Preliminary Environmental Information Report Volume 2

Appendix 8.3 Baseline Report – National Vegetation Classification Survey

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LIONLINK

Contents

1 Introduction

1.1 Project description

1.1.1 LionLink is a proposed electricity interconnector between Great Britain and the Netherlands that would supply up to 2 gigawatts (GW) of electricity and would connect to Dutch offshore wind via an offshore converter platform in Dutch waters (hereafter the Project).

1.1.2 The Proposed Scheme (defined as the part of the Project within the British jurisdiction) would involve the construction of the proposed Converter Station and the installation of offshore and onshore proposed Underground High Voltage Direct Current Cables (HVDC) to the proposed Converter Station and the proposed Underground High Voltage Alternating Current Cables (HVAC) between the proposed Converter Station and the Kiln Lane Substation.

1.2 Overview of survey approach

1.2.1 An Ecology Survey Strategy (ESS) was produced in March 2023, which explained the approach for ecological surveys to inform the baseline for the Proposed Onshore Scheme. The ESS set out the rationale and methods for how and when relevant ecological features would be identified to inform the design process. The aim of the ESS was to ensure that sufficient baseline data would be available to embed the mitigation hierarchy within the design, i.e. to avoid adverse impacts to valuable ecological features wherever possible, and to minimise any unavoidable adverse impacts.

1.2.2 Initial baseline ecological surveys commenced in 2023 on the basis of the Proposed Onshore Scheme Scoping Boundary (shown in Figure 1-2 of the EIA Scoping Report (Ref 1)). The Proposed Onshore Scheme Scoping Boundary included the proposed Landfall Site at Walberswick and the Landfall Site at Southwold. Subsequently, the Draft Order Limits (DOL) has been fixed in late 2024, reflecting design development and representing a substantial reduction on the Proposed Onshore Scheme Scoping Boundary, including the discounting of the Landfall Site at Southwold and the associated proposed Underground Cable Corridor (refer to **Chapter 3 Alternatives and Design Evolution**).

1.2.3 The initial stage of the ESS was to undertake Preliminary Ecological Appraisal (PEA) of all accessible areas within the Proposed Onshore Scheme Scoping Boundary, comprising a desk study for existing biological records and a field survey. PEA of most of the boundary was completed in 2023, with additional PEA surveys in 2024 to fill data gaps for previously inaccessible land. PEA field survey comprised:

a. mapping of the habitat types present following a published and recognised habitat classification that is appropriate for the site's location;

b. scoring the condition of habitat types present in accordance with Defra Metric criteria to inform the Biodiversity Net Gain (BNG) assessment;
c. an assessment of the possible presence of protected or priority species, and (where relevant) an assessment of the likely importance of habitat features present for such species;
d. mapping of any stands of non-native invasive plant species; and
e. recording of any incidental sightings of priority or protected species, or field signs of such species.

1.2.4 Desk study records and habitat classification mapping results from the PEA were reviewed at the end of the 2023 survey season to identify locations potentially comprising of higher biodiversity value habitats.

1.2.5 Siting and routeing appraisals and other design development work was progressed in parallel with the PEA surveys in 2023, guided by emerging survey results. This design work refined the likely boundaries of the proposed Landfall Site, the proposed Underground HVDC and HVAC Cable Corridors and associated temporary works.

1.2.6 The scope of detailed habitat surveys for 2024 was determined on the basis of the results of the PEA and desk study compared with the emerging refined corridor for the Proposed Onshore Scheme in late 2023, which still included the discounted Landfall Site at Southwold and the proposed Landfall Site at Walberswick. Confirmed or potential higher value habitats were scoped in for further detailed survey in 2024 where there remained a risk of potential impacts to these features, once embedded avoidance measures and likely boundary refinement were taken into account. This means that the spatial scope of these surveys responded to the evolving design to minimise unnecessary further survey of ecological features where it was clear that significant adverse impacts would be avoided, in accordance with the principles of the ESS.

1.2.7 The National Vegetation Classification (NVC) provides a comprehensive and systematic catalogue and description of the plant communities of Britain (Ref 1). Consequently, the NVC classification was utilised in order to provide greater botanical context for habitats

1.3 Purpose and scope of this document

1.3.1 The purpose of this report is to present the results of NVC surveys undertaken for the Proposed Onshore Scheme. The objectives of this report are to:

a. detail the results of NVC survey;
b. relate the results of the NVC survey to relevant habitat classification and designations; and
c. provide sufficient information to inform an assessment of potential impacts to habitats as a result of the Proposed Onshore Scheme.

1.4 Legislation

1.4.1 A framework of international, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This legislation will be listed in more detail within **Chapter 4 Legislation and Policy Overview**, **Appendix 4.1 Legislation and Policy Register**. Legislation relevant to and discussed within this report are:

a. Natural Environment and Rural Communities (NERC) Act 2006 (Ref 3).
b. The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations') (Ref 4), as amended.

Natural Environment and Rural Communities Act 2006

1.4.1 The UK Biodiversity Action Plan (UKBAP) 1994 – 2010 has been superseded by the UK Post-2010 Biodiversity Framework (Ref 5) covering the period 2011 – 2020. However, UKBAP priority habitats and species have been used to form the basis for the statutory list of habitats and species of 'principal importance for the conservation of biodiversity in England' as listed in accordance with Section 41 of the NERC Act 2006 (Ref 6).

1.4.2 Section 40 of the NERC Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England' when carrying out their normal functions. The local planning authority, therefore, must consider the impact on biodiversity of a proposed development. The NERC Act 2006 identifies habitats of 'principal importance for the conservation of biodiversity in England' (HPI) to guide public bodies in implementing their duty. This priority list includes a range of habitat types encountered throughout lowland England. The strategic direction for biodiversity policy for the next decade is set out in Biodiversity 2020: a national strategy for England's wildlife and ecosystem services (Ref 7).

The Habitats Regulations

1.4.3 Annex I of the Habitats Directive (Ref 8) (as amended by the 2003 Treaty of Accession) comprises a list of 189 habitat types for which Member States must consider designation of Special Areas of Conservation (SAC) for each of the features which occurs in their European territory. This includes the designation of extensive or exceptional areas of Annex I habitats as SAC.

1.4.4 In the context of the UK, 78 Annex I habitat types are believed to occur (Ref 9). A sub-set of the Annex I habitat types are defined as being 'priority' because they are considered to be particularly vulnerable and are mainly, or exclusively, found within the European Union (Article 1d).

1.4.5 Regulation 9 of the Conservation of Habitats and Species Regulations (CHSR) (Ref 10) aims to set out duties to ensure relevant public authorities are exercising their nature conservation functions in compliance with the Habitats Directive (Ref 8), as written here:

"9(1) The appropriate authority, the nature conservation bodies and, in relation to the marine area, a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the Directives"

1.4.6 Guidance on implementation of the relative principles in relation to Regulation 9 of the CHSR (Ref 11) are:

a. To maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna and flora, within the national territory taking account of economic, social, and cultural requirements and regional or local characteristics.
b. The designation, protection, and management of a coherent protected sites network including preventing their deterioration, avoiding disturbance of the species for which the sites have been designated in so far as disturbance could be significant.
c. The designation, protection, and management of a coherent protected sites network including preventing their deterioration, avoiding disturbance of the species for which the sites have been designated in so far as disturbance could be significant.

1.5 Status of habitats at a national level

1.5.1 The status of habitats at the national scale is mixed and varies between types and regions, reflecting changing land uses and other anthropogenic pressures Ref 13.

1.5.2 In 2019, 8% of UK habitats listed in Annex I of the EU Habitats Directive were in favourable conservation status, increasing from 3% in 2013 (Ref 14). However, the picture of how the conservation status of such higher conservation value habitats in the UK context is mixed. The conservation status of 48% of the habitats was unfavourable-improving in 2007, it decreased to 31% in 2013 and 20% in 2019. The conservation status of 30% of the habitats was unfavourable-declining in 2007, this decreased to 25% in 2013 and 23% in 2019. The proportion of the habitats assessed as unfavourable-stable increased from 10% in 2007, to 38% in 2013, and 48% in 2019.

1.6 Status of habitats at a regional level

1.6.1 Suffolk's archived Biodiversity Action Plan (BAP) outlines those HPI present within Suffolk and actions for their protection (Ref 15). The Suffolk Nature Strategy (Ref 16) sets out the requirement to promote the preservation, restoration and re-creation of these priority habitats and associated ecological networks ecological networks.

1.6.2 HPI and Annex I habitat types considered to be of potential relevance to this report listed in **Table 1.1**.

Table 1.1: HPI and Annex 1 habitat types of relevance to this report.

HPI	Annex 1
Lowland dry acid grassland	2130 Fixed dunes with herbaceous vegetation ('grey dunes')
Lowland meadows	6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)
Coastal and floodplain grazing marsh	
Coastal sand dunes	

2 Methodology

2.1 Field survey

2.1.1 NVC surveys were undertaken on 17-19 June 2024. Surveys were led by surveyors holding at least a Field Identification Skills Certificate Level 4 (Ref 17) and experienced in NVC survey methodology in a variety of habitat types.

2.1.2 The survey was undertaken in the optimal survey period for the habitat types surveyed. Weather conditions were optimal, with minimal precipitation and light winds.

2.1.3 The field survey methods followed standard nationally accepted NVC survey protocols above (Ref 1). For each area of interest surveyed this involved selecting homogenous stands of vegetation that were typical of the communities present. Sample areas were located towards the centre of the habitat where possible to avoid any edge habitat. Each area was first walked in full to locate homogenous stands for quadrat sampling, additionally recording any protected and/or notable plant species identified in order to provide greater context in the evaluation of the communities following the NVC survey.

2.1.4 For sampling grassland and heathland areas, 2x2m and 4x4m quadrat samples were used respectively (Ref 1). The locations of homogenous stands and corresponding sampling quadrats are shown in **Annex A: National Vegetation Classification (NVC) Survey Site Location Plan.**

2.1.5 During the survey, all botanical species within quadrats were recorded, with the exception of lichens and bryophytes, which require a high degree of specialism to identify in the field. In addition, microspecies were not identified. For example, brambles were assigned as (*Rubus fruticosus agg.*).

2.1.6 Each species present within the quadrats was assigned a percentage value, which then corresponds to a Domin scale of abundance (**Table 2.1**).

Table 2.1: Domin scale of abundance.

Percentage cover in quadrat	Domin scale
91-100%	10
76-90%	9
51-75%	8
43-50%	7
26-33%	6
11-25%	5
4-10%	4

Percentage cover in quadrat	Domin scale
<4% (many individuals)	3
<4% (several individuals)	2
<4% (few individuals)	1

2.2 Data analysis and interpretation

2.2.1 The data was analysed using the relevant British Plant Communities Volumes:

a. Mires and heaths (Ref 18).
b. Grasslands and montane communities (Ref 19).

2.2.2 Analysis was supplemented with analysis using Modular Analysis of Vegetation Information Systems (MAVIS) software (Ref 20) to aid with assignment of botanical communities.

2.3 Assumptions and limitations

2.3.1 No notable limitations were encountered during the field surveys, which was conducted within the optimal period for surveying the habitat types encountered, in suitable weather conditions and with no access restrictions.

2.3.2 Further surveys of confirmed or potential higher value habitats are scoped in for further detailed survey in 2025 and/or 2026 where there remains a risk of potential impacts to these features, once embedded avoidance measures and further boundary refinement were taken into account. Areas subject to further survey include:

a. habitats outside of the Proposed Onshore Scheme Scoping Boundary but now falling within the DOL; and
b. habitats within the internationally important designated sites covering the Minsmere – Walberswick area, which are crossed by the DOL, in order to inform design and mitigation measures related to the risk of frac out from trenchless techniques.

3 Results

3.1 Field survey

3.1.1 Full details of species recorded and relative abundance for each site are provided in **Annex B: NVC survey data**.

Site 1

3.1.2 Site 1 constituted a grassland in the central part of the Proposed Onshore Scheme, to the west of Theberton village and immediately south of Plumtreehills Covert. The grassland had formed in an area to the south of the woodland block, with a broadly south-western aspect. The area has been clearly landscaped, forming an undulating surface with several well-worn paths throughout, possibly kept open through use of motorcycles generating disturbance of the ground. Several large patches of scrub had also formed.

3.1.3 Given the history of disturbance and fine-scale variation in both aspect and substrate, the vegetation composition and structure showed similar variation throughout, with some areas rank and grass-rich, whilst others were largely dominated by lower growing forbs in a looser structure. Of graminoids, Yorkshire fog (*Holcus lanatus*), smooth meadow-grass (*Poa pratensis*) and false oat-grass (*Arrhenatherum elatius*) were the most frequent, with sweet vernal (*Anthoxanthum odoratum*), glaucous sedge (*Carex flacca*), cock's-foot (*Dactylis glomerata*), red fescue (*Festuca rubra*), creeping bent (*Agrostis stolonifera*) and perennial rye (*Lollium perenne*) more occasional. Bare sandy patches were dominated by squirrel-tail fescue (*Vulpia bromoides*). Forb diversity was similarly variant, with frequent grass vetchling (*Lathyrus nissola*), meadow buttercup (*Ranunculus acris*), black medick (*Medicago lupulina*), ribwort plantain (*Plantago lancelota*), common fleabane (*Pulicaria dysenterica*), common spotted orchid (*Dactylorhiza fuschii*) and cut-leaved crane's-bill (*Geranium dissectum*). Occasional forbs included agrimony (*Agrimonia eupatoria*), hairy tare (*Vicia hirsute)*, slender tare (*Vicia parviflora*), hoary ragwort (*Jacobaea erucifolia*), cat's-ear (*Hypochaeris radicata*) and bee orchid (*Ophrys apifera*), with species indicative of disturbance including bristly ox-tongue (*Helminthotheca radicata*), chicory (*Cichorium intybus*) and greater plantain (*Plantago major*).

Inset 3.1: Undulating grassland at Site 1

Site 2

3.1.4 Site 2 is a large meadow north-east of Theberton woods. The landowner reports that the meadow has never been ploughed or fertilised. Management consists of a single annual hay cut in the late summer. This land-use history and continuous management has led to a tall grass-dominated sward with a patchy distribution of forbs. However, the diversity of both grasses and forb species was relatively high.

3.1.5 Graminoid species present included the consistent presence of Yorkshire fog, sweet vernal grass, meadow foxtail (*Alopecurus pratensis*), meadow barley (*Hordeum brachyantherum*) and smooth meadow-grass, with a patchier distribution of glaucous sedge, Timothy (*Phleum pratense*), cock's foot, red fescue and crested dog's tail (*Cynoserus cristatus*). Frequent forbs included meadow buttercup, creeping buttercup (*Ranunculus repens*), pepper saxifrage (*Silaum silaus*), hoary ragwort, ribwort plantain, red clover (*Trifolium arvense*) and creeping cinquefoil (*Potentilla repens*), with more occasional occurrence of species such as bird's-foot-trefoil (*Lotus corniculatus*), common vetch (*Vicia sativa*), common fleabane and spiny restharrow (*Ononis spinosa*). Grass vetchling and common spotted orchid were each recorded outside of quadrats.

Inset 3.2: Hay meadow at Site 2.

Site 3

3.1.6 Site 3 constituted a grassland in the central part of the Proposed Onshore Scheme, south of the Old Minsmere River floodplain. The grassland sits on a primarily northern to northeastern aspect, managed primarily through rotational grazing of sheep and horses.

3.1.7 The sward of the grassland reflects the management, with a relatively homogenous, species-poor sward throughout. The botanical species present were generally typical of grazed grassland settings. Graminoids were dominated by Yorkshire fog, smooth meadow-grass and crested dog's tail, with more occasional perennial rye, sweet vernal, red fescue and cock's foot. Forbs comprised a relatively minor element of the sward, excepting common ragwort (*Jacobaea vulgaris*) which was almost ubiquitous. Other occasional forbs included meadow buttercup, field bindweed (*Convolulus arvensis*) and white clover (*Trifolium repens*). Yellow rattle (*Rhinanthus minor*) was notable throughout the lower southern section of the field, likely colonising from the adjacent species-rich fen and grassland within the Minsmere Old River floodplain at the base of the valley.

Inset 3.3: Sheep grazed grassland at Site 3.

Site 4

3.1.8 Site 4 is within the northern part of the Proposed Onshore Scheme, near the beachfront in Southwold. The site constitutes an area of sandy heathland located behind a seawall and car park, forming a relatively flat area separated from coastal processes. The area is fenced off with little human disturbance, though several footpaths cut through. The area appears to be largely unmanaged, with prevalent rabbit grazing identified. The area rapidly blends into mixed scrub and wetland habitats within Coastal and Floodplain Grazing Marsh (CFGM) to the west.

3.1.9 Species identified constituted a mixture of sandy coastal specialists, and those typical of dry acid soils found on heaths. Sand sedge (*Carex arenaria*) was ubiquitous and dominant throughout, with Yorkshire fog, common bent (*Agrostis capillaris*) and early hair-grass (*Aira praecox*) more minor components. Both sheep's fescue (*Festuca ovina*) and fine-leaved fescue (*Festuca filiformis*) were present in localised areas. Forbs typical of sandy heathlands included common gorse (*Ulex europaeus*), sheep's sorrel (*Rumex acetosella*), slender thistle (*Carduus tenuiflorus*), wall pennywort (*Umbilicus rupestris*), springbeauty

(*Claytonia perfoliata*) and slender parsley-piert (*Aphanes australis*). Species more indicative of disturbed ground were also present, with common ragwort and common nettle (*Urtica dioica*) found throughout.

Inset 3.4: Sandy heathland at Site 4.

Site 5 – stand 1

3.1.10 Site 5 is located within the northern part of the Proposed Onshore Scheme, inland of the beachfront in Southwold. The site constitutes a broad area of CFGM, split into compartments by a wet ditch network and rotationally grazed by cattle. The rotational grazing led to a clear difference in sward structure, with the western fields more frequently and recently grazed. This is likely to be a result of these fields drying earlier in the spring and therefore facilitating grazing earlier in the year.

3.1.11 The sward in the western section (stand 1) was very homogenous, constituting a generally short sward dominated by coarse grasses, with only occasional patches of forbs. Yorkshire fog, rough meadow-grass (*Poa trivialis*), creeping bent and perennial rye were ubiquitous, with a patchier occurrence of red fescue

and marsh foxtail (*Alopecurus geniculatus*). Forbs were typical of cattle grazed grasslands, with frequent white clover, bulbous buttercup (*Ranunculus bulbosus*) and mouse-ear chickweed (*Cerastium fontanum*), and occasional meadow buttercup, creeping buttercup, creeping thistle (*Cirsium arvense*) and curled dock (*Rumex crispus*).

Inset 3.5: Cattle grazed CFGM in western area of Site 5.

Site 5 – Stand 2

3.1.12 The eastern field compartments at Site 5 (primarily stand 2) are grazed less frequently and later in the year, resulting in a far taller, denser sward, though again dominated by coarse grass species.

3.1.13 The overall species composition of Stand 2 is compartment is broadly similar to the western compartment, though with perennial rye largely replaced by meadow foxtail, as well as an increased prevalence of marsh foxtail. This correlates with these fields being less intensively grazed and beginning later in the growing season. A stand of meadow fescue (*Schedonorus pratensis*) was present outside

of the quadrats. Forb diversity was very low, with creeping buttercup prevalent, and white clover and curled dock occasional.

Inset 3.6: Cattle grazed CFGM in western area of Site 5.

3.2 Classifications

3.2.1 MAVIS analysis highlighted that each of the sites assessed correlated with the following:

a. Site 1 – Most strongly correlates to MG1a *Arrhenatherum elatius – festuca rubra* sub-community, though with further alignment with the MG9b *Holcus lanatus – Deschampsia cespitosa – Arrhenatherum elatius* sub-community. Additionally, strongly correlates to OV23 *Lolium perenne-Dactylis glomerata*, with tendency towards the OV23c *Plantago major-Trifolium repens* sub-community.
b. Site 2 – Most strongly correlates with MG4 *Alopecurus pratensis – Sanguisorba officinalis* communities, with some tendency to the MG4b Typical sub-community. There is also some correlation with the MG6 *Lolium perenna – Cynosurus cristatus* community.
c. Site 3 – Clearly correlates to the MG6 *Lolium perenna – cynosurus cristatus* community, with some tendency to the MG6a Typical sub-community.

d. Site 4 – Displays correlation to both the SD10 *Carex arenaria* community, as well as U1 *Festuca ovina – Agrostic capilaris – Rumex acetosella* community, with tendency to the U1f *Hypochoeris radicata* sub-community. It should be noted that the site did not display a strong correlation to any community.
e. Site 5 stand 1 – Most strongly correlates to MG11 *Festuca rubra – Agrostis stolonifera – potentialla anserina* community, with tendency towards the MG11a *Lolium perenne* sub-community.
f. Site 5 stand 2 – Most strongly correlates to MG10 *Holcus lanatus – Juncus effusus* community, with a small tendency towards the MG10a Typical sub-community.

3.2.2 Each of the community classifications above were checked and corroborated using the relevant British Plant Community Volumes for grasslands (Ref 19) and heaths (Ref 18). Discussion and further analysis using these volumes are presented in Section 4.

4 Discussion

4.1 Site 1

4.1.1 Analysis indicated Site 1 most strongly correlates to MG1a sub-community, though with further alignment with the MG9b sub-community. MG1 communities are characterised by a dominance of coarse grasses, usually false oat-grass, with lesser prevalence of Yorkshire fog and cock's-foot. Large umbellifers are generally prevalent, but most other tall herbs are infrequent. The MG1a sub-community is characterised by a higher prevalence of red fescue, generally during the earlier stages of grassland establishment before the coarser grasses seed in. Whilst species richness increases with age, the community is one of the poorer British grassland communities. MG1 communities fundamentally form in situations lacking grazing, and where not maintained by cutting with success rapidly into scrub and woodland. Informal treatment and physical disturbance is often associated with these grasslands and can lead to the high prevalence of ruderals within the sward.

4.1.2 MG9 communities are similarly dominated by coarse grasses, particularly tufted hair-grass (*Deschampsia cespitosa*), as well as Yorkshire fog, cock's-foot and false oat grass. The composition of these communities is largely dependent on the number, size and distribution of tufted hair-grass stands in the sward. The MG9b sub-community has a greater balance, or co-dominance, between the coarse grass species listed above.

4.1.3 In the context of Site 1, the vegetation clearly displayed elements of the key features of the MG1 communities, notably the presence of coarse grasses in an ungrazed environment with a variety of characteristic forbs. It is notable that false oat-grass was a lesser element of the sward than both Yorkshire fog and cock's-foot, diverging somewhat from the MG1 communities. However, the total absence of tufted hair-grass from the sward represents a significant divergence from the MG9 communities, likely reflecting the grasslands' formation on free draining soils and meaning this community is not attributable to the grassland at Site 1.

4.1.4 Additionally, the site strongly correlates to OV23c sub-community. OV23 community comprises coarse weedy grasses in a less enclosed cover, along with a wide range of perennial and ephemeral forb species in locally disturbed places. The OV23c sub-community is characterised by the constant presence of Yorkshire fog, with scattered false oat-grass and creeping bent. Forbs frequent in the sub-community include yarrow Achillea millefolium, black medick, hogweed and common vetch and common ragwort. OV23 communities largely form from seeding or natural colonisation of disturbed ground or made areas where there is only occasional mowing, some continuing disturbance and a general neglect of management.

4.1.5 Site 1 clearly displays a number of the key elements of the OV23c sub-community, formed on a landscaped area with minimal management, displayed through the encroachment of scrub, some continuing disturbance and a relatively open and varied sward. Several of the characteristic species also indicate strong alignment to the community, such as the constancy of Yorkshire Fog with lesser false oat-grass, as well as the prevalence of black medick.

4.1.6 Consequently, Site 1 can be considered to most closely align with the OV23c sub-community, though displaying elements of the MG1a grassland community. These vegetation types do not qualify under any conservation designations in the majority of contexts, though it should be noted that the structural and species diversity of the vegetation was high and is likely a notable biodiversity resource in a largely intensive agricultural context.

4.2 Site 2

4.2.1 Analysis indicated that Site 2 most strongly correlates with MG4 communities, with some tendency to the MG4b sub-community. MG4 communities form in lowland conditions where traditional hay-meadow treatment has been applied to seasonally flooded land on alluvial soils. MG4 meadows are typified by a management regime generally consisting of an annual hay crop, light winter grazing and light application of organic manures, with frequently the only fertiliser coming from the grazing animals and more significantly, alluvial silt deposited by winter flooding (Ref 21) (Ref 22). Species composition is varied depending on context, particularly winter inundation and management regime, but typically is species-rich. Meadow foxtail, red fescue, crested-dog's tail and perennial rye are generally the most abundant grasses, with characteristic forbs such as meadow buttercup, knapweed (*Centurea nigra*), great burnet (*Sanguisorba officinale*), and meadowsweet (*Filipendula ulmaria*), as well as a wide range of smaller species such as red clover, bird's-foot trefoil, mouse-ear chickweed, meadow vetchling and pepper saxifrage. MG4 grasslands qualify as both lowland meadow priority habitat, as well as an Annex 1 habitat type on the Habitats Directive (Ref 21).

4.2.2 The meadow at Site 2 does share a number of these characteristics, notably the annual hay cut and lack of historic ploughing or fertiliser application. However, a number of key elements of typical MG4 grasslands are not present at Site 2. The most significant divergence is the lack of winter inundation, with the meadow situated outside of any flood zone and little indication of inundation. Less significantly, the meadow is not subject to winter grazing, though noting that this is not a prerequisite feature of MG4 meadows.

4.2.3 It is likely that the alignment between the Site 2 meadow and MG4 communities has arisen as a result of the long-standing historic hay management and lack of ploughing or fertiliser application. Whilst somewhat species rich as a whole, the Site 2 meadow is dominated by coarse grass species, which is likely as a result of only a single hay cut annually, with no secondary cut or aftermath grazing to reduce regrowth of these species. Notably absent from the Site 2 meadow are

species typical of MG4 grasslands which signify periodic winter inundation, such as meadowsweet or great burnet. This indicates that the Site 2 meadow does not receive the seasonal inundation typical of MG4 communities and therefore represents a drier community.

4.2.4 Despite the imperfect alignment with MG4 communities, the meadow at Site 2 meets the criteria for qualification of lowland meadow priority habitat, comprising an unimproved neutral grassland in an enclosed landscape displaying a relatively species-rich sward with a range of prerequisite species (Ref 21) (Ref 22). The consistent presence of pepper saxifrage, a scarce and declining species which is a specialist of unimproved meadow habitats (Ref 22), throughout Site 2, adds further confidence to this conclusion. Further species typical of lowland meadow habitat (Ref 21) which were identified in Site 2 include bird's-foot trefoil, glaucous sedge and common spotted orchid. It is not considered that the grassland at Site 2 correlates strongly enough with MG4 communities to qualify as the corresponding Annex 1 habitat type.

4.2.5 It is notable that the meadow at Site 2 is currently under a relatively light management regime, consisting of a single annual hay cut in mid-summer. Enhancement of this grassland could therefore be undertaken through measures which would further reduce the dominance of coarse grass species, particularly either a second hay cut in the late summer or early autumn, or through light aftermath grazing in the autumn and/or winter months (Ref 23).

4.3 Site 3

4.3.1 Grassland at Site 3 strongly correlates to the MG6 community, with some tendency to the MG6a sub-community.

4.3.2 MG6 communities are characterised by a dominance of perennial rye-grass and crested dog's-tail in a short sward, with red fescue and creeping bent frequent components. The intensity and history of grazing is a major determinant of exact composition, but forbs are generally few excepting co-dominant white clover and more occasional mouse-ear chickweed, ribwort plantain, meadow buttercup and yarrow. Tall forbs are generally limited to pernicious weeds common ragwort and creeping thistle. The MG6a sub-community is largely similar, though with a higher prevalence of creeping bent, creeping buttercup and spear thistle. MG6 grasslands are the most characteristic community of permanent pasture in lowland Britain given all the major grasses are palatable to livestock.

4.3.3 The grassland at Site 3 closely aligns to each of the key elements of the community described above, in both species and structural composition. Therefore, the grassland can be confidently attributed to the MG6a sub-community, a common habitat type with no qualifying conservation designations in the majority of contexts.

4.4 Site 4

4.4.1 Site 4 primarily displays correlation to the SD10 community, with tendency to SD10b sub-community. The SD10 community occurs a variety of dune contexts on both more calcareous and acidic substrates, but is characterised by sand sedge as by far the most dominant plant, often forming dense mats through creeping rhizomes. Particularly in more stable and well established dune systems, spread of clonal growth can be extremely dense. Whilst usually at a low occurrence, grasses such as Yorkshire fog, cock's-foot and common bent may be present, with each of the two sub-communities defined by the presence of either red fescue or sheep's fescue. On more stable, sheltered ground, early hair-grass may sometimes be present. The SD10b sub-community is characterised by the presence of sheep's fescue in more acidic conditions, along with weedy associates such as common ragwort, common bent, mouse-ear chickweed, sheep's sorrel, ribwort plantain and lady's bedstraw (*Galium verum*).

4.4.2 Site 4 also displayed some correlation to the U1 community, with tendency to U1f sub-community. U1f grasslands form on a wide variety of acidic conditions to form a distinct vegetation with an open sward of small grasses, primarily sheep's fescue and common bent. In less dry soils, other grasses such as sweet vernal or Yorkshire fog can form a more minor component, as can wavy hair-grass (*Deschampsia flexulosa*). Grazing, erosion and parching all interact to dictate sward formation and play a role in the presence of characteristic species, many of which are small ephemeral species. Sheep's sorrel is the most consistent forb, with presence of other species largely dictated by location and underlying conditions. The U1f sub-community is broadly similar, but very open with small grasses such as early hair-grass and annual meadow-grass present on bare ground between tussocks. Rosette forming species are common with a strong preference for cat's-ear over species such as ribwort plantain, buck's-horn plantain and lesser hawkbit (*Leontodon saxatilis*). Other infrequent species include wall pennywort and English stonecrop (*Sedum angelicum*).

4.4.3 Whilst clearly most strongly resembling core features of the SD10b sub-community in terms of composition, it should be noted that the context for formation is variant. SD10 communities are typical of sand dunes, which form in a variety of situations in which an adequate supply of sand is deposited in the intertidal zone where onshore winds then blow the sand landwards to deposit above the high-water mark (Ref 21) (Ref 24). Given the presence the sea wall between Site 4 and the intertidal zone, Site 4 is clearly separated from the natural coastal processes described, with the sandy substrate likely arising as a remnant of a past dune system prior to sea wall construction, or as deposited substrate following the construction. It can therefore be concluded that Site 4 does not qualify as the corresponding sand dune priority habitat or associated Annex 1 habitat types.

4.4.4 Consequently, Site 4 should be attributed the U1f sub-community, noting the presence of features characteristic of sand dune communities resulting from the historic context under which this habitat has formed and been subsequently managed. Whilst a relatively poor fit overall, as a U1 community with a number of key requisite indicator species present (Ref 21), Site 4 qualifies as lowland dry acid grassland priority habitat (Ref 25).

4.5 Site 5 – stand 1

4.5.1 The first homogenous stand at Site 5 strongly correlates to MG11 community, with strong tendency towards the MG11a sub-community. MG11 communities are characterised by species-poor swards where creeping bent, red fescue and/or silverweed (*Potentilla anserina*) are dominant. Other grasses are generally poorly represented, as are forbs other than silverweed, excepting white clover. The MG11a sub-community differs in that it occurs in more closed stands which are inundated and usually improved by fertilisers and occasionally ploughing for use as intensive pasture. Perennial rye becomes a more constituent component, as do other coarse grasses such as Yorkshire fog, meadow fescue, cock's-foot and Timothy. Forbs in the sub-community include white clover, creeping buttercup, dandelion (*Taraxacum officinale* agg.), creeping thistle and mouse-ear chickweed.

4.5.2 Stand 1 at Site 5 clearly aligns with each of the key characteristics of the MG11a sub-community, namely winter inundation and use as intensive pasture, resulting in a co-dominance between each of the coarse grass species typical of the habitat type. MG11 is a common habitat type with no qualifying conservation designations in the majority of contexts, however, it should be noted that in the context of as CFGM priority habitat (Ref 21) (Ref 26).

4.6 Site 5 – stand 2

4.6.1 The second homogenous stand at Site 5 strongly correlates to MG10 community, with strong tendency towards the MG10a sub-community. MG10 communities are characterised by a tall, species-poor, grass dominated sward forming on permanently moist soils, generally on managed through grazing. Ditches, depressions and pools can form important features which provide variation to the sward. Yorkshire fog and creeping bent are constant species with a far lower prevalence of rough meadow-grass, perennial rye, marsh foxtail, meadow foxtail and meadow fescue. Forbs are generally few in number but include creeping and meadow buttercup, cuckooflower (*Cardamine pratensis*), white clover, ribwort plantain, silverweed and mouse-ear chickweed. The MG10a sub-community differs only in that soft rush (*Juncus effusus*) is the most prominent rush species.

4.6.2 Stand 2 at Site 5 clearly aligns with each of the key characteristics of the MG10 community, namely permanently damp soils, with these field compartments receiving longer winter inundation that the adjacent stand 1. Given the lack of rushes recorded, it is considered that the stand does not align strongly with the MG10a sub-community and should be considered as the broader MG10. MG10 is

a common habitat type with no qualifying conservation designations in the majority of contexts, however, it should be noted that in the context of Site 5, stand 2 qualifies as CFGM priority habitat (Ref 21) (Ref 26).

5 Conclusions

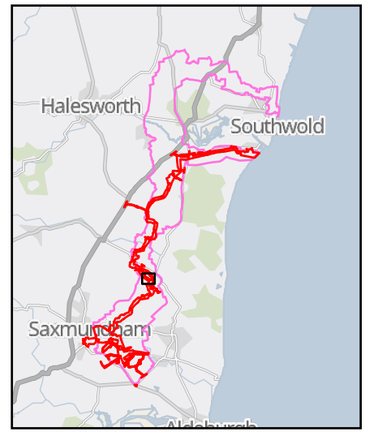
5.1.1 The results of the NVC surveys across the Proposed Onshore Scheme Scoping Boundary and subsequent data analysis and interpretation highlighted that three of the five surveyed sites qualify as HPI; Site 2 as lowland meadow, Site 4 as lowland dry acid grassland, Site 5 (both stands) as CFGM. It is notable that whilst Site 5 qualifies as CFGM its botanical value of the grasslands are limited, being a common and widespread habitat types found in agricultural landscapes. None of the habitats surveyed were considered to qualify as Annexe 1 habitat types.

5.1.2 Further NVC surveys are scoped in to further inform avoidance and mitigation measures relating to habitats, the results of which will be presented in the Environmental Statement.

5.1.3 In accordance with the ESS, the design should seek to avoid impacts to priority habitats wherever feasibly possible, including appropriate buffers, through design measures such as routing and trenchless techniques.

Annex A: National Vegetation Classification (NVC) Survey Site Location Plan

Quadrats
NVC Survey Extent
Proposed Onshore Scheme Draft Order Limits
Proposed Onshore Scheme Scoping Boundary



Coordinate System: British National Grid

Metres
0 30 60 120

Rev	Date	By	Chkd	Appd	Authd
02	26/09/2025	AW	JM	LC	LC

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Client
National Grid LionLink Limited (NGLLL)

Project Name
LIONLINK

Drawing Title
National Vegetation Classification (NVC) Survey Site Location Plan

Sheet 1 of 3

Scale at A3
1:2,500

Role
National Vegetation Classification Survey

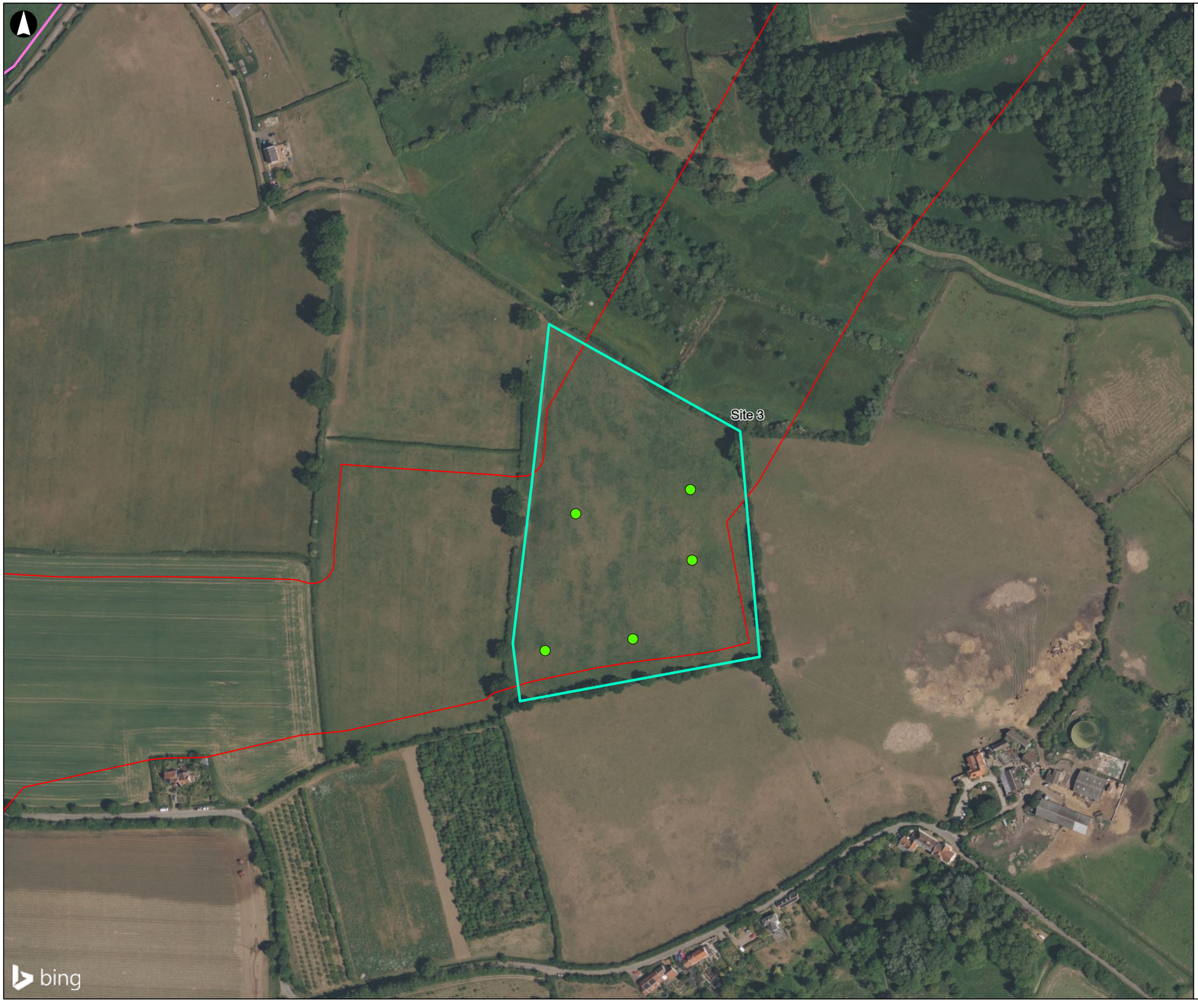
Suitability
For Information

Project Number
287334-00

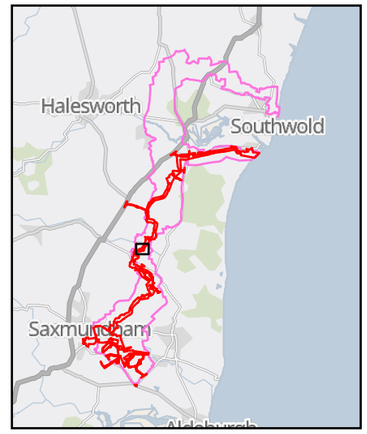
Rev
02

Drawing Number
LL-ARP-FIG-ENV-0166-P01

A3



Quadrats
NVC Survey Extent
Proposed Onshore Scheme Draft Order Limits
Proposed Onshore Scheme Scoping Boundary



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Rev	Date	By	Chkd	Appd	Authd
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Sheet 2 of 3

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National Vegetation Classification Survey

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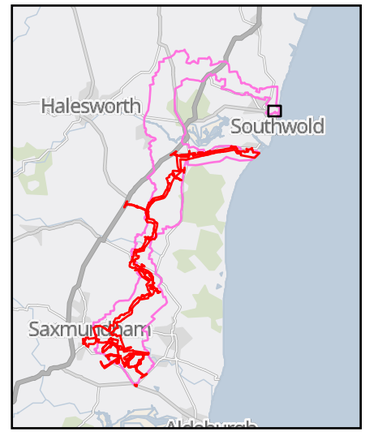
Rev
02

Drawing Number
LL-ARP-FIG-ENV-0166-P01

A3

Quadrats
NVC Survey Extent
Proposed Onshore Scheme Draft Order Limits
Proposed Onshore Scheme Scoping Boundary



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National Vegetation Classification (NVC) Survey Site Location Plan

Sheet 3 of 3

Scale at A3
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Role
National Vegetation Classification Survey

Suitability
For Information

Project Number
287334-00

Rev
02

Drawing Number
LL-ARP-FIG-ENV-0166-P01

A3

Annex B: NVC survey data

B.1 Site 1 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	8	8	7	6	7
Sweet vernal-grass	*Anthoxanthum odoratum*				4	
Smooth meadow-grass	*Poa pratensis*			2	4	
Cock's-foot	*Dactylis glomerata*	4	3	5	4	6
Red fescue	*Festuca rubra agg.*		5			
Crested dog's-tail	*Cynosurus cristatus*	5				
False oat-grass	*Arrhenatherum elatius*			8	1	4
Creeping bent	*Agrostis stolonifera*		6	1	2	
Perennial rye-grass	*Lolium perenne*		3	2		
Soft brome	*Bromus hordeaceus*			1		
False brome	*Brachypodium sylvaticum*					3
Squirrel-tail fescue	*Vulpia bromoides*			7	8	5
Reed canary-grass	*Phalaris arundinacea*	5	4			
Glaucous sedge	*Carex flacca*	4				4
Meadow buttercup	*Ranunculus acris*	1		5	4	1
Creeping buttercup	*Ranunculus repens*			4	2	
Bird's-foot-trefoil	*Lotus corniculatus*					5

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Creeping cinquefoil	*Potentilla repens*				4	
Agrimony	*Agrimonia eupatoria*			1		4
White clover	*Trifolium repens*	5				
Black medick	*Medicago lupulina*	4	6		7	4
Hairy tare	*Vicia hirsuta*	5				
Slender tare	*Vicia parviflora*				4	
Grass vetchling	*Lathyrus nissola*	1	6	4	5	
Mouse-ear chickweed	*Cerastium fontanum*	1		1		
Cow parsley	*Anthriscus sylvestris*			1		
Hogweed	*Heracleum sphondylium*			4		
Common vetch	*Vicia sativa*		5	3	1	
Creeping thistle	*Cirsium arvense*	4			1	
Spear thistle	*Cirsium vulgare*				1	
Hoary ragwort	*Jacobaea erucifolia*	5		4		
Common ragwort	*Jacobaea vulgaris*			4		
Ribwort plantain	*Plantago lanceolota*	4			6	4
Greater plantain	*Plantago major*	3		3		
Common fleabane	*Pulicaria dysenterica*	5	5	4	4	4
Bristly ox-tongue	*Helminthotheca echioides*			5	4	5

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Cat's-ear	*Hypochaeris radicata*				2	
Common spotted orchid	*Dactylorhiza fuchii*	2		2	2	
Bee orchid	*Ophrys apifera*			2		
Ash	*Fraxinus excelsior*	2		3		
Cut-leaved crane's-bill	*Geranium dissectum*		3	2	1	3
Ground-ivy	*Glechoma hederacea*			2		

B.2 Site 2 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	7	4	5	8	8
Meadow foxtail	*Alopecurus pratensis*	6	2	4	4	
Meadow barley	*Hordeum brachyantherum*	6	6	5	5	7
Sweet vernal-grass	*Anthoxanthum odoratum*	5	7	8	5	5
Timothy	*Phleum pratense*	1	2	2		
Smooth meadow-grass	*Poa pratensis*	4	5	4	4	
Cock's-foot	*Dactylis glomerata*		5			

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Red fescue	*Festuca rubra agg.*		7	7	5	7
Crested dog's-tail	*Cynosurus cristatus*				4	4
Glaucous sedge	*Carex flacca*		5			
Meadow buttercup	*Ranunculus acris*	6	5	5	5	5
Creeping buttercup	*Ranunculus repens*		4	3	5	4
Bird's-foot-trefoil	*Lotus corniculatus*	4				4
Creeping cinquefoil	*Potentilla repens*	4	5	5	4	5
Red clover	*Trifolium arvense*	3		3	4	3
Spiny restharrow	*Ononis spinosa*	4				
Mouse-ear chickweed	*Cerastium fontanum*		4	1	1	
Pepper saxifrage	*Silaum silaus*		4	5		4
Common vetch	*Vicia sativa*		1			
Creeping thistle	*Cirsium arvense*		4			
Yarrow	*Achillea millefolium*		1			
Hoary ragwort	*Jacobaea erucifolia*		3	1	1	4
Field bindweed	*Convolvulus arvensis*		1			
Ribwort plantain	*Plantago lanceolota*			4	5	5
Bramble	*Rubus fruticosus agg.*			4		
Common sorrel	*Rumex acetosa*			1		
Common fleabane	*Pulicaria dysenterica*					2

B.3 Site 3 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	7	8	7	7	8
Sweet vernal-grass	*Anthoxanthum odoratum*	4	5		4	
Meadow foxtail	*Alopecurus pratensis*	4				
Smooth meadow-grass	*Poa pratensis*	4	5	5		4
Cock's-foot	*Dactylis glomerata*			3		4
Red fescue	*Festuca rubra agg.*	5	7		4	
Crested dog's-tail	*Cynosurus cristatus*	4	7	8	7	
Creeping bent	*Agrostis stolonifera*	5			4	
Perennial rye-grass	*Lolium perenne*		4	3		4
Soft brome	*Bromus hordeaceus*		4			
Timothy	*Phleum pratense*			2		
Meadow buttercup	*Ranunculus acris*	4		2	4	
Yellow rattle	*Rhinanthus minor*	5	4			2
Red bartsia	*Odontites vernus*				4	1
Field bindweed	*Convolvulus arvensis*	4		4	4	
Red clover	*Trifolium arvense*		3			
White clover	*Trifolium repens*	4	4	4		
Mouse-ear chickweed	*Cerastium fontanum*	3		4		

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Creeping thistle	*Cirsium arvense*				4	
Common ragwort	*Jacobaea vulgaris*	4	5	6	6	4
Germander speedwell	*Veronica chamaedrys*			2		
Ribwort plantain	*Plantago lanceolota*	4		4	4	4
Daisy	*Bellis perennis*		1			
Cat's-ear	*Hypochaeris radicata*					3
Smooth hawk's-beard	*Crepis capillaris*					1

B.4 Site 4 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	4		4	4	4
Common bent	*Agrostis capillaris*	4	5			
Annual meadow-grass	*Poa annua*	2				
Early hair-grass	*Aira praecox*	4	4		2	4
Sheep's fescue	*Festuca ovina*				6	
Fine-leaved fescue	*Festuca filiformis*				4	
Squirrel-tail fescue	*Vulpia bromoides*	3				
Sand sedge	*Carex arenaria*	8	8	9	8	7
Common gorse	*Ulex europaeus*	5	4			

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Slender parsley-piert	*Aphanes australis*	2		1		
Buck's-horn plantain	*Plantago coronopus*		1		3	
Sheep's sorrel	*Rumex acetosella*		4			5
Curled dock	*Rumex crispus*					2
Changing forget-me-not	*Myosotis discolor*			2		
Wall speedwell	*Veronica arvensis*	2				3
Slender thistle	*Carduus tenuiflorus*		1		2	4
Mouse-ear chickweed	*Cerastium fontanum*	3	1		2	
Common ragwort	*Jacobaea vulgaris*	2	5	4	5	7
Cat's-ear	*Hypochaeris radicata*					1
Lesser hawkbit	*Leontodon saxatilis*					1
Bramble	*Rubus fruticosus agg.*	1				
Common nettle	*Urtica dioica*	2		5		4
Wall pennywort	*Umbilicus rupestris*		2			
Springbeauty	*Claytonia perfoliata*			8		

B.5 Site 5 – stand 1 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	4	5		5	6

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Rough meadow-grass	*Poa trivialis*	7	7	8	7	7
Red fescue	*Festuca rubra agg.*		4			
Creeping bent	*Agrostis stolonifera*	8	7	7	7	8
Perennial rye-grass	*Lolium perenne*	4	5	5	4	4
Marsh foxtail	*Alopecurus geniculatus*		4		5	
Wall barley	*Hordeum murinum*			1		
Meadow buttercup	*Ranunculus acris*				4	
Bulbous buttercup	*Ranunculus bulbosus*	5		5	5	5
Creeping buttercup	*Ranunculus repens*				7	
White clover	*Trifolium repens*	4	3	4		
Mouse-ear chickweed	*Cerastium fontanum*		1	1		3
Creeping thistle	*Cirsium arvense*		1			3
Curled dock	*Rumex crispus*					4

B.6 Site 5 – stand 2 raw survey data

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Yorkshire fog	*Holcus lanatus*	3	4	7	7	5
Meadow foxtail	*Alopecurus pratensis*		5	6	5	5

Common Name	Scientific name	Qaudrat coverage (Domi scale)				
		Q1	Q2	Q3	Q4	Q5
Marsh foxtail	*Alopecurus geniculatus*	8	7			7
Rough meadow-grass	*Poa trivialis*	6	8	8	8	8
Red fescue	*Festuca rubra agg.*	4			4	
Crested dog's-tail	*Cynosurus cristatus*					1
Creeping bent	*Agrostis stolonifera*	7	5		7	5
Perennial rye-grass	*Lolium perenne*					4
Creeping buttercup	*Ranunculus repens*	5	4	5	6	4
White clover	*Trifolium repens*	4	4			
Silverweed	*Potentilla anserina*				2	
Curled dock	*Rumex crispus*				2	5

Glossary and Abbreviations

Term	Definition
gigawatts	GW
BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
CFGM	Coastal and Floodplain Grazing Marsh
CHSR	Conservation of Habitats and Species Regulations
DOL	Draft Order Limits
ESS	Ecology Survey Strategy
HPI	Habitats of Principal Importance
HVDC	High Voltage Direct Current Cables
HVAC	High Voltage Alternating Current Cables
MAVIS	Modular Analysis of Vegetation Information Systems
NERC	Natural Environment and Rural Communities
NVC	National Vegetation Classification
PEA	Preliminary Ecological Appraisal
SAC	Special Areas of Conservation
The Proposed Scheme	The term Proposed Scheme will be used when referring to the GB scheme components as a whole and will not include the Dutch components.
The Proposed Onshore Scheme	The term used when referring to the onshore components of the Proposed Scheme.
UKBAP	UK Biodiversity Action Plan

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