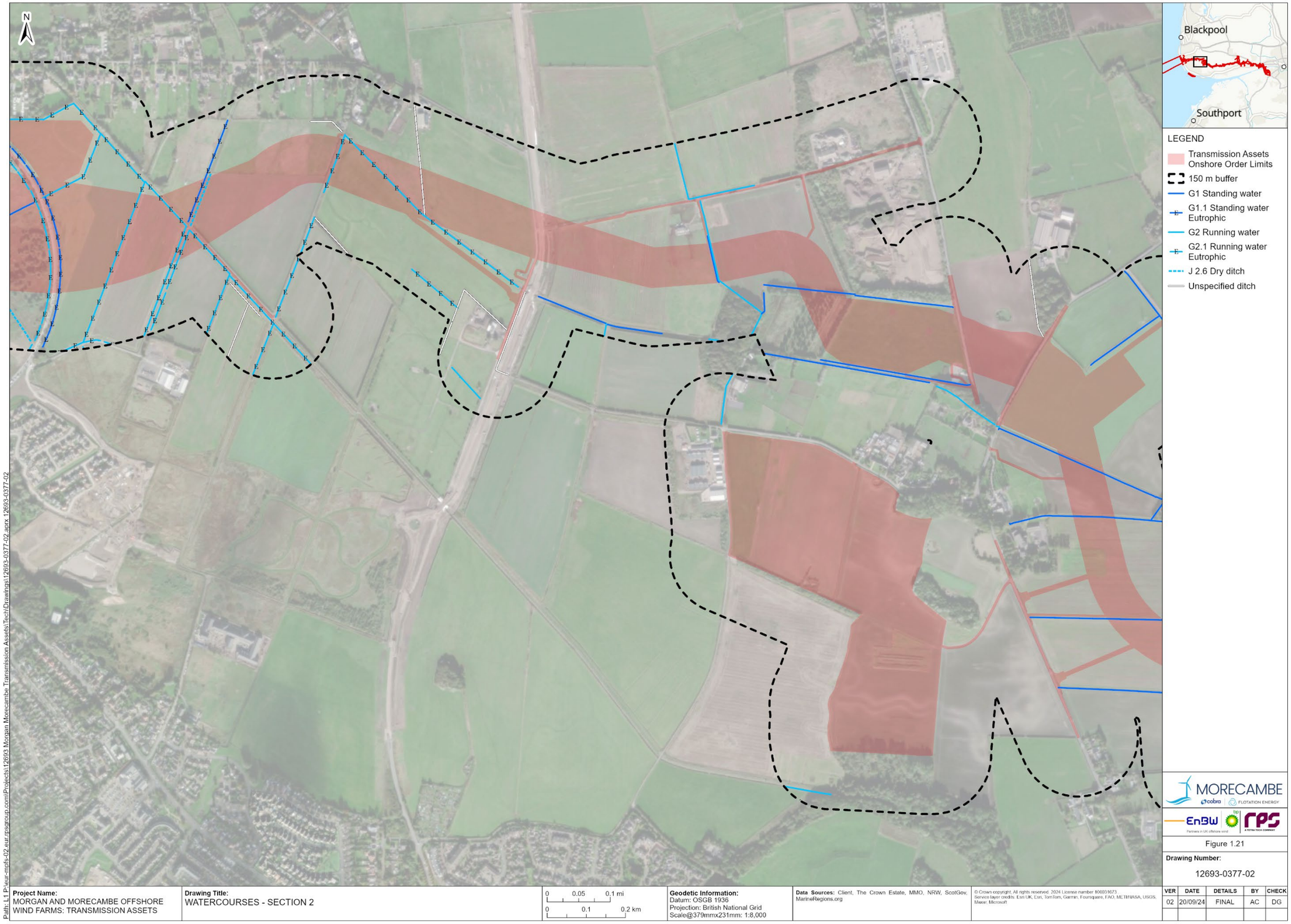

Figure 1.22: Watercourses – Section 2

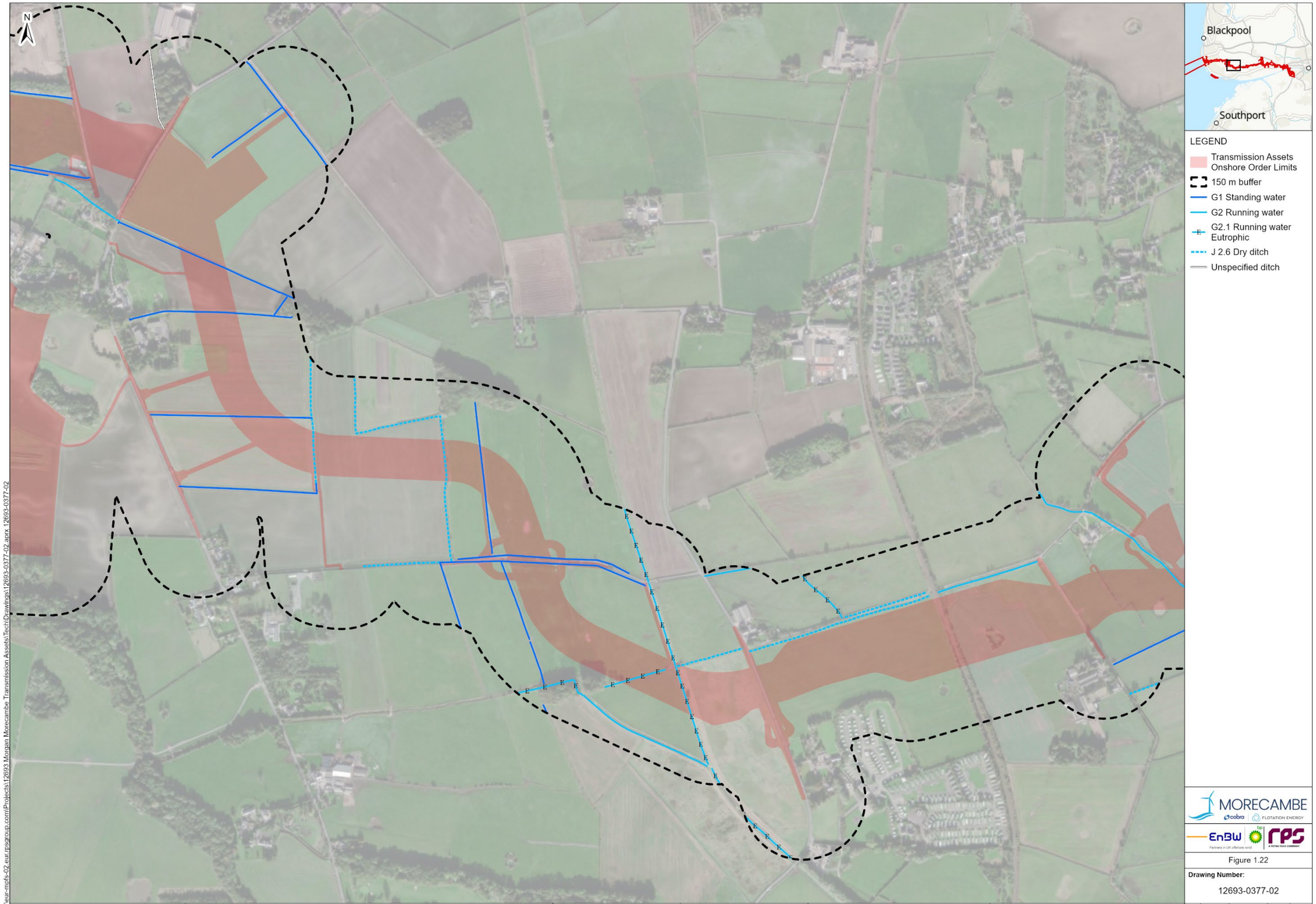

Figure 1.23: Watercourses – Section 3

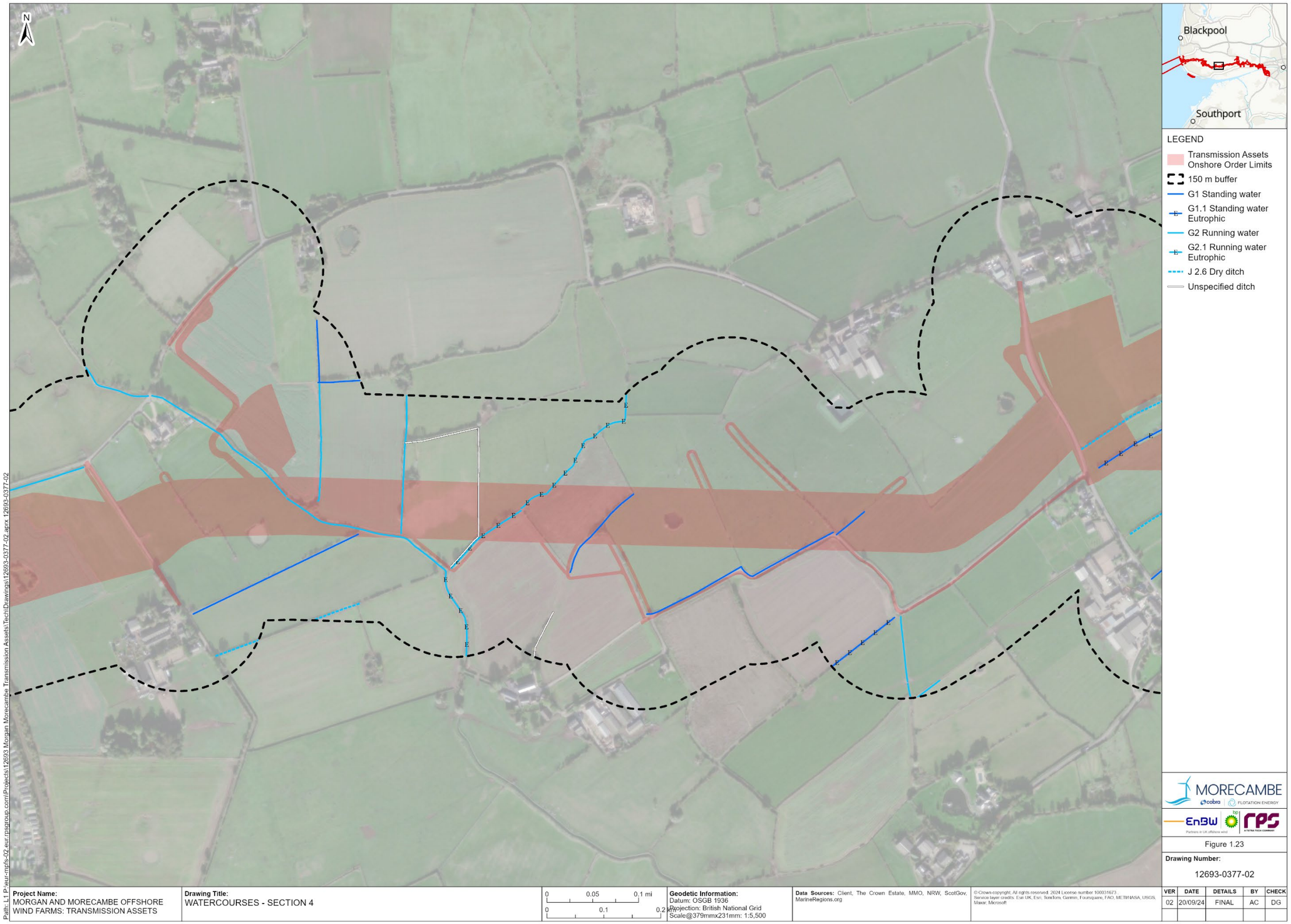

Figure 1.24: Watercourses – Section 4

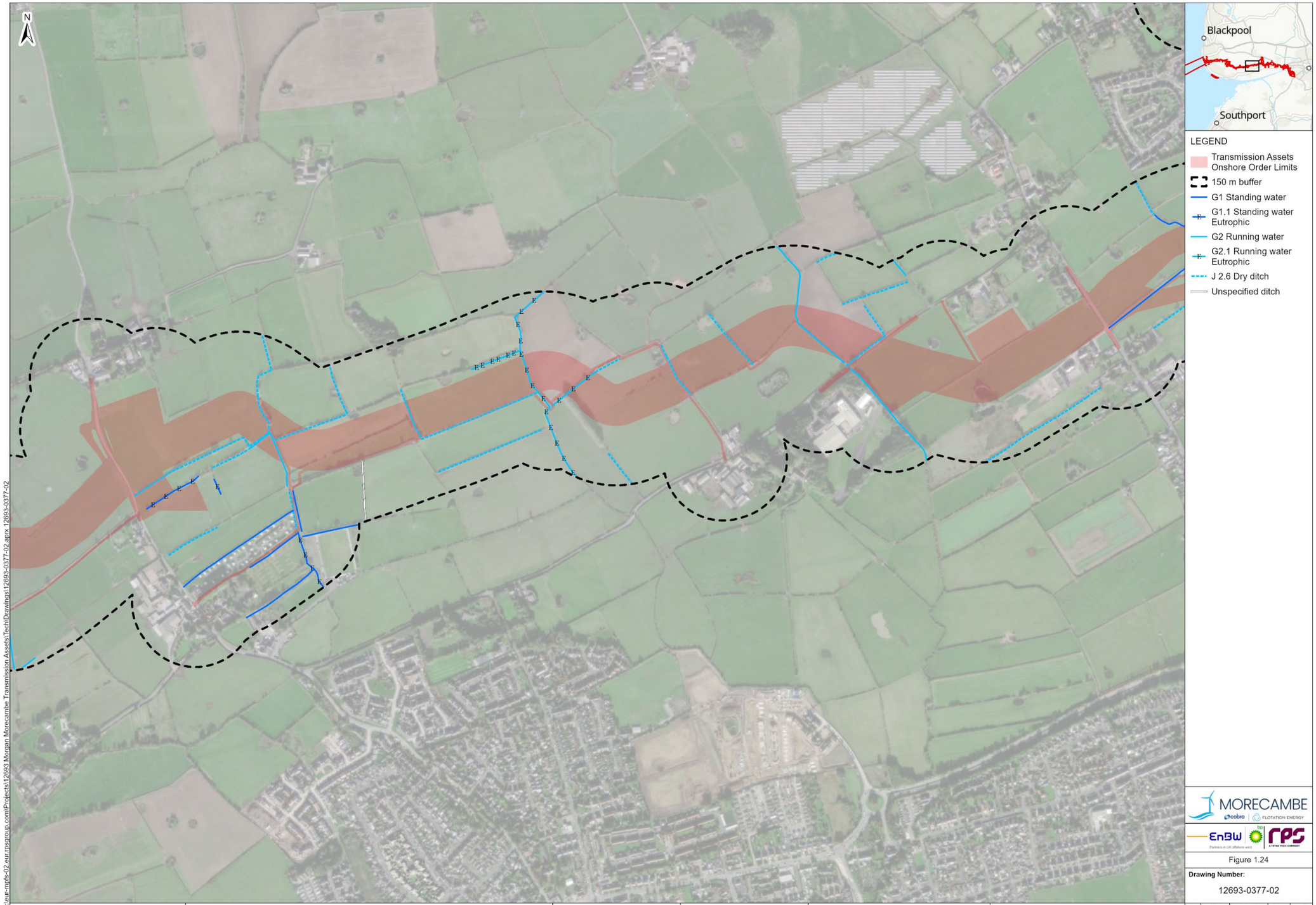

Figure 1.25: Watercourses – Section 5

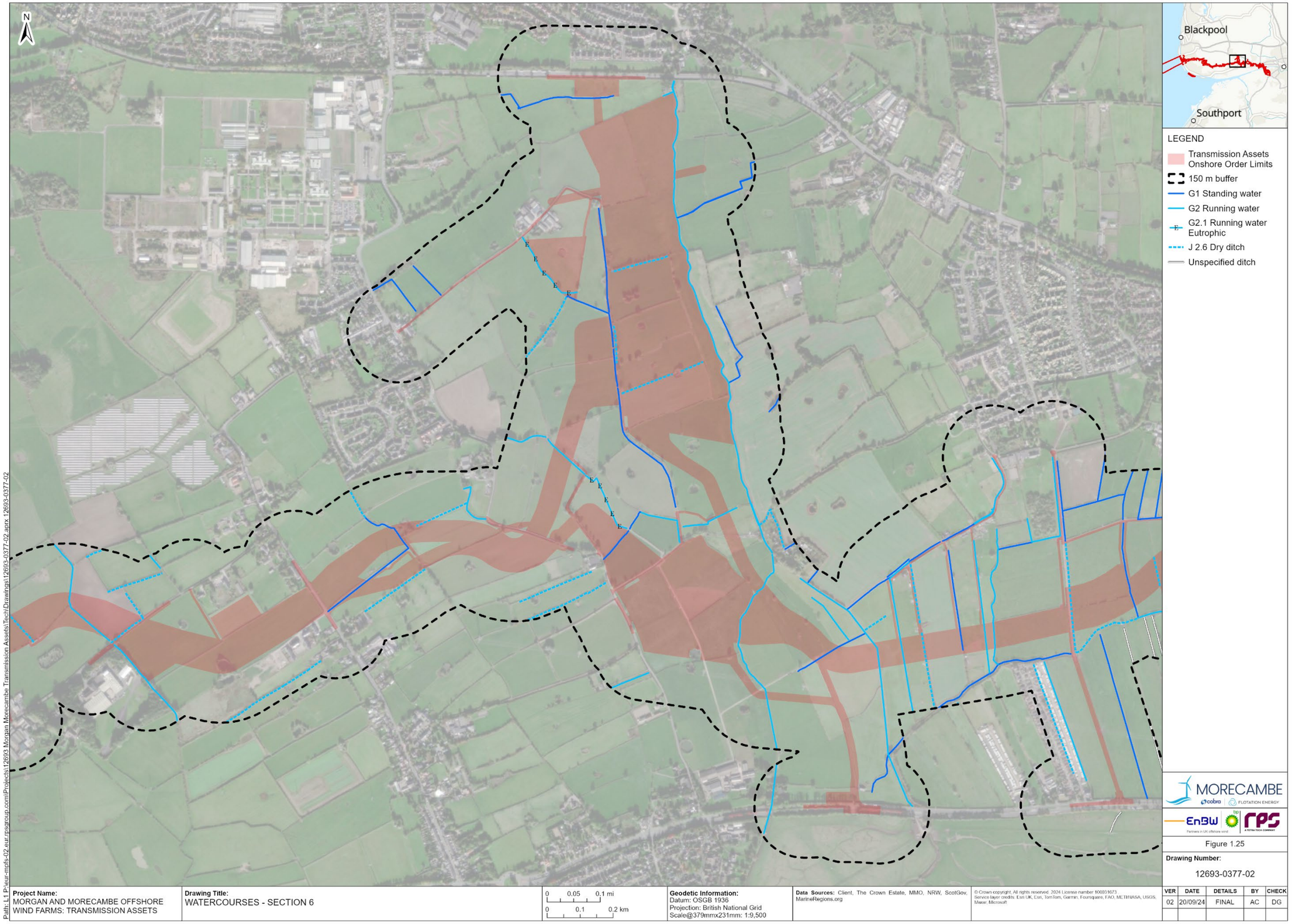

Figure 1.26: Watercourses – Section 6

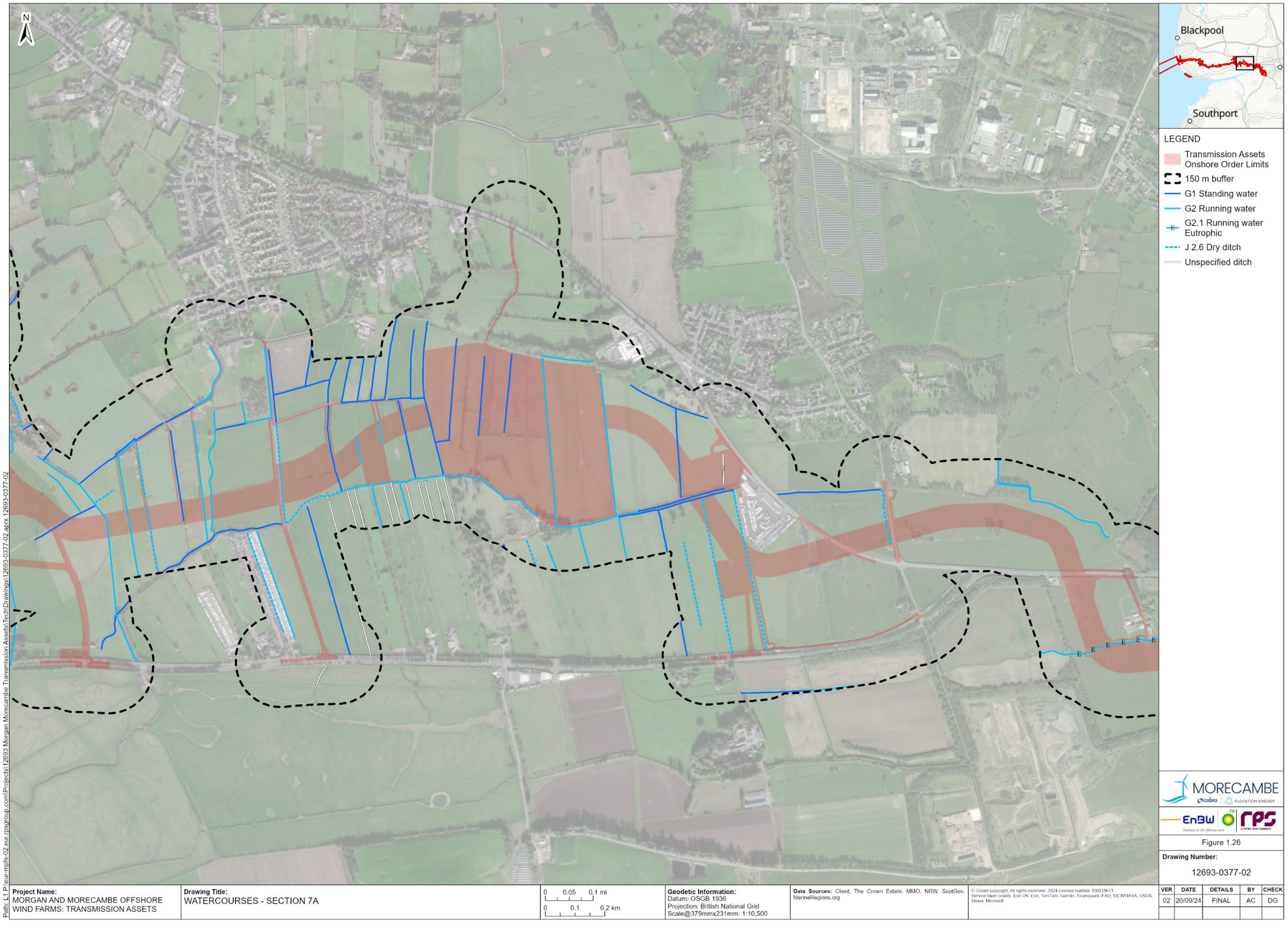

Figure 1.27: Watercourses – Section 7a

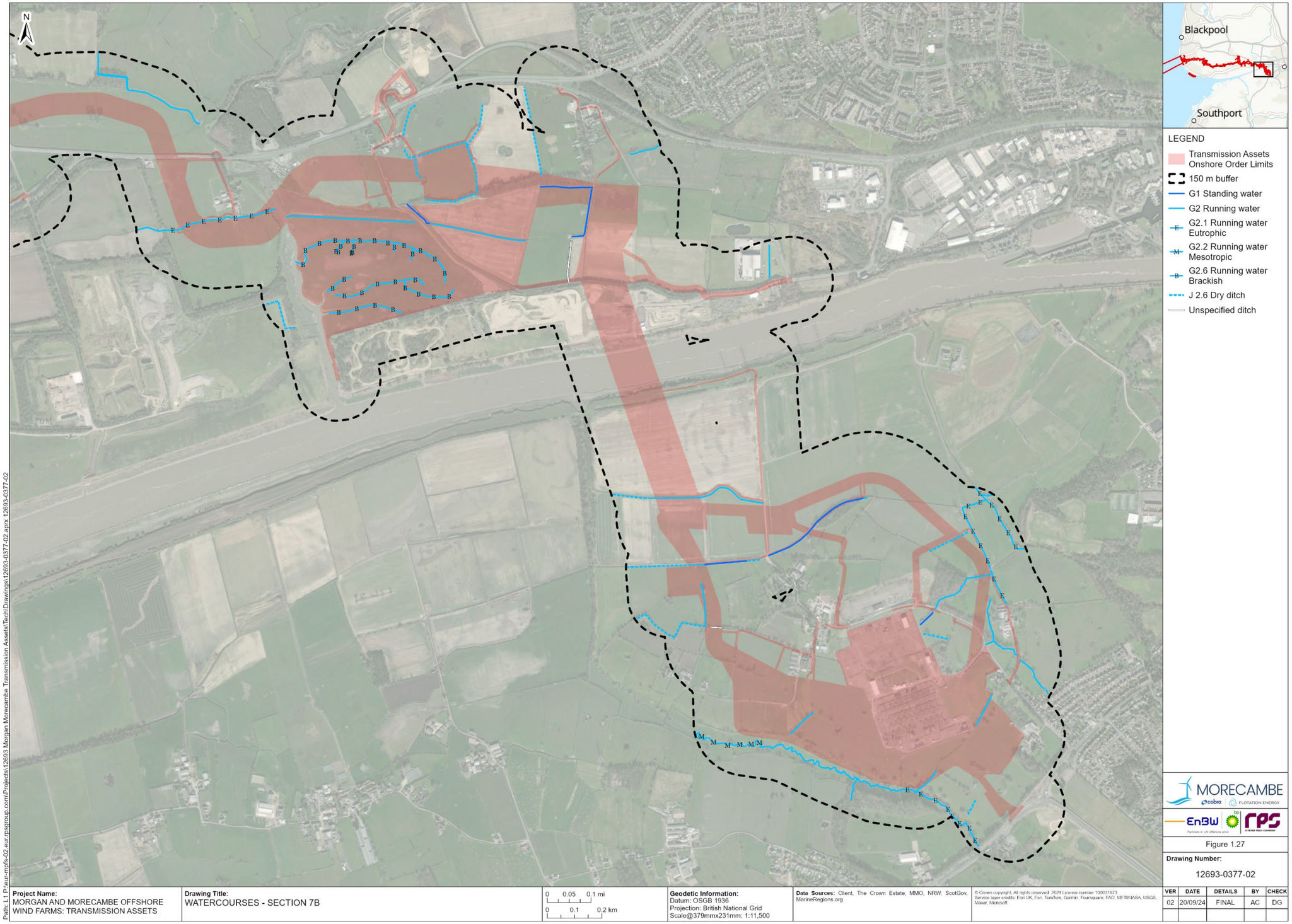

Figure 1.28: Watercourses – Section 7b

Table 1.8: Watercourse lengths identified within the survey area

Watercourse type	Section 1 (km)	Section 2 (km)	Section 3 (km)	Section 4 (km)	Section 5 (km)	Section 6 (km)	Section 7a (km)	Section 7b (km)	Grand Total (Onshore Order Limits) (km)	Grand Total (Onshore Order Limit) (%)	150 m buffer (km)	Grand Total (survey area) (km)	Grand Total (survey area) (%)
G1 - standing water	0.281	0.118	0.000	0.000	0.080	0.000	0.000	0.000	0.479	1.31	16.402	16.881	18.42
G1.1 - standing water - eutrophic	0.000	0.102	0.000	0.408	0.310	1.301	1.488	1.389	4.998	13.72	1.021	6.018	6.57
J2.6 - Dry ditch	1.503	1.734	1.608	0.935	1.588	3.204	4.040	3.784	18.396	50.51	11.205	29.601	32.30
Unspecified ditch	0.531	0.354	1.121	0.260	0.000	1.067	1.517	0.658	5.507	15.12	3.783	9.290	10.14
G2 - Running water	0.469	0.906	0.247	0.165	0.200	0.271	0.000	0.206	2.464	6.77	13.852	16.316	17.80
G2.1 - Running water - eutrophic	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	7.438	7.438	8.12
G2.2 - Running water - mesotrophic	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.725	0.725	1.99	0.361	1.087	1.19
G2.6 - Running water - brackish	0.222	0.134	0.240	0.000	0.999	0.565	0.933	0.757	3.850	10.57	1.169	5.019	5.48
Total	**3.007**	**3.349**	**3.216**	**1.768**	**3.177**	**6.408**	**7.977**	**7.520**	**36.420**	**100.00**	**55.230**	**91.650**	**100.00**

NVC

1.3.2.9 Surveys were scoped in for five sites within the survey area. Sites were scoped in for NVC survey due to the species richness and abundance and likely higher potential conservation concern of these habitats identified, or were requested to following consultation comments. Surveys revealed that two out of the five sites did not conform with an NVC community, and that phase 1 habitat survey was sufficient to define habitat type. Consequently, detailed NVC surveys were not conducted for sites 3 and 4.

1.3.2.10 Sites 1 and 2 were found to most closely conform with the W8 and W8e woodland community.

1.3.2.11 The location of four NVC sites (1 to 4) are presented in **Figure 1.29** to **Figure 1.31**. The full results of the NVC surveys at each site are set out in **Table 1.9** below, including their respective plant communities, based on analysis using MAVIS, where such analysis was undertaken. Descriptions of each site are provided in **paragraphs 1.3.2.14** to **1.3.2.22** below.

1.3.2.12 For the two sites where full NVC assessment was undertaken, the full species list and other survey information is provided in **Appendix B**.

1.3.2.13 Results of the NVC survey at Fylde sand dunes, including a comparison to the results published in Skelcher (2016) and details of the respective plant communities (based on MAVIS analysis), is provided in **paragraphs 1.3.2.23 to 1.3.2.34** below. The full species list and other survey information is provided in **Appendix C**.

Project Name:	Drawing Title:	Geodetic Information:	Data Sources:	© Crown copyright. All rights reserved. 2024. License number 100031673. Service layer credits: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Maxar, Microsoft
MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	VEGETATION COMMUNITIES - SITE 1 AND 2	Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:5,000	Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org	

VER	DATE	DETAILS	BY	CHECK
07	20/09/24	FINAL	AC	AW

Figure 1.28

Drawing Number:
12693-0257-07

Figure 1.29: Vegetation communities – Site 1 and 2

Figure 1.30: Vegetation communities – Site 4

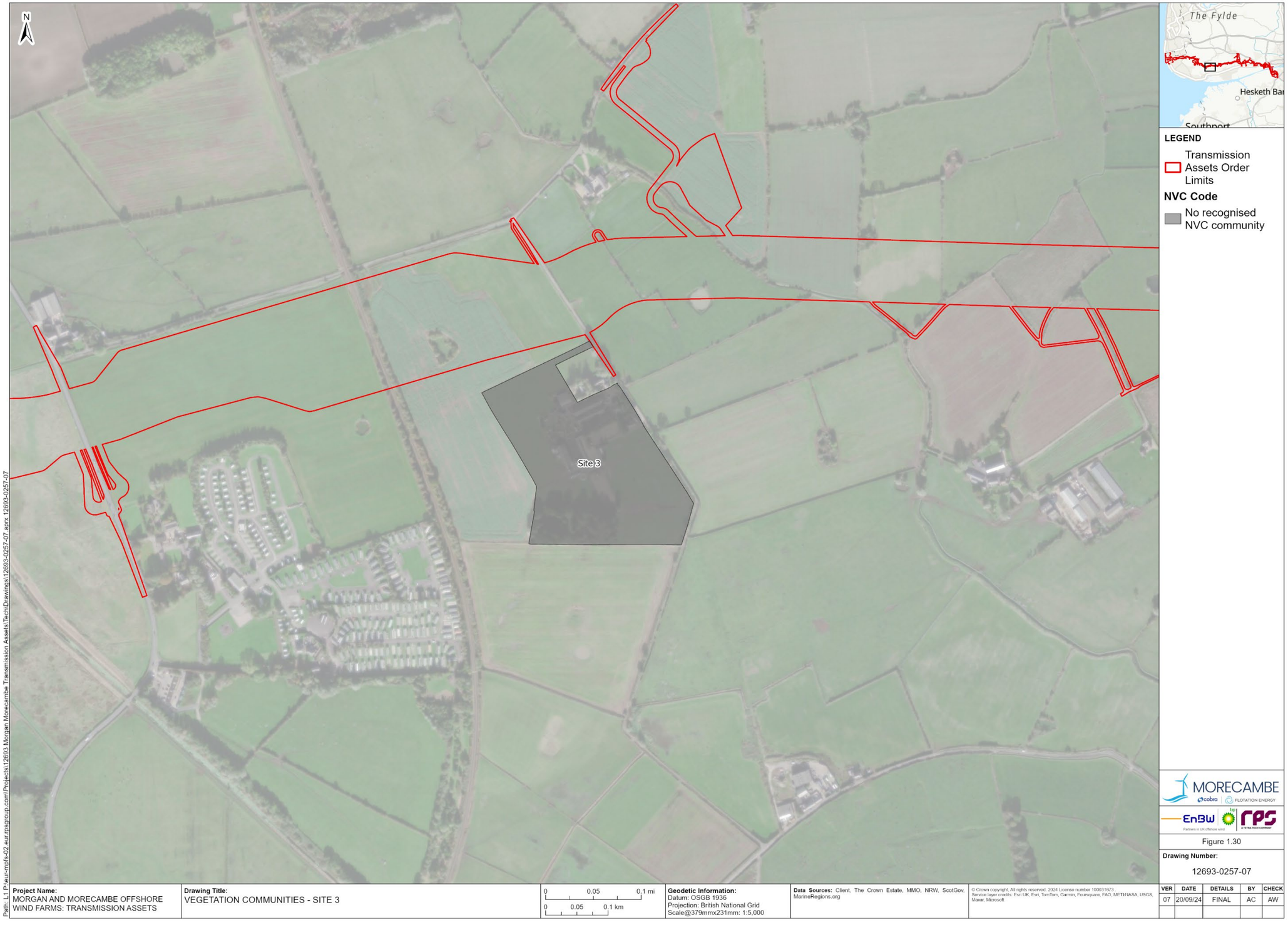

Figure 1.31: Vegetation communities - site 3

Table 1.9: NVC survey results

NVC community code	NVC sub-community type	Sites where NVC community type was present
W8	N/A – most closely resembles the W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland community, low abundance and scattered instances of species make it impossible to assign a clear subcommunity.	1
W8e	*Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community	2
No recognised NVC community in surveyed parcel	N/A to NVC survey, NVC analysis not required.	3 and 4 – NVC community not present

Site 1 – W8

1.3.2.14 Site 1 is southwest of the National Grid Penwortham Substation, but outside the Transmission Assets Order Limits. Site 1 most closely resembled a W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland community. The site comprised of a woodland block, a small part of which was accessible to grazing livestock. Canopy species included dominant sycamore *Acer pseudoplatanus*, turkey oak *Quercus cerris*, abundant species included ash *Fraxinus excelsior*, Hybrid black poplar *Populus x canadensis* and occasional species included beech *Fagus sylvatica*, downy birch *Betula pubescens*, English oak *Quercus robur* and bird cherry *Prunus padus*.

1.3.2.15 Site 1's understory consisted of frequent elder *Sambucus nigra* and other occasional species in low abundance, including sycamore, hazel *Corylus avellana*, holly *Ilex aquifolium,* hawthorn *Crataegus monogyna,* yew *Taxus baccata, Turkey oak,* crab apple *Malus sylvestris,* sweet chestnut *Castanea sativa,* hornbeam *Carpinus betulus*, rowan *Sorbus aucuparia*, *Rhododendron ponticum*, silver birch, bird cherry and beech.

1.3.2.16 The ground layer in Site 1 consisted of a number of species including Yorkshire fog *Holcus lanatus,* wood dock *Rumex sanguineus,* bramble *Rubus fruticosus* agg., red campion *Silene dioica*, wood avens *Geum urbanum,* herb robert *Geranium robertianum,* Himalayan balsam, dandelion *Taraxacum officinale* agg. common nettle *Urtica dioica,* common hogweed *Heracleum sphondylium,* wood millet *Milium effusum,* fringed willowherb *Epilobium ciliatum,* remote sedge *Carex remota,* cleavers *Galium aparine*, false oat grass *Arrhenatherum elatius,* ivy *Hedera helix,* hybrid bluebell *Hyacinthoides × massartiana,* bittersweet *Solanum dulcamara,* common honeysuckle *Lonicera periclymenum,* cocksfoot *Dactylis glomerata*, ground ivy *Glechoma hederacea*, cow parsley *Anthriscus sylvestris* and hawthorn saplings.

1.3.2.17 The ground flora of site 1 was dominated by bramble and red campion, frequent species included wood millet, remote sedge and ivy, and all other species rarely occurred.

Site 2 – W8e

1.3.2.18 Site 2 is mostly outside the Transmission Assets Order Limits and is present northeast of the National Grid, Penwortham Substation. Site 2 most closely resembled the W8e - *Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland, Geranium robertianum sub-community* woodland. The site comprised of a woodland block. Canopy species included dominant beech, frequent lime *Tilia x europaea,* sycamore, occasional bird cherry and rare pedunculate oak *Quercus robur*, white willow *Salix alba,* ash and sweet chestnut.

1.3.2.19 Site 2's understory consisted of frequent English elm *Ulmus procera and* hazel, occasional lime, wych elm *Ulmus glabra*, rare hawthorn, holly, pedunculate oak, English oak, beech, bird cherry, rowan, sycamore, *Rhododendron ponticum*, elder, ash and field maple.

1.3.2.20 The ground flora layer included a range of species including wood millet, ivy, wood avens, ash saplings, herb Robert, lords and ladies *Arum maculatum,* bramble, dog's mercury, wood dock, ground ivy, hedge mustard *Alliaria petiolata,* beech, hawthorn and ash saplings, wych elm, hybrid bluebell, red campion and wall lettuce.

1.3.2.21 Out of the ground flora species those most abundant included bramble, wood millet and ivy whilst all other species rarely occurred.

Sites 3 and 4

1.3.2.22 There were no recognised NVC communities for site 3 or site 4. It was deemed that phase 1 survey provided enough detail as these sites did not conform with an NVC community.

Fylde sand dunes

1.3.2.23 As set out in **paragraph 1.2.2.20**, surveys were undertaken between 13 and 16 August 2024 to identify whether the NVC surveys for the wetland communities at the sand dunes at landfall in 2016 still accurately reflected the ecological baseline.

1.3.2.24 Five NVC communities were identified – the dune slack communities SD17, SD16, SD15, and drier dune grassland/grassland communities SD9 and MG1. These are summarised in **paragraphs 1.3.2.25 to 1.3.2.32** below.

SD17 *Potentilla anserina* – *Carex nigra* dune slack community

1.3.2.25 This community is typified by abundant creeping bent *Agrostis stolinifera*, silverweed Potentilla anserina and common sedge *Carex nigra*. Also frequent are red fescue *Festuca rubra* and Yorkshire fog *Holcus lanatus*. In addition the bryophyte *Calliergonella cuspidatum* is locally abundant within this community.

SD16 *Salix repens – Holcus lanatus* dune-slack community

1.3.2.26 This community is typified by dominant creeping willow *Salix repens*, with high frequencies of both Yorkshire fog *Holcus lanatus* and red fescue *Festuca rubra*. Occasional species within this community are *Agrostis stolinifera* and *Poa pratensis*.

1.3.2.27 *Rubus – caesius* was identified as the sub-community. This fits well following floristic analysis as *Rubus-caesius* is present throughout, being present in 20 out of 21 quadrats.

SD15 *Salix repens – Calliergon cuspidatum* dune-slack community

1.3.2.28 This community is typified by a high frequency of creeping willow *Salix repens,* marsh pennywort *Hydrocotyle vulgaris*, water mint *Mentha aquatica* and *Calliergonella cuspidatum*. Also frequent are marsh bedstraw *Galium palustre*, marsh willowherb *Epilobium palustre*, marsh horsetail *Equisetum palustre* and greater bird's-foot trefoil *Lotus pedunculatus.*

1.3.2.29 In addition, The area defined by Skelcher (2016) as Iris dominated dune mire/dune slack is clearly present. Three quadrats were taken and although distinctly different from the above defined SD15 community, the best fit is still SD15a.

1.3.2.30 An area previously defined as S12 – *Typha latifolia* swamp by Skelcher (2016) was also sampled. The results from this area has a best fit to SD15. However, it is worth noting that further into the centre of the Typha area (as defined by Skelcher (2016)), the species diversity may very well decrease and move towards a more homogenous stand. The Typha area is then probably best defined as a sliding scale between SD15 and S12.

SD9 *Ammophila arenaria-Arrhenatherum elatius* dune grassland

1.3.2.31 This community is typified by the presence of co-dominant false oat-grass *Arrhenatherum elatius* with red fescue *Festuca rubra* and marram grass *Ammophila arenaria*. These quadrats were all within areas previously identified as SD16 in Skelcher (2016).

MG1 *Arrhenatherum elatius* grassland

1.3.2.32 This community is typified by presence of coarse grasses such as false oat-grass *Arrhenatherum elatius* alongside cock's foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*. These quadrats were all within areas previously identified as SD16 in Skelcher (2016).

Comparison to Skelcher (2016)

1.3.2.33 The survey confirmed that the 2016 survey reported a broadly accurate representation of the current wetland ecological communities present. The key differences are as follows.

- Areas on top or on the side of sand dunes where surveyed are not SD16 but rather mainly SD9. This correlates well with the fact that dune slacks are not known to occur on these high elevations.
- From extensive walkover surveys and a number of quadrats taken, even areas that were previously defined as SD16 at lower elevations did not always fit this community due to a lack of associated species, despite *Salix repens* being the dominant species in this area.
- There was found to be an increase in SD15 communities. These were located within previously defined SD16 areas.
- There was a small increase in the areas defined as SD16 dune slack in the Ribble Estuary SSSI.
- SD15 communities and SD16 communities were not found to occur above an elevation of 7 m.
- The Iris and Typha dominated dune slacks located in the south seem to have grown in size. However, since these fall within the SD15 community the overall affect is the SD15 area is largely the same here.

1.3.2.34 In relation to the moisture sensitive areas of the dune complex, the dune slacks were found to have the same National Vegetation Classification as outlined in the 2016 report. Dune slacks depend on a high groundwater table, which makes them very sensitive to water level changes. Any reduction in groundwater can dry them out, leading to significant changes in their ecological balance. For example, as the water table drops and slacks become drier, moisture-loving species typical of SD15 communities such as *Calliergon cuspidatum, Carex nigra,* and *Mentha aquatica* decline. *Salix repens* may persist but become more scattered, as it can tolerate slightly drier conditions. SD16 is associated with slightly drier, but still moist, dune slacks and is transitional between wetter slack types like SD15 and drier dune grasslands (SD9, SD8 and SD7). These communities exist throughout the dune complex.

1.4 Summary

1.4.1 Overview

1.4.1.1 This technical report presents the results of the phase 1 habitat, national vegetation classification and hedgerow survey desk study and the field surveys undertaken to inform Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.

1.4.2 Phase 1 summary

1.4.2.1 Phase 1 habitat surveys were undertaken between May 2022 and July 2024 to map broad habitat types present and identify potential for protected or notable species within the phase 1 habitat survey area. All broad habitat types recorded within the phase 1 habitat survey area were mapped using the JNCC phase 1 habitat classification scheme, including phase 1 habitat types (JNCC, 2010).

1.4.2.2 Habitats present within the Onshore Order Limits predominantly comprised the following habitats.

- B4 improved grassland (199.325 ha, 36.16%);
- B6 poor semi-improved grassland (116.994 ha, 21.21%); and
- J1.1 arable (78.623 ha, 14.26%).

1.4.2.3 Together these three habitat types comprise nearly 72% of habitats within the Onshore Order Limits.

1.4.2.4 A range of other habitat types within the Onshore Order Limits were recorded, including the following.

- HS hard standing and J3.6 buildings (combined 30.511 ha, 5.53%);
- H2 saltmarsh (22.254 ha, 4.04%, present in Section 7b - Lea Marsh);
- J1.2 amenity grassland (26.26 ha, 2.7%);
- H6 sand dune (12.036 ha, 2.18%, present in Section 1 at the west end of the survey area);
- B2.2 semi-improved neutral grassland (10.999 ha, 2%, mostly in Section 2); and
- J1.2 Amenity grassland (10.488 ha, 1.90%, mostly in Section 1).

1.4.2.5 All other habitats within the Onshore Order Limits are present in areas of less than 10 ha (1.65% or below).

1.4.2.6 Sand dunes are present at Section 1 but not in any other section within the Onshore Order Limits.

1.4.2.7 Watercourses and ditches were present throughout, including streams, standing and running water and wet and dry ditches. Over 18 km of dry ditches were present, along with 5.5 km of unspecified ditches and 5.5 km of wet ditches (combined totals for G1 standing water and G1.1 standing eutrophic water). Approximately 7 km of running water (combined totals for G2.6 running water (brackish), G2 running water and G2.1 running water (eutrophic)) was recorded within the survey area.

1.4.3 Hedgerow summary

1.4.3.1 Over 28 km of hedgerows were mapped within the Transmission Assets Order Limits, the majority of which (18 km, 63.7%) comprised J2.1.2 intact species-poor native hedgerows. Other hedge types present included:

- J2.2.2 Defunct species-poor native hedgerows (3.17 km, 11.2%);
- J2.3.2 Intact species-poor hedgerows with trees (2.47 km, 9.7%); and
- J2.1.1 Intact species-rich native hedgerows (1.63 km, 5.7%).

1.4.3.2 Of the total of 28 km of hedgerow recorded in the Onshore Order Limits, 1.46 km were assessed as being ‘important’ hedgerows as defined by the Hedgerow Regulations. Important hedgerows were recorded in Sections 7b (0.70 km), 5 (0.42 km), 6 (0.28 km) and 4 (0.06 km).

1.4.3.3 A further 4.8 km of 'important' hedgerows were mapped outside of the Onshore Order Limits, but inside the survey area (the 150 m buffer).

1.4.4 NVC summary

1.4.4.1 Two areas of habitat were assessed to NVC community level, and these were identified as woodland communities W8 and W8e. Details of the species recorded can be found in **Appendix B**.

1.4.4.2 The NVC survey undertaken at the sand dune habitats at landfall confirmed that the 2016 survey reported an accurate representation of the current wetland botanical communities present within the dune slacks. The same NVC communities were found in moisture-sensitive areas of the dune complex. Dune slacks depend on a high groundwater table, which makes them very sensitive to water level changes, and multiple dune slack communities were found during surveys (SD17, SD16 and SD15).

1.5 References

Atherton, I., Bosanquet, S. and Lawley, M (2010). Mosses and Liverworts of Britain and Ireland: a field guide. British Bryological Society.

JNCC (2010) Handbook for Phase 1 Habitat survey - a technique for environmental audit. Available at: https://jncc.gov.uk/. Accessed: January 2024.

Rodwell, J S (ed.) (1991a). British Plant Communities, Vol. 1: woodlands and scrub. Cambridge University Press, Cambridge.

Rodwell, J S (ed.) (1991b). British Plant Communities, Vol. 2: mires and heaths. Cambridge University Press, Cambridge.

Rodwell, J S (ed.) (1992). British Plant Communities, Vol. 3: grasslands and montane communities. Cambridge University Press, Cambridge.

Rodwell, J S (ed.) (1995). British Plant Communities, Vol. 4: aquatic communities, swamps and tall-herb fens. Cambridge University Press, Cambridge.

Rodwell, J S (ed.) (2000). British Plant Communities, Vol. 5: maritime communities and vegetation of open habitats. Cambridge University Press, Cambridge.

Rodwell, J S (2006). National Vegetation Classification: Users' handbook. JNCC

Rose, F. and O'Reilly, C. (2006). The Wild Flower Key, Revised and expanded edition. Penguin Books, London.

Rose, F. (1989). Colour Identification Guide to the grasses, sedges, rushes and ferns of the British Isles and north-western Europe. Penguin Books, London.

Stace, C (ed.) (2019). New Flora of the British Isles. Cambridge University Press, Cambridge.

Skelcher, G. (2016). A vegetation survey of the Fylde Sand Dunes and Saltmarshes 2016. Report for the Fylde Sand Dune Steering Group. G Skelcher, Carnforth.

Appendix A: Target Notes - INNS

Target note ID	Section	INNS Species
1	Section 1	Monbretia *Montbretia crocosmia x crocosmiiflora* recorded on bank
2	Section 1	Japanese Rose *Rosa rugosa*
3	Section 1	Stand of Japanese rose approx. 30m in length encroaching from adjacent land
4	Section 2	Himalayan Balsam *Impatiens glandulifera*
5	Section 3	Rhododendron *Rhododendron ponticum* bush within private garden
6	Section 6	Moderate amount of Himalayan balsam present in wet ditch
7	Section 6	Himalayan balsam present throughout drain
8	Section 6	Himalayan balsam present throughout drain
9	Section 6	Himalayan balsam present throughout drain
10	Section 6	Himalayan balsam present throughout drain
11	Section 7a	Japanese rose
12	Section 7a	Japanese rose
13	Section 7a	Japanese rose
14	Section 7b	Large area of Himalayan balsam approximately 50m long and 10m at its widest point, coinciding with area of evident tree thinning.
15	Section 7b	Abundant Himalayan balsam along wet ditch and track verge
16	Section 7b	3m x 3m stand of Japanese rose.
17	Section 7b	Himalayan balsam
18	Section 7b	Himalayan balsam
19	Section 7b	Himalayan balsam present along entire length of watercourse.

Appendix B: NVC survey sheets

NVC survey Site 1				
Survey duration	3 hours			
Weather Conditions	Changeable. Warm			
Wind	0		**Air Temperature (°C)**	19
Rain	0		**Cloud Cover**	4
Broad habitat types present	Woodland			
Site and vegetation description (Include notes on management/habitat condition) and any site constraints				
Deciduous woodland. Trees of varying ages, from saplings to oaks over a metre in diameter. Several dead standing trees. Very difficult to distinguish between canopy and understorey.				

Quadrat Reference	**1**		**2**	
Quadrat Size ² (m x m)	50 x 50		50 x 50	
Co-ordinates	350462	428033	350359	350359
Aspect	Flat		North	
Slope (degrees)	0		4	
Canopy mean height (m) and cover (%)	14	90	14	95
Understorey mean height (m) and cover (%)	5	60	3	50
Ground flora mean height (cm) and cover (%)	30	50	20	70

Species List (Latin Name)	DOMIN VALUE		Frequency	Range
Canopy	**20x125**	**50x50**		
Tilia x europaea	4	4		
Fagus sylvatica	8	5	II	4 - 4
Acer pseudoplatanus	5	5	II	5 - 8
Quercus petraea	6	5	II	5 - 5

Species List (Latin Name)	DOMIN VALUE		Frequency	Range
Salix alba	1	0	II	5 - 6
Castanea sativa	1	0	I	1 - 1
Quercus robur	0	1	I	1 - 1
Prunus avium	0	4	I	1 - 1
Fraxinus excelsior	0	2	I	4 - 4
Understorey	**20x125**	**50x50**		
Ulmus procera	6		I	6 - 6
Tilia × europaea	6	4	II	4 - 6
Ulmus glabra	6		I	3 - 3
Crataegus monogyna	2	2	II	2 - 2
Ilex aquifolium	2		I	2 - 2
Quercus petraea	2		I	2 - 2
Fagus sylvatica		2	I	2 - 2
Prunus avium	2	4	II	2 - 4
Sorbus aucuparia	2	4	II	2 - 4
Acer pseudoplatanus	2	4	II	2 - 4
Rhododendron ponticum		5	I	5 - 5
Corylus avellana		5	I	5 - 5
Sambucus nigra		1	I	1 - 1
Fraxinus excelsior	1		I	1 - 1
Prunus spinosa	1		I	1 - 1
Acer campestre	1		I	1 - 1
Ground Flora	**4x4**	**4x4**		
Milium effusum	4	4	II	4 - 4
Hedera helix	4		I	4 - 4
Geum urbanum	1	1	II	1 - 1
Fraxinus excelsior (Juv)	1	2	II	1 - 2
Geranium robertianum	2	5	II	2 - 5

Species List (Latin Name)	DOMIN VALUE		Frequency	Range
Dactylis glomerata		1	I	1 - 1
Arum maculatum	1		I	1 - 1
Urtica dioica				
Rubus fruticosus	6	5	II	5 - 6
Heracleum sphondylium				
Mercurialis perennis	1	1	II	1 - 1
Rosa canina (Juv)				
Rumex sanguineus	1	1	II	1 - 1
Prunus avium (Juv)				
Taraxacum officinale				
Glechoma hederacea	1	1	II	1 - 1
Alliaria petiolata	1	1	II	1 - 1
Fagus sylvatica (Juv)	1		I	1 - 1
Quercus petraea (Juv)				
Ulmus glabra	1		I	1 - 1
Sorbus aucuparia				
Hyacinthoides x massartiana	1		I	1 - 1
Crataegus monogyna (Juv)	1		I	1 - 1
Fraxinus excelsior (Juv)	2	2	II	2 - 2
Lolium perenne		1	I	1 - 1
Silene dioica		1	I	1 - 1
Lactuca muralis		1	I	1 - 1

NVC survey site 2	
Survey duration	3 hours
Weather Conditions	warm, calm

NVC survey site 2						
Wind		0		**Air Temperature (°C)**	15	
Rain		0		**Cloud Cover**	4	
Broad habitat types present	Woodland					
Site and vegetation description (Include notes on management/habitat condition) and any site constraints						
Deciduous woodland. Dominated by *Populus x canadensis, Acer pseudoplatanus, Quercus cerris & Fagus sylvatica*.						
Quadrat Reference	**1**		**2**		**3**	
Quadrat Size ² (m x m)	50 x 50m		50 x 50m		50 x 50m	
Co-ordinates	349967	427283	350017	427400	350141	427357
Aspect	Flat		NW		Flat	
Slope (o)	0		6		0	
Canopy mean height (m) and cover (%)	12	85	14	80	14	75
Understorey mean height (m) and cover (%)	2	30	3	45	2.5	25
Ground flora mean height (cm) and cover (%)	20	50	0	0	0	

Species List (Latin Name)	DOMIN VALUE			Frequency	Range
Canopy	**50x50**	**50x50**	**50x50**		
Acer pseudoplatanus	4	8		III	
Fraxinus excelsior		1	7	II	4 - 8
Populus x canadensis		6	6	II	1 - 7
Fagus sylvatica		4	1	II	6 - 6

Species List (Latin Name)	DOMIN VALUE			Frequency	Range
Quercus cerris	9			II	1 - 4
Betula pubescens	4			I	9 - 9
Quercus robur		1		I	4 - 4
Prunus avium			2	I	1 - 1
				I	2 - 2
Understorey	**50x50**	**50x50**	**50x50**		
Sambucus nigra		4		III	
Acer pseudoplatanus	1	2	1	I	4 - 4
Corylus avellana	1	2	3	III	1 - 2
Salix caprea				III	1 - 3
Ilex aquifolium	1	1			
Crataegus monogyna	1	4	1	II	1 - 4
Taxus baccata		1		III	1 - 4
Quercus cerris	4			I	1 - 1
Malus sylvestris	1			I	4 - 4
Castanea sativa	3			I	1 - 1
Carpinus betulus	3			I	3 - 3
Sorbus aucuparia	1			I	3 - 3
Rhododendron ponticum	1	4		I	
Betula pubescens	1			II	
Fagus sylvatica		1	1	I	1 - 1
Prunus avium			1	II	
				I	1 - 1
Ground flora	**4x4**	**4x4**	**4x4**		

Species List (Latin Name)	DOMIN VALUE			Frequency	Range
Holcus lanatus	1		1	III	
Carex pendula				II	1 - 1
Rumex sanguineus		1	1		
Rubus fruticosus	5	5	7	II	1 - 1
Ranunculus repens				III	5 - 7
Silene dioica		3	4		
Geum urbanum		1	3	II	3 - 4
Geranium robertianum			3	II	1 - 3
Impatiens glandulifera		1		I	1 - 1
Taraxacum officinale				I	1 - 1
Urtica dioica			1		1 - 1
Plantago major				I	1 - 1
Heracleum sphondylium		1			
Milium effusum	5	4	4	I	1 - 1
Fraxinus excelsior (Juv)				III	4 - 5
Epilobium ciliatum		1			
Carex remota	4		1	I	1 - 1
Galium aparine			1	II	1 - 4
Circaea lutetiana				I	1 - 1
Salix cinerea (Juv)					
Arrhenatherum elatius			1		
Juncus effusus		5		I	1 - 1
Hedera helix		5	4		

Species List (Latin Name)	DOMIN VALUE			Frequency	Range
Tellima grandiflora				II	4 - 5
Hyacinthoides × massartiana	2	2			
Mercurialis perennis				II	2 - 2
Oxalis acetosella					
Asplenium scolopendrium					
Acer pseudoplatanus (Juvenile)		3			
Dryopteris filix-mas					
Salanum dulcamara	1				
Equisetum telmateia				I	1 - 1
Lonicera periclymenum	1				
Dactylis glomerata		1	1	I	1 - 1
Senecio jacobaea				II	1 - 1
Arum maculatum					
Glechoma hederacea			1		
Crataegus monogyna (Juv)			1	I	1 - 1
Anthriscus sylvestris			1	I	1 - 1

Appendix C: Fylde sand dunes NVC survey sheets

SD15 - Salix repens – Calliergon cuspidatum dune-slack community

Scientific Name	Common name	Quadrat												Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		
Hydrocotyle vulgaris	Marsh Pennywort	9	8	8	6	6	4	7	8	8	1	5	8	V	1 - 9
Salix repens	Creeping Willow	6	7	5	7	7	7	7	7	8	10	8	9	V	5 - 10
Agrostis stolonifera	Creeping Bent	7	5	4	6	6	2	5	3			1	3	V	1 - 7
Carex nigra	Common Sedge	7	8	4	9	8	8	7	3	1		9		IV	1 - 9
Rubus caesius	Dewberry		1		1	1	1	2	7	2	3	3	2	IV	1 - 7
Equisetum palustre	Marsh Horsetail	8		5	1		1				2	2		IV	1 - 8
Calliergonella cuspidata	Pointed Spear Moss	9	7	5		2	6	1	1			1		III	1 - 9
Epilobium palustre	Marsh Willowherb	2	1	2	2					1		1		III	1 - 2
Juncus articulatus	Jointed Rush	6	2			1								III	1 - 6
Plantago lanceolata	Ribwort Plantain					6	3	1	2					III	1 - 6
Carex flacca	Glaucous sedge						1	2	3				1	II	1 - 3
Danthonia decumbens	Heath grass						1							II	1 - 1
Eleocharis palustris	Common Spike-rush			1										II	1 - 1
Eriophorum	Eriophorum	2	1	2										II	1 - 2
Galium aparine	Cleavers				1						1			II	1 - 1
Holcus lanatus	Yorkshire Fog					2	1	1						II	1 - 2
Kindbergia praelonga	Common Feather-moss					1				4	7			II	1 - 7
Lotus corniculatus	Bird's-foot trefoil					1		3	1					II	1 - 3
Mentha aquatica	Water Mint	2		5				6		1	1	1		II	1 - 6
Myosotis	Forget me Not	1	1											II	1 - 1
Poa pratensis	Smooth Meadow-grass						1							II	1 - 1

Scientific Name	Common name	Quadrat												Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		
Ranunculus acris	Meadow Buttercup					1		1						II	1 - 1
Vicia cracca	Tufted Vetch				1					8		3	2	II	1 - 8
Carex arenaria	Sand Sedge			1									3	I	1 - 3
Equisetum	Horsetail					1								I	1 - 1
Equisetum fluviatile	Water Horsetail		4											I	4 - 4
Filipendula ulmaria	Meadowsweet						1					1		I	1 - 1
Juncus compressus	Round-fruited Rush						1							I	1 - 1
Juncus conglomeratus	Compact Rush						1				1			I	1 - 1
Juncus inflexus	Hard Rush			6						8				I	6 - 8
Lathyrus pratensis	Bird's-foot trefoil				1					2	1	2		I	1 - 2
Molinia caerulea	Purple Moor Grass					1								I	1 - 1
Potentilla reptans	Creeping cinquefoil						8							I	8 - 8
Ranunculus flammula	Lesser Spearwort	1												I	1 - 1
Centaurea nigra	Common Knapweed							1						I	1 - 1
Equisetum arvense	Field Horetail							1		1	1			I	1 - 1
Epipactis palustris	Marsh Helleborine							2						I	2 - 2
Arrhenatherum elatius	False Oat grass									2	3			I	2 - 3
Heracleum sphondylium	Hogweed										1			I	1 - 1
Solanum dulcamara	Bittersweet										1			I	1 - 1
Elytrigia repens	Common couch										1			I	1 - 1
Calystegia silvatica	Large Bindweed											4		I	4 - 4
Myosotis laxa	Tufted Forget-me-not											2		I	2 - 2
Cirsium arvense	Creeping Thistle											1		I	1 - 1

Scientific Name	Common name	Quadrat												Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		
Persicaria amphibia	Amphibious Bistort											1		I	1 - 1
Carex nigra	Common Sedge												6	I	6 - 6
Dactylis glomerata	Cocksfoot												1	I	1 - 1

SD 16 - *Salix repens – Holcus lanatus* dune-slack community

Scientific Name	Common name	Quadrat																				Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	
Salix repens	Creeping Willow	5	9	7	6	6	5	6	8	7	8	8	7	9	4	6	6	7	7	2	6	6	V	2 - 9
Holcus lanatus	Yorkshire Fog	4	1	3	2	8	7	2	6	2	4		3	2	4	2	2	2	2	4	6	2	V	1 - 8
Rubus caesius	Dewberry	2	2	4	6	3		6	6	4	5	4	4	6	4	8	7	2	6	2	5	5	V	2 - 8
Festuca rubra	Red fescue	8	7	7	6	5	3	3	4	2	3	1	1	4	8	5	3	4	4	4	5	6	V	1 - 8
Arrhenatherum elatius	False Oat-grass	4	4	7	8	2		2	1	7		3	2				6	2				6	IV	1 - 8
Equisetum arvense	Field horsetail		4	5	2	1			2						1	6	1			1	6	8	IV	1 - 8
Hydrocotyle vulgaris	Marsh Pennywort	4		8	8	8	4	7	6	7	1	6	9	6				5	7		7		IV	1 - 9
Plantago lanceolata	Ribwort Plantain	5	5		1	1	3	3	2	1	5	1		5		4	1	2		2		1	IV	1 - 5
Agrostis stolonifera	Creeping Bent	4			2	3	2	8				2		2			4	3	1	2			III	1 - 8
Carex flacca	Glaucous sedge	9	1	3	6			2	2	2	5			4				3	4	2	1		III	1 - 9
Dactylis glomerata	Cocksfoot	4	4			2	1			3					3	3	5	2		1	1		III	1 - 5

Scientific Name	Common name	Quadrat																				Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	
Lathyrus pratensis	Meadow Vetchling	4	6	8				1		2		8								2	1		III	1 - 8
Lotus corniculatus	Bird's-foot trefoil	1	1	2	2	1	1	2	3		4	2	2	1					1	1	1		III	1 - 4
Poa pratensis	Smooth meadow grass			1		1	1		1				1	1	1	3		2	3	2	2		III	1 - 3
Anthoxanthum odoratum	Sweet vernal-grass	2	1			3	2	1												4	2		II	1 - 4
Carex nigra	Common Sedge	3			1	3			3					3				2	1				II	1 - 3
Cirsium arvense	Creeping thistle											1			2	1	1			1	1	1	II	1 - 2
Kindbergia praelonga	Common feather-moss			2	2	2				2				2									II	2 - 2
Mentha aquatica	Water mint			2					6									1					II	1 - 6
Ononis spinosa	Spiny restharrow		1			1									2	3		1				1	II	1 - 3
Rhinanthus minor	Yellow rattle	4		4		2	1								3		1			4			II	1 - 4
Agrimonia eupatoria	Agrimony	1						1	2														I	1 - 2
Angelica sylvestris	Wild Angelica																	5					I	5 - 5
Anthriscus caucalis	Anthriscus caucalis															1							I	1 - 1
Aster x salignus	Common Michaelmas Daisy						2													1			I	1 - 2

Scientific Name	Common name	Quadrat																				Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	
Brachythecium rutabulum	Rough-stalked Feather-moss											2	7										I	2 - 7
Calliergonella cuspidata	Pointed Spear-moss							1	2				1	5									I	1 - 5
Campanula	Bell flower		1																				I	1 - 1
Cardamine pratensis	Cuckoo flower					1																	I	1 - 1
Carex arenaria	Sand sedge																		1		2		I	1 - 2
Cerastium fontanum	Common Mouse-ear								1														I	1 - 1
Crataegus monogyna	Common hawthorn									4													I	4 - 4
Dactylorhiza	Marsh Orchid Species																			1			I	1 - 1
Daucus carota	Wild Carrot														1	4							I	1 - 4
Epipactis palustris	Marsh Helleborine							1	3					1									I	1 - 3
Filipendula ulmaria	Meadowsweet					1																	I	1 - 1
Galium aparine	Cleavers													4									I	4 - 4
Heracleum sphondylium	Hogweed			1																			I	1 - 1
Hippophae rhamnoides	Sea Buckthorn																			1			I	1 - 1
Jacobaea vulgaris	Common ragwort														1						1		I	1 - 1

Scientific Name	Common name	Quadrat																				Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	
Juncus articulatus	Jointed Rush							1						1									I	1 - 1
Lotus pedunculatus	Greater bird's-foot-trefoil						5																I	5 - 5
Luzula campestris	Field Wood-rush				1																		I	1 - 1
Molinia caerulea	Purple Moor Grass					4																	I	4 - 4
Phleum pratense	Timothy									1													I	1 - 1
Hieracium sp.	Hawkweed		1																				I	1 - 1
Potentilla anserina	Silverweed														5		3		2	1			I	1 - 5
Potentilla reptans	Creeping cinquefoil						1		5										1				I	1 - 5
Ranunculus acris	Meadow buttercup	1			1	1	1							1									I	1 - 1
Ranunculus bulbosus	Bulbous buttercup																	1				1	I	1 - 1
Solidago canadensis	Goldenrod																			7			I	7 - 7
Taraxacum agg.	Dandelion				1																		I	1 - 1
Trifolium pratense	Red Clover				1		7																I	1 - 7
Trifolium repens	White Clover							1															I	1 - 1
Vicia cracca	Tufted Vetch									2		2		2							5	6	I	2 - 6

Scientific Name	Common name	Quadrat																				Constancy	Range
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	
Danthonia decumbens	Heath grass													3									I	3 - 3

SD17 *Pontentilla* dune slack community

Scientific Name	Common name	Quadrat	Constancy	Range
		Q1		
Festuca rubra	Red Fescue	9	V	9 - 9
Potentilla anserina	Silverweed	8	V	8 - 8
Elymus repens	Common couch	7	V	7 - 7
Vicia cracca	Tufted Vetch	4	V	4 - 4
Agrostis stolonifera	Creeping Bent	2	V	2 - 2
Typha latifolia	Bulrush	2	V	2 - 2
Juncus inflexus	Hard Rush	2	V	2 - 2
Alopecurus pratensis	Meadow foxtail	1	V	1 - 1
Epilobium palustre	Marsh Willowherb	1	V	1 - 1
Lathyrus pratensis	Meadow Vetchling	1	V	1 - 1
Salix repens	Creeping Willow	1	V	1 - 1
Galium	Galium	1	V	1 - 1
Equisetum fluviatile	Water Horsetail	1	V	1 - 1
Persicaria amphibia	Amphibious Bistort	1	V	1 - 1
Equisetum arvense	Field horsetail	1	V	1 - 1

SD15 Iris community

Scientific Name	Common name	Quadrat			Constancy	Range
		Q1	Q2	Q3		
Iris pseudacorus	Yellow Iris	9	8	9	III	8 - 9
Carex nigra	Common Sedge	6	8	1	III	1 - 8
Salix repens	Creeping Willow	1	1	1	III	1 - 1
Vicia cracca	Tufted Vetch	4	2	3	III	2 - 4
Calliergonella cuspidata	Pointed Spear-moss	5	1		II	1 - 5
Equisetum palustre	Marsh Horsetail		1	2	II	1 - 2
Galium	Galium	1		1	II	1 - 1
Hydrocotyle vulgaris	Marsh pennywort	6		4	II	4 - 6
Rumex crispus	Curly dock		1	1	II	1 - 1
Mentha aquatica	Water Mint	2			I	2 - 2
Agrostis stolonifera	Creeping Bent			3	I	3 - 3
Arrhenatherum elatius	False Oat-grass			2	I	2 - 2
Carex hirta	Hairy Sedge			1	I	1 - 1
Cirsium arvense	Creeping Thistle			1	I	1 - 1
Epilobium palustre	Marsh Willowherb	1			I	1 - 1
Festuca rubra	Red Fescue			4	I	4 - 4
Filipendula ulmaria	Meadowsweet		1		I	1 - 1
Hypericum maculatum	Imperforate St John's-wort			1	I	1 - 1
Lathyrus pratensis	Meadow Vetchling			2	I	2 - 2
Myosotis	Forget-me-not	1			I	1 - 1
Potentilla reptans	Creeping cinquefoil			1	I	1 - 1
Ranunculus flammula	Lesser spearwort		1		I	1 - 1
Ranunculus repens	Creeping Buttercup			1	I	1 - 1

Scientific Name	Common name	Quadrat			Constancy	Range
		Q1	Q2	Q3		
Rhinanthus minor	Yellow rattle			1	I	1 - 1
Rubus caesius	Dewberry			1	I	1 - 1
Solanum dulcamara	Bittersweet		2		I	2 - 2

SD9 Dune grassland community

Scientific Name		Quadrat			Constancy	Range
		Q1	Q2	Q3		
Iris pseudacorus	Yellow Iris	9	8	9	III	8 - 9
Carex nigra	Common Sedge	6	8	1	III	1 - 8
Salix repens	Creeping Willow	1	1	1	III	1 - 1
Vicia cracca	Tufted Vetch	4	2	3	III	2 - 4
Calliergonella cuspidata	Pointed Spear-moss	5	1		II	1 - 5
Equisetum palustre	Marsh Horsetail		1	2	II	1 - 2
Galium	Galium	1		1	II	1 - 1
Hydrocotyle vulgaris	Marsh pennywort	6		4	II	4 - 6
Rumex crispus	Curly dock		1	1	II	1 - 1
Mentha aquatica	Water Mint	2			I	2 - 2
Agrostis stolonifera	Creeping Bent			3	I	3 - 3
Arrhenatherum elatius	False Oat-grass			2	I	2 - 2
Carex hirta	Hairy Sedge			1	I	1 - 1
Cirsium arvense	Creeping Thistle			1	I	1 - 1
Epilobium palustre	Marsh Willowherb	1			I	1 - 1
Festuca rubra	Red Fescue			4	I	4 - 4
Filipendula ulmaria	Meadowsweet		1		I	1 - 1

Scientific Name		Quadrat			Constancy	Range
		Q1	Q2	Q3		
Hypericum maculatum	Imperforate St John's-wort			1	I	1 - 1
Lathyrus pratensis	Meadow Vetchling			2	I	2 - 2
Myosotis	Forget-me-not	1			I	1 - 1
Potentilla reptans	Creeping cinquefoil			1	I	1 - 1
Ranunculus flammula	Lesser spearwort		1		I	1 - 1
Ranunculus repens	Creeping Buttercup			1	I	1 - 1
Rhinanthus minor	Yellow rattle			1	I	1 - 1
Rubus caesius	Dewberry			1	I	1 - 1
Solanum dulcamara	Bittersweet		2		I	2 - 2

SD15 Typha community

Scientific Name		Quadrat	Constancy	Range
		Q1		
Calliergonella cuspidata	Pointed Spear-moss	8	V	8 - 8
Hydrocotyle vulgaris	Marsh pennywort	8	V	8 - 8
Equisetum palustre	Marsh horsetail	8	V	8 - 8
Typha latifolia	Bulrush	7	V	7 - 7
Equisetum fluviatile	Water horsetail	7	V	7 - 7
Agrostis stolonifera	Creeping Bent	6	V	6 - 6
Mentha aquatica	Water Mint	5	V	5 - 5
Alopecurus geniculatus	Marsh Foxtail	2	V	2 - 2
Iris pseudacorus	Water Mint	2	V	2 - 2
Juncus articulatus	Jointed rush	2	V	2 - 2
Myosotis laxa	Tufted Forget-me-not	1	V	1 - 1

Quadrat data table

Overall Quadrat Number	NVC type	NVC specific quadrat number	Coefficient	Elevation	Wetness	Location	
						X	Y
1	SD17	1	28.11	5	6.3	331141	430362
2	SD16	1	45.17	5	5.7	331222	430447
3	SD16	2	36.85	6	5.7	331156	430522
4	SD16	3	49.96	6	6.1	331122	430556
5	SD16	4	45.78	5	6	331039	430614
6	SD16	5	38.27	5	6.3	331074	430629
7	SD16	6	40.82	5	6.3	331019	430667
8	SD16	7	48.39	5	6.4	331082	430564
9	SD16	8	51.32	5	6.4	331082	430713
10	SD16	9	40.22	5	6.1	331132	430778
11	SD16	10	55.61	5	5.8	331097	430777
12	SD16	11	39.93	5	6.4	330998	430804
13	SD16	12	50.82	6	6.7	331003	430928
14	SD16	13	49.12	5	6.4	331138	430732
15	SD16	14	42.52	5	5.7	330879	430863
16	SD16	15	41.6	6	5.7	330885	430795
17	SD16	16	43.07	5	6	330895	430739
18	SD16	17	47.38	5	6.4	331032	430398
19	SD16	18	57.92	5	6.3	331028	430407
20	SD16	19	44.69	5	5.6	331027	430429

Overall Quadrat Number	NVC type	NVC specific quadrat number	Coefficient	Elevation	Wetness	Location	
						X	Y
21	SD16	20	48.19	5	6.1	331009	430468
22	SD16	21	38.19	5	5.9	331000	430489
23	SD15	1	54.01	5	7.7	331171	430359
24	SD15	2	53.29	5	7.8	331185	430379
25	SD15	3	57.38	5	7.5	331181	430339
26	SD15	4	47.96	5	7.3	331220	430460
27	SD15	5	57.38	5	7.3	331078	430629
28	SD15	6	52.86	6	6.6	331190	430712
29	SD15	7	55.01	5	7.1	331085	430710
30	SD15	8	49.73	5	7.1	330988	430934
31	SD15	9	46.55	5	6.9	331115	430413
32	SD15	10	35.55	6	6.7	331083	430544
33	SD15	11	54.52	5	7.2	331191	430324
34	SD15	12	48.7	5	6.8	331019	430809
35	Iris - SD15	1	46.47	5	8	331190	430380
36	Iris - SD15	2	38.71	5	8.1	331221	430366
37	Iris - SD15	3	44.42	5	7.1	331149	430412
38	Typha - SD15	1	42.63	5	8.4	331156	430341
39	SD9	1	39.17	7	5.6	331228	430546
40	SD9	2	52.71	6	5.8	331126	430694
41	SD9	3	45.19	6	6.2	331055	430827

Overall Quadrat Number	NVC type	NVC specific quadrat number	Coefficient	Elevation	Wetness	Location	
						X	Y
42	SD9	4	53.4	5	5.9	330904	430795
43	SD9	5	53.4	6	5.6	330884	430782
44	SD9	6	51.78	6	5.7	331063	430317
45	SD9	7	47.46	9	6	331052	430914
46	SD9	8	43.84	8	5.9	331061	430463
47	SD9	9	52.74	7	5.9	331085	430444
48	MG1	1	47.62	6	6.2	331072	430964
49	MG1	2	35.85	6	6.2	331059	430946