Peartree Hill Solar Farm

Environmental Statement

Volume 4

Appendix 7.1: Preliminary Ecological Appraisal Report

Planning Act 2008

Infrastructure Planning

(Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)

Application Document Ref: EN010157/APP/6.4

February 2025

Prepared by RSK on behalf of RWE Renewables UK Solar and Storage LTD

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of a preliminary ecological appraisal (PEA) comprising a background data search (BDS) and a UK Habitat survey, with assessment for protected or otherwise notable species. Surveys were carried out in connection with the proposed Peartree Hill Solar Farm (the 'Proposed Development') on land east of Beverley, East Riding of Yorkshire (the 'Site'). The 'Order Limits' (i.e. the maximum extent within which the Proposed Development can be carried out) are shown in **Figure 1**.

1.1.2 In addition to the habitat survey, trees were assessed for roosting bats in a ground-level tree assessment (GLTA) and waterbodies (ponds and ditches) within 500m of Land Areas B to F were assessed for their suitability to support great crested newt (*Triturus cristatus*). Samples were taken to determine if waterbodies contained GCN environmental DNA (eDNA) where appropriate and where access permitted.

1.1.3 The PEA survey of Land Areas B to F were surveyed in 2023 while the PEA of the grid connection cable route and interconnecting cable routes were surveyed in 2024.

1.1.4 The following terminology is used throughout this report:

- Land Areas – The proposed areas for solar PV development, including areas for environmental mitigation and enhancement, outlined by the red line boundary as shown in **Figure 1**. The Land Areas do not include the grid connection cable route, interconnecting cable routes or site access roads from the nearby road network.
- Grid connection cable route – The cable route which links the Proposed Development to National Grid Creyke Beck Substation.
- Interconnecting cable routes – The cable routes that run between the Land Areas.

1.1.5 Note this report does not consider in detail the likely impacts on ecological receptors as a result of the Proposed Development or mitigation requirements as this is assessed within **Environmental Statement (ES) Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and for International Sites the **Habitats Regulations Assessment – Information to inform an Appropriate Assessment [EN010157/APP/5.3]**.

1.1.6 The appraisal was carried out on behalf of RWE Renewables UK Solar and Storage Ltd.

1.2 Development proposals

1.2.1 The Proposed Development comprises the construction, operation (including maintenance) and decommissioning of a solar photovoltaic (PV) electricity generating and storage facility with an export capacity of up to 320 megawatts (MW) and associated infrastructure, as described within **ES Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1]** and **Schedule 1** of the **Draft DCO [EN010157/APP/3.1]**.

1.2.2 The Proposed Development will connect to the National Grid Creyke Beck Substation via underground cables.

1.3 Site context

1.3.1 The Order Limits encompasses an area of approximately 891 hectares (ha) and are located between the villages of Leven, Tickton, Riston, Wawne, Weel and Woodmansey, to the north of the city of Hull

1.3.2 The Order Limits comprise several Land Areas (labelled B to F) and sections of cable route, identified as follows:

- Land Area B: Land north-west of Long Riston;
- Land Area C: Land west of Arnold;
- Land Area D: Land south of the A1035;
- Land Area E: Land east of Weel;
- Land Area F: Land north of Wawne;
- Interconnecting cable routes: Cable B-B, Cable C-D, Cable E-E and Cable E-F;
- Grid connection cable route.

1.3.3 Each Land Area is made up of number-referenced fields (e.g. B1). Most of these are arable fields. However, there are also some fields of grazed grassland, and relatively small areas of neutral grassland, broadleaved woodland and scrub in some of the fields. The fields are divided by hedgerows, farm access tracks, ditches and watercourses, and there are also some small woodland blocks.

1.3.4 The surrounding land is largely agricultural land, farmsteads and minor settlements with a complex network of watercourses and ditches. Land Areas B to F have few roads other than Meaux Lane, which cuts through the centre of Land Areas D and F. The easternmost Fields B5 and B6 are separated from the rest of the Land Areas by the A165 road. The River Hull flows close to the western edges of the Land Area E and intersects the proposed grid connection cable route. The town of Beverley lies *c.*1.3km west of the Land Areas at the nearest point. The North Sea and the Humber Estuary each lie *c.*10 km to the east and south respectively.

1.3.5 The interconnecting cable routes are located between the Land Areas and comprise mostly arable fields bordered by hedgerows and wet drains/ditches.

1.3.6 The grid connection cable route links the Proposed Development to National Grid Creyke Beck Substation, located close to Cottingham. The habitat within the cable route is mostly arable fields, however there are sections of modified grassland and notable habitats within Figham Pastures Local Wildlife Site.

2.0 METHODS

2.1 Overview

2.1.1 The PEA was undertaken in line with guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017); it therefore included:

- a desk study (here called a background data search (BDS)), which included a review of aerial photographs; obtaining information from the DEFRA and JNCC websites, and the local authority website; requesting data from the local records centre; and
- a field survey that informed habitat mapping, an assessment of the possible presence of protected or priority species and the likely importance of habitat features.

2.1.2 The PEA report includes an ecological description and information about species that may occur there. Notes and mapping of any incidental sightings of invasive non-native plant species and protected or priority fauna species are also provided.

2.1.3 The surveys presented here were carried out between June and September 2023 and in August 2024 by suitably qualified RSK ecologists, as per the following schedule:

- 1, 7 and 13 June 2023 – great crested newt (GCN) Habitat Suitability Index (HSI) and eDNA surveys of ponds and ditches within 500 m of Land Areas B to F.
- 8-22 August and 4 September 2023 – PEA and ground level tree assessment (GLTA) of Land Areas B to F.
- 13–22 August 2024 – PEA, GLTA and preliminary roost assessment (PRA) of the grid connection cable route and interconnecting cable routes.

2.1.4 The PEA was led by RSK senior ecological consultant, Staff No. BL18 (BSc, MSc, MCIEEM) and ecological consultant Staff No. DL41 (BSc, MSc). The GCN surveys were led by RSK principal ecological consultant Staff No. LW37 (BSc, MCIEEM). All surveyors are suitably qualified and experienced.

2.2 Background data search

2.2.1 The BDS did not include access routes or interconnecting cable routes within its defined boundary. However, these areas were covered by the broader search area for the Land Area B to F and the grid connection cable route due to buffer distance. A search was made in August 2024 for relevant reference materials. A list of sources is given in **Table 1**.

Table 1: Data sources

Information obtained	Available from
Protected and noteworthy species-records	North & East Yorkshire Ecological Data Centre
Designated site locations and citations	Natural England website
Designated site locations and citations	Joint Nature Conservation Committee (JNCC) website
Designated site locations and citations	North & East Yorkshire Ecological Data Centre
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Areas / Habitats of Strategic Significance	https://www.eastriding.gov.uk/EasySiteWeb/GatewayLink.aspx?alId=105217
Areas / Habitats of Strategic Significance	National Habitat Networks https://www.data.gov.uk/dataset/0ef2ed26-2f04-4e0f-9493-ffbdbfaeb159/habitat-networks-england
Areas / Habitats of Strategic Significance	National Priority Focus Areas https://www.data.gov.uk/dataset/c20a40c5-c975-43e1-9abd-d1257aa58432/natural-england-national-priority-focus-areas
Areas / Habitats of Strategic Significance	Nature Improvement Areas https://www.data.gov.uk/dataset/a19c95e3-9657-457d-825e-3d2f3993b653/nature-improvement-areas
Aerial photography	As a viewer only, sources include: www.google.com; Google earth. Where reproduced as figures, sources vary and are licensed through ArcGIS, as stated.

2.2.2 A search was made for the following international designated sites of ecological importance within 10km of the Order Limits: Ramsar sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA)[1]. For statutory sites such as Sites of Special Scientific Interest (SSSI), the search was within 2km.

2.2.3 A search was also made for non-statutory designated sites and ancient woodlands (often important in a local context) within 1km of the Order Limits.

[1] SACs and SPAs were formerly called 'European Sites' and part of the Natura 2000 network; post-'Brexit', they are now considered part of the UK's 'national site network'. Ramsar sites are sites of international importance. See Appendix A for details. Note that SPAs, SACs and Ramsar sites are also underpinned by SSSI designations whose citations/boundaries may be slightly different.

2.2.4 The BDS also included a search for records within 1km of the Order Limits of noteworthy species, which might pose a constraint or require consideration in the planning process. Species included in the search were:

- European protected species (listed on Schedules 2 and 5 of The Conservation of Habitats and Species Regulations 2017 (as amended));
- nationally protected species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 (as amended) and The Protection of Badgers Act 1992;
- species listed as critically endangered, endangered or vulnerable based on the IUCN Red List Categories and Criteria 2001;
- all species listed on the RSPB's Birds of Conservation Concern 5 (Stanbury *et al.,* 2021) as red' or 'amber';
- nationally rare or nationally scarce species;
- notable[2] invertebrates; and
- species of principal importance listed under The Natural Environment and Rural Communities (NERC) Act 2006 or priority species under the relevant local biodiversity action plan (Nottinghamshire Biodiversity Action Group, 2020).

2.3 Plants and habitats

UKHab survey

2.3.1 The field survey was based on the UKHab survey methodology (UKHab Ltd, 2023). The UKHab classification system is the habitat classification that underpins the DEFRA Biodiversity Metric and is therefore the favoured habitat classification to use when surveys need to inform a Biodiversity Net Gain Calculation. This field survey was undertaken in line with CIEEM 2017 guidelines and involved the following elements:

- habitat mapping using a set of standard colour codes to indicate habitat types on a habitat map together with secondary codes that provide contextual information about the habitat (**ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]**); and
- a description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the habitat map, called 'target notes'.

2.3.2 Vascular plant species were recorded during the survey, although no attempt was made to produce an exhaustive species list (additional species would almost certainly be found during more detailed surveys or repeat surveys at various times of the year).

[2] Appendix C includes a description of 'notable' as used in this context.

2.3.3 Plant nomenclature in this report follows Stace (2021) with updated names from the list used by the Botanical Society of the British Isles for native and naturalised species of vascular plant. Mosses and liverworts follow Hill *et al*. (2008). Introduced species and garden varieties were identified using relevant Floras.

2.3.4 Habitat condition assessments were also carried out using the Statutory biodiversity metric condition assessments (Defra, 2024). The condition assessments were used to determine baseline biodiversity metric value. Details are provided in the **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]**.

Invasive non-native plant species (INNPS)

2.3.5 A UKHab survey does not involve exhaustive surveying for individual plant species, and various invasive species may be little in evidence at various times of year (depending on the species). A survey seeking to identify habitat types cannot therefore be relied upon to provide firm information about the presence or extent of INNPS. However, any such species that were encountered during the habitat survey would have been noted.

Hedgerow Assessment

2.3.6 An assessment of the hedgerows across the Order Limits has been undertaken to determine the likelihood of important hedgerows being present, as defined under The Hedgerows Regulations 1997.

2.3.7 The majority of the information regarding hedgerows was gathered during the UKHab survey as detailed above. Hedgerows which are classified as h2a5 Species-rich native hedgerow, have a minimum of four woody species per 30 m stretch (in the East Riding of Yorkshire). This corresponds to the minimum species required to be important in The Hedgerow Regulations 1997, part 2, ‘wildlife and landscape criteria for important hedgerow selection’, therefore, these hedgerows have been assessed against these criteria.

2.3.8 An additional survey was undertaken at nine sample points where hedgerows are likely to be directly impacted. Locations of hedgerows assessed are shown on **Figure 5**. Sample points comprised of a 30 m length of hedgerow, where information was collected, relevant to The Hedgerow Regulations 1997, part 2, wildlife and landscape criteria for determining ecologically important hedgerow selection. The field surveys were undertaken by RSK from 20 to 22 August 2024, by Staff No. RF33 (BSc (Hons) MCIEEM), who holds a level 4 field Identification Skills Certificate (FISC) in botanical survey.

Notable Plants – Arnold Drain LWS and arable plants

2.3.9 Targeted botanical survey was undertaken by RSK on 16 August 2024, by Staf no. RC42 (BSc., PH D, MCIEEM, C. Env.), an experienced botanist, and gold standard FISC assessor. The survey comprised a botanical survey to gather a species list, with subjective estimates of their relative abundance on the DAFOR scale (D – dominant, A – abundant, F – frequent, O – occasional,

R – rare, prefix V – very, prefix L – local), and a description of the character of the site. The targeted survey work comprised:

2.3.10 At Arnold Drain LWS, approximately 35% of the LWS was assessed, the steep sides of the drain are *c.*6m high and could not be accessed safely for inspection of water margin and aquatic species. This information has been used to inform a professional opinion regarding likely vegetation communities, and to assess the current ecological status of the LWS.

2.3.11 Eleven locations within Land Areas D and F were selected for surveys to be undertaken to provide a sample of the arable habitats on the Land Areas and to identify if any notable arable (non-crop) plants were present. The quantity of arable weeds varied greatly from field to field, and therefore the DAFOR estimates can be used for comparisons within each field but not between fields. Locations are shown as Arable Plant Surveys Target Notes in **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and **Appendix A of this report**.

Notable Plants – Aquatic

2.3.12 The field surveys of the drains and watercourses were undertaken by RSK from 20 to 22 August 2024, by Staff No. RF33 (BSc. (Hons) MCIEEM), who holds a level 4 FISC. Surveys included subjective estimates of their relative abundance on the DAFOR scale (D-dominant, A – abundant, F – frequent, O – occasional, R – rare, prefix V – very, prefix L – local), and a description of the character of the Site. Surveys were undertaken from the top of the banks, with the aid of a grapple, so accurate identification of some plants was not possible. The majority of the information regarding habitats was collected during the UKHab survey, as detailed above.

2.3.13 Additional sample points located throughout the Order Limits, at locations where watercourses are likely to be directly impacted. Sample point locations are shown as Aquatic Plant Survey Target Notes in **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and **Appendix A of this report**.

2.4 Protected and notable animals

General

2.4.1 The habitat within the Order Limits was assessed for its suitability to support protected or otherwise notable animals that are likely to occur in the area. Taking into account the results of the BDS, the geographic location, connectivity to natural habitats in the wider landscape, the nature and extent of habitats within the Order Limits, and the Proposed Development, specific assessment was also carried out for the species/species groups outlined in the following sections.

Invertebrates

2.4.2 The habitat within the Order Limits was assessed for its suitability to support notable species and/or assemblage of invertebrates, but no specific surveys were undertaken. The habitat requirements of particular invertebrates are often species-specific, so consideration was given to the presence of features and habitats that might be suitable for the notable species identified in the BDS.

Fish

2.4.3 Waterbodies/watercourses within/adjacent to the Order Limits were broadly assessed for their likely habitat and water quality, and consequent suitability to support fish (and other species); however, no specific fish surveys were undertaken.

Great crested newts

2.4.4 Although standing water is essential for their breeding, great crested newts (*Triturus cristatus*) are terrestrial for most of the year and have been recorded up to 500m from their breeding ponds. Ordnance Survey maps and aerial imagery were reviewed to identify any ponds within 500m of the Order Limits, and the habitat within the Order Limits was assessed for its suitability for both terrestrial and breeding great crested newts. Optimal breeding ponds tend to be well-vegetated, relatively clean and unpolluted, free of fish and wildfowl, and retentive of water throughout most summers (but not necessarily all). Highly suitable terrestrial habitats include woodland, scrub and tussocky grassland, although great crested newts can be found in a broad range of sub-optimal habitats as well. Habitat suitability for other amphibians was similarly assessed.

Habitat Suitability Index (HSI)

2.4.5 The locations of ponds were identified using OS maps, aerial imagery and site visits. Their assessment of suitability for great crested newts was carried out using a Habitat Suitability Index (HSI) developed by Oldham *et al.* (2000). It is a numerical index, between 0 and 1, where 0 indicates unsuitable habitat and 1 represents optimal habitat.

2.4.6 There is a positive correlation between HSI scores and presence and abundance of great crested newts in ponds. Generally, ponds with high HSI scores are likely to support larger populations. However, the relationship is not sufficiently precise to conclude that a pond with a high HSI will have a large great crested newt population, or that a pond with a low HSI score will only have a small newt population or no newts at all.

2.4.7 Environmental DNA (eDNA) surveys for great crested newts were completed in addition to HSI assessments where ponds and ditches were identified as suitable for this sampling method. This requires a suitable depth of water of reasonable quality to allow sample extraction without undue disturbance to

sediments or submerged vegetation which can lead to contamination of the sample resulting in indeterminate results.

Environmental DNA Sampling

2.4.8 eDNA sampling investigates whether great crested newts have been in a pond by analysing the water for their DNA (which can be shed in skin secretions, excrement, etc.). Using kits from approved suppliers, 20 samples were taken from each of the three ponds and 11 ditches using strict protocols (Biggs *et al.* 2014) approved by Natural England.

2.4.9 Subject to safety of access, sample spacing was regular, except in so far as it targeted aquatic vegetation that might be used for egg-laying. The 20 samples from each pond were collected into a single sample bag and gently homogenized, after which six sub-samples were preserved in an ethanol-based preservative and sent to the laboratory for analysis.

Reptiles

2.4.10 The habitat within the Order Limits was assessed for its suitability for the four most widespread reptile species, with particular attention given to those features that provide suitable basking areas (*e.g.* south-facing slopes), hibernation sites (*e.g.* banks, walls, piles of rotting vegetation) and opportunities for foraging (*e.g.* rough grassland and scrub).

2.4.11 Specific habitat requirements differ between species. Common lizards (*Zootoca vivipara*) and slow-worms (*Anguis fragilis*) favour rough grassland. Grass snakes (*Natrix helvetica*) have broadly similar requirements, with a greater reliance on ponds and wetlands. Adders (*Vipera berus*) use a range of fairly open habitats with some cover but are most often found in dry heath.

Birds

2.4.12 Birds nest, forage and roost in a wide variety of habitats including scrub, woodland, hedgerows and trees, wetland, arable and pastoral farmland and rough grassland. Some species also use open bare ground and man-made structures.

2.4.13 The habitat within the Order Limits was assessed for its suitability to support diverse assemblages and/or uncommon species of breeding and non-breeding birds, with an emphasis on those species that are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), the red and amber lists of the Birds of Conservation Concern 5 (Stanbury *et al.,* 2021) and other notable species recorded in the BDS, including any species that are qualifying features of nearby designated sites. Consideration was given to the Order Limits connectivity to landscape features that are likely to be of particular importance to birds, such as extensive areas of semi-natural woodland or wetlands. The presence of nests or signs of nest building were recorded, and buildings were surveyed for their suitability for barn owls and other species, with signs including nesting sites, feathers, droppings and pellets.

Bats

2.4.14 Habitats within Land Areas B to F were assessed for their suitability for foraging and commuting bats prior to the publication of the current (4th) edition of best practice guidance (Collins, 2023). While the habitats within the grid connection cable route and interconnecting cable routes followed the latest guidance. Therefore, the PEA survey reported here followed both previous best practice guidance within the 3rd edition (Collins, 2016) and latest guidance within the 4th edition (Collins, 2023).

2.4.15 Trees and man-made structures were noted if they had potential suitability for roosting bats (Collins, 2016, 2023). This involved identifying features that roosting bats may favour (*e.g.* holes, cracks and cavities that might be used as bat access-points or roost sites).

Ground-level tree surveys

2.4.16 A ground level tree assessment (GLTA) of the trees that are due to be directly impacted by the Proposed Development, according to the design plans available at the time of surveying was carried out within the Order Limits.

2.4.17 Trees were surveyed from ground level using binoculars and a high-powered torch. Where possible they were viewed from all elevations. Potential roost features (PRFs) that might be used by roosting bats were described and categorised according to accepted guidelines (Collins, 2023). Each tree was given a category during the ground-level surveys (see **Table 2**) based on its potential for roosting bats. Where a tree had multiple PRFs, it was classified according to the highest PRF value present.

2.4.18 Trees may also be categorised as further assessment required (FAR) if the surveyor's view of the tree is obscured. This can be caused by dense Ivy (*Hedera helix*) covering the trunk or major limbs, trees in full leaf or lack of view of an elevation of the tree, so as to conceal PRF's from view.

Table 2: Categorisation of the suitability of trees for roosting bats (Collins 2023)

Tree category (Potential to support roosting bats)	Description
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRF's are present in the tree.
PRF	A tree with at least one PRF, but the PRF(s) have not been / cannot be assessed for their suitability from ground level.
PRF-I	A tree with PRF(s) only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.

Tree category (Potential to support roosting bats)	Description
PRF-M	A tree with PRF suitable for multiple bats and may therefore by used by a maternity colony.
Confirmed roost	Bats or evidence of bats recorded during the surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

Preliminary roost assessment

2.4.19 Structures within or directly adjacent to the Order Limits were assessed externally for roosting bats, taking account of the following factors that influence the likelihood of bats roosting:

- Surrounding habitat and land use;
- Construction detail;
- Structure condition;
- Internal conditions;
- Potential bat-access points; and
- Number and quality of potential roosting features (PRFs).

2.4.20 The structures were inspected for evidence of bats if access allowed. Evidence of roosting bats includes droppings, urine stains, staining from fur-oils, wear marks, feeding remains, live/dead bats, odour, squeaking and chattering.

2.4.21 Following the survey, the building's potential to support roosting bats was then categorised as defined in **Table 3**, based on guidance from Collins (2023).

Table 3: Categorisation of the suitability of structures for roosting bats (Collins 2023)

Structure category (Potential to support roosting bats)	Description
None	No habitat features likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices / suitable shelter at all ground / underground levels).
Negligible suitability	No obvious habitat features likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.

Structure category (Potential to support roosting bats)	Description
Low suitability	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool / stable hibernation site, but could be used by individual hibernating bats).
Moderate suitability	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely for a roost of high conservation status (with respect to roost type only – the categorisation in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High suitability	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool / stable hibernation site.
Confirmed roost	Bats or evidence of bats recorded during the surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

Water voles and otters

2.4.22 Waterbodies and watercourses at proposed crossing points throughout the Order Limits were assessed to determine whether they were suitable for water voles (*Arvicola amphibius*). Suitable habitats include vegetated earth banks, reed beds, flowing water and wet ditches. Incidental signs of water vole activity, including burrows, feeding platforms, food remains and latrines, were recorded if they were encountered.

2.4.23 Waterbodies and watercourses in addition to adjacent habitats were also assessed for their suitability for otter (*Lutra lutra*) throughout the Order Limits. Otters require clean rivers and associated waterbodies with an abundant, varied supply of food and plenty of bank-side vegetation, offering secluded sites for their holts. Other suitable habitats include reed beds and interconnected ditches and streams. Incidental signs of otter activity, including

holts, foraging signs, paths (runs), footprints and spraints, were recorded if they were encountered.

Badgers

2.4.24 An assessment was carried out to identify areas that might be used by badgers (*Meles meles*) for foraging or sett building within 30 m of all areas potentially affected by works (where access was possible). The area was briefly searched for signs of badgers including setts, foraging signs, paths (runs) and latrines where possible, and the category of sett and levels of activity visible at each sett was recorded.

Other species of Principal Importance

2.4.25 The UK countries of England, Wales, Scotland and Northern Ireland are obliged by their individual laws to maintain lists of species and habitats of principal importance for biodiversity conservation. In England, this obligation derives from the Natural Environment and Rural Communities (NERC) Act 2006. An assessment of the suitability and likelihood of the habitat within the Order Limits supporting such species was made (for example, hedgehog (*Erinaceus europaeus*), brown hare (*Lepus europaeus*)).

2.5 Constraints and limitations

2.5.1 The preliminary appraisal as to whether protected or otherwise notable species might occur within the Order Limits is based on the suitability of habitat, the known distribution of relevant species in the local area (from online sources and desk study), and any signs of the relevant species. Field signs for protected and valuable species are also often difficult to find or are absent from a site. The survey does not therefore constitute a full and definitive survey of any protected species group.

2.5.2 Access was not made to adjacent land without access permission, and therefore it remains possible that a badger sett (or other evidence of protected or notable species) beyond the Order Limits could have been missed.

2.5.3 Due to access limitations and health and safety concerns, it was not possible to survey all ditches within the Order Limits and surrounding 250m buffer, but an effort was made to survey those deemed most suitable to support GCN.

2.5.4 Access to all sections of the grid connection cable route was not granted. Areas where access was not possible are indicated as **Target Notes TN43** to **TN49** in **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and **Appendix A of this report**Figure 2. Where access was not possible habitats present were recorded with the aid of aerial photographs.

2.5.5 It is possible that some woodland herb species were absent from the surveys, as they were conducted later in the season.

2.5.6 None of the limitations identified are considered to have reduced the robustness of the survey data collected and the baseline is considered reliable to inform the assessment of the predicted impacts of the Proposed Development, as set out in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

3.0 RESULTS

3.1 Background Data Search

Strategic Significance

Formal local biodiversity action plans and strategies

3.1.1 The East Riding of Yorkshire local biodiversity action plan (East Riding of Yorkshire Council, 2010) lists the following habitats as local formal targets: rivers, standing open water and canals, ponds, arable farmland, hedgerows, traditional orchards, woodland, lowland heathland and acid grassland, chalk grassland, neutral grassland, coastal and floodplain grazing marsh, fen, marsh and swamp, reedbed, maritime cliff and slopes, and saline lagoons.

Informal strategies to identify ecologically desirable areas

3.1.2 The south-east corner of Field B6 is within a Network Enhancement Zone 1 (Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat due to the presence of a nearby orchard).

3.1.3 The grid connection cable route and interconnecting cables are not within an area that has been identified as ecologically desirable by the informal strategies and datasets searched.

International statutory designated sites

3.1.4 There are five international statutory designated sites within 10km of the Land Areas and four sites within 10km of the grid connection cable route, all listed in **Table 4** along with their proximity to the Order Limits and a brief description of their reason for designation. The locations are shown on **Figure 4a**.

Table 4: Internationally designated sites within 10 km of the Order Limits

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
Hornsea Mere	SPA	7,000m
Qualifying Features / Reason for Designation The only remaining mere in Holderness, Humberside and only major freshwater body for wintering ducks in a wide area. It consists of a large, shallow, eutrophic lake of 120ha with associated fen, carr woodland and reedswamp. It is designated for regularly supporting internationally important wintering populations of gadwall (*Anas strepera*) and a nationally important population of mute swan (*Cygnus olor*). Wintering populations of goldeneye (*Bucephala clangula*), pochard (*Aythya farina*), shoveler (*Anas clypeata*) and tufted duck (*Aythya fuligula*) are also mentioned.		

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
Humber Estuary	SPA	8,000m
Qualifying Features / Reason for Designation The Humber Estuary is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. The range of habitats on the Estuary support a large variety of wintering, passage and breeding birds, including internationally important populations of a number of species. Birds are widely distributed throughout the site. Adjacent inland terrestrial sites areas are used extensively as high tide roosts and also provide important supporting habitats for SPA bird species. The qualifying species are: Breeding and non-breeding: Great bittern (*Botaurus stellaris*), Pied avocet (*Recurvirostra avosetta*) Breeding: Eurasian marsh harrier (*Circus aeruginosus*), Little tern (*Sterna albifrons*) Non-breeding: Common shelduck (*Tadorna tadorna*), Hen harrier (*Circus cyaneus*), European golden plover (*Pluvialis apricaria*), Red knot (*Calidris canutus*), Dunlin (*Calidris alpina alpina*), Ruff (*Philomachus pugnax*), Black-tailed godwit (*Limosa limosa islandica*), Bar-tailed godwit (*Limosa lapponica*), Common redshank (*Tringa totanus*)		
Humber Estuary	Ramsar site	8,000km
Qualifying Features / Reason for Designation An estuary with a maximum 7.4 m tidal range exposing vast mud and sand flats at low tide. Vegetation includes extensive reedbeds, areas of mature and developing saltmarsh, backed by grazing marsh or low sand dunes with marshy slacks and brackish pools. The area regularly supports internationally important numbers of various species of breeding and wintering waterbirds. Many passage birds, notably internationally important populations of ringed plover (*Charadriu hiaticula*), and sanderling (*Caldris alba*) stage in the area. The site supports Britain's most southeasterly breeding colony of grey seal (*Halichoerus grypus*).		
Humber Estuary	SAC	8,000km
Qualifying Features / Reason for Designation The Humber Estuary is a large estuary with a high tidal range (macro-tidal). The high suspended sediment loads in the estuary feed a dynamic and rapidly changing system of accreting and eroding intertidal and sub-tidal mudflats and sandflats as well as saltmarsh and reedbeds. Other notable habitats include a range of sand dune types in the outer estuary, together with sub-tidal sandbanks and coastal lagoons. A number of developing managed realignment sites on the estuary also contribute to the wide variety of estuarine and wetland habitats.		

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion. As salinity declines upstream tidal reedbeds and brackish saltmarsh communities fringe the estuary. Significant fish species include river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) which migrate through the estuary to breed in the rivers of the Humber catchment. Grey seals come ashore in autumn to form large breeding colonies.		
Greater Wash	SPA	11,000km
Qualifying Features / Reason for Designation The Greater Wash SPA was designated in 2018 to protect important areas of sea used by waterbirds during the non-breeding period, and for foraging in the breeding season. This site is designated for three non-breeding species: red-throated diver (*Gavia stellata*), little gull (*Hydrocoloeus minutus*) and common scoter (*Melanitta nigra*). The SPA provides important habitat for these species including shallow sandbanks and other sandy substrates. This site is also designated for three breeding tern species: sandwich tern *(Sterna sandvicencis)*, little tern *(Sternula albifrons)* and common tern *(Sterna hirundo)*. During the breeding season populations of all three of these tern species forage within the Greater Wash SPA.		

National statutory designated sites

3.1.5 There is one national statutory designated site within 2km of the Land Areas and one site within 2km of the grid connection cable route, listed in **Table 5** and shown in **Figure 4b**.

Table 5: Nationally designated sites within 2km of the Order Limits

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
Beverley Parks	LNR	280m
The site is also known as Millennium Orchard, Beverley Park. The site has four parts with a mixed broadleaved woodland, an orchard and two fields. It includes the largest recently planted non-commercial orchard of traditional northern apple varieties. The two fields are being restored as traditional parkland as the area was originally an ancient deer park.		
Leven Canal	SSSI	1,190m
Qualifying Features / Reason for Designation The 5 km length of the Leven Canal was cut in 1802 across the marshes and meres of the Hull valley. Following drainage of surrounding marshland, it provided a refuge for wetland plants and now supports an important remnant of this once much more widespread vegetation. The Canal is fed by		

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
calcareous springs supplying water of a very high quality. The canal sides and banks show a zonation of emergent fen species, and there is a wide range of aquatic plant species. The condition of the site is listed as 'unfavourable – no change'.		

Non-Statutory Sites

3.1.6 There are four non-statutory designated sites, all local wildlife sites (LWSs), within 1 km of the Land Areas (not including six 'deleted LWSs' which no longer meet the criteria for the designation and, therefore, are not listed here) and one site within 1 km of the grid connection cable route (not including seven 'deleted LWSs'). The designated sites present within the study area are listed in **Table 6** along with their proximity to the Order Limits and a brief description of their reason for designation. The locations are also shown in **Figure 4b**.

Table 6: Non-statutory designated sites within 1 km of the Order Limits

Site Name	Designation	Distance (m) from the closest edge of the Order Limits
Meaux	LWS	Directly abuts the Order Limits
Qualifying Features / Reason for Designation A linear verge (semi-improved grassland) and a hedgerow of approximately 1500m along the minor road between Wawne and Routh, adjacent to the remnant earthworks of Meaux Abbey. On the eastern side of the road, at the northern end, there is a small area of semi-natural broadleaved woodland, which is integral to the site.		
Arnold Drain	LWS	50m
Qualifying Features / Reason for Designation An interesting road verge comprising a variety of species in an otherwise arable landscape.		
Figham Pastures	LWS	Within the Order Limits
Qualifying Features / Reason for Designation A good mixed habitat site containing higher floristic diversity in the drains and dykes that intersect the site. Comprises mosaics of semi-improved, neutral, cattle-grazed, pasture with marshy grassland, extensive areas of rush pasture, and two drainage systems running north-south through the site.		
Cote Wood	LWS	Directly abuts the Order Limits
Qualifying Features / Reason for Designation Ancient, semi-natural woodland with Ash (*Fraxinus excelsior*), scattered old Pedunculate Oak (*Quercus robur*) and an area of ancient Hazel (*Corylus avellana*) coppice. **Target Note 24**.		

Notable habitats

3.1.7 There is one area of ancient semi-natural woodland within 1 km of the Order Limits, namely Cote Wood (LWS) that is along the edge of Land Area D.

3.1.8 Other priority habitats which are ostensibly on or adjacent to the Order Limits according to MAGIC maps (www.magic.defra.gov.uk) include areas of priority deciduous woodland (in Land Areas E, H, grid connection cable route and interconnecting cable routes) and areas of floodplain grazing marsh within the grid connection cable route, namely within Figham Pastures LWS and to the south-west of the Land Areas SSSI impact risk zones.

3.1.9 The Land Areas and interconnecting cable routes intersect 30 SSSI Impact Risk Zone buffers and the grid connection cable route interacts with eight (with constraints varying across the Order Limits). Natural England has been consulted in relation to the Proposed Development.

Protected and Notable Species

3.1.10 There are records of at least 11 protected species within 1 km of the Land Areas and interconnecting cable routes (**Table 8**, **Appendix C**). These include, grass snake, at least three species of bat, badger, water vole and three species of bird.

3.1.11 At least 23 additional noteworthy species are recorded from places within 1 km of the Land Areas and interconnecting cable routes (**Table 9, Appendix C**), of these:

- 2 are very common amphibians – common toad (*Bufo bufo*) and common frog (*Rana temporaria*);
- 11 are birds;
- 1 is a fish – European eel (*Anguilla anguilla*);
- 1 is an invertebrate – white-letter hairstreak (*Satyrium w-album*);
- 1 is a lichen – *Xanthoria ucrainica;*
- 1 is a mammal – western European hedgehog (*Erinaceus europaeus*); and
- 6 are plants.

3.1.12 There are records of at least 16 protected species within 1 km of the grid connection cable route (**Table 10, Appendix C**). These include grass snake, at least four species of bat, badger, water vole, otter and six species of bird.

3.1.13 At least 29 additional noteworthy species are recorded from places within 1 km of the grid connection cable route (**Table 11, Appendix C**), of these:

- 3 are very common amphibians – common toad (*Bufo bufo*), common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*);
- 14 are birds;
- 1 is a fish – European eel (*Anguilla anguilla*);

- 2 are mammals – western European hedgehog (*Erinaceus europaeus*) and brown hare (*Lepus europaeus*); and
- 9 are plants.

3.1.14 Noteworthy species include species of principal importance that are listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006. Those of relevance to the Order Limits and the current proposals are discussed in **Sections 4.2** and **4.3**.

3.2 Plants and habitats

UKHab survey

3.2.1 The UKHab habitat map is provided in **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and shows the location of the target notes referred to in the text below. A full description for each of the target notes is given in **Appendix A**. The Order Limits comprises the following habitats (with UKHab codes in brackets):

- Cropland (c1)
- Modified grassland (g4)
- Other neutral grassland (g3c)
- Woodland (w)
- Line of trees (w1 – 33 & 34)
- Hedgerows (h2)
- Dense scrub (h3)
- Other standing water (r1g)
- Other rivers and streams (r2b)
- Aquatic Marginal vegetation (f2d)
- Built-up areas and gardens (u1)

Cropland (c1)

Land Areas

3.2.2 The vast majority of the Land Areas are arable land which at the time of the survey was a mix of cereal crops (c1c), non-cereal crops (such as beans) (c1d), and three temporary grass and clover leys (c1b). The leys were dominated by the agricultural grass *Lolium perenne* (Perennial Rye-grass), with or without *Trifolium repens* (White Clover) and *Phleum pratense* (Timothy). As the fields were all intensively farmed, common arable weeds, where present, were mostly limited to the corners or very edges of the fields, with the exception of two small fields where fir saplings (*Abies* species) were

being grown (**Target Notes 13** and **32**) and two fields which appeared to have been left fallow (**Target Notes 12** and **22**).

3.2.3 The most frequent weeds included the grass *Alopecurus myosuroides* (Black-grass) together with annuals mostly *Capsella bursa-pastoris* (Shepherd's-purse), *Sonchus asper* (Prickly Sow-thistle), *Tripleurospermum inodorum* (Scentless Mayweed) and *Papaver rhoeas* (Common Poppy) and *Veronica persica* (Common Field-speedwell) together with smaller amounts of *Aethusa cynapium* (Fool's Parsley), *Euphorbia helioscopia* (Sun Spurge) and *Sherardia arvensis* (Field Madder). There were also the occasional tall biennial or perennial species such as *Anthriscus sylvestris* (Cow Parsley), *Plantago major* (Greater Plantain) and *Sonchus arvensis* (Perennial Sow-thistle).

3.2.4 There were also six cultivated arable field margins (c1a), mainly towards the south of the Land Areas. Most were dominated by seeded mixes of flowers, mostly *Cichorium intybus* (Chicory) and together with *Centaurea cyanus* (Cornflower), *Daucus carota* ssp. *carota* (Wild Carrot) and *Lotus corniculatus ssp. Sativus* (Common Bird's-foot-trefoil), the non-native *Phacelia tanacetifolia* (Phacelia) and a variety of agricultural clovers including *Trifolium hybridum* (Alsike Clover), *Trifolium incarnatum* ssp. *incarnatum* (Crimson Clover), *Trifolium pratense* (Red Clover) and *Trifolium repens* (White Clover). There were also coarse grasses including *Dactylis glomerata* (Cock's-foot) and *Holcus lanatus* (Yorkshire-fog), ruderal perennials such *Cirsium arvense* (Creeping Thistle) and *Sonchus arvensis* (Perennial Sow-thistle), and a variety of common weeds of cultivation including *Helminthotheca echioides* (Bristly Oxtongue), *Sonchus asper* (Prickly Sow-thistle) and *Persicaria maculosa* (Redshank). Only one of these margins was remotely species-rich (**Target Note 21; Plate 1**).

Plate 1 – Cultivated arable field margin (Target Note 21)

Cable Routes

3.2.5 Cropland is also present within the interconnecting cable routes and the grid connection cable route. Most of these areas contain cereal crops (c1c), with some non-cereal crops (legumes and potatoes) (c1d), fallow fields (c1 - 604) and ploughed fields (c1 - 600) present. In most of these areas, the arable fields have been cultivated to the edge of the field leaving a narrow field margin of up to 1 m, however wider arable field margins (c1a) are present in some of the fields.

3.2.6 The Cable B-B area includes a section of arable field margin sown with pollen and nectar-rich plants (c1a6) (**Plate 2**). Species include annual weeds typical of cultivation such as *Lamium purpureum* (Red Dead-nettle), *Senecio vulgaris* (Groundsel), *Sonchus asper*, *Tripleurospermum inodorum* (Scentless Mayweed) and *Veronica* species (a speedwell) together with native and non-native species typical of wildflower seed mixes such as *Centaurea cyanus* (Cornflower), *Chamaemelum nobile* (Chamomile), *Glebionis segetum* (Corn Marigold), *Papaver rhoeas* (Common Poppy), *Phacelia tanacetifolia* (Phacelia) and *Trifolium repens* (White Clover).

3.2.7 The Cable E-E area includes a section of temporary grass and clover leys (c1b). Species include the grasses *Agrostis capillaris* (Common Bent), *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue) and *Lolium perenne* (Perennial Rye-grass) together with some tall ruderals such as *Cirsium arvense* (Creeping Thistle), *Cirsium vulgare* (Spear Thistle) and *Epilobium* species (willowherbs) and species derived from a seed-mix including *Echium plantagineum* (Viper's-bugloss), *Lotus corniculatus* var. *sativus* (Common Bird's-foot-trefoil), *Malva moschata* (Musk Mallow), *Trifolium pratense* (Red Clover) and *Poterium sanguisorba* ssp. *balearicum* (Fodder Burnet).

3.2.8 Some of the cropland in the grid connection cable route contains tussocky arable field margins (c1a5) and arable field margins cultivated annually (c1a7). Tussocky arable field margins have been allowed to develop for a longer time and contain little bare ground with the grass *Avena fatua* (Wild-oat) together with annuals such as *Chamaemelum nobile* (Chamomile), *Epilobium* species (willowherbs), *Geranium* species (cranesbills), *Persicaria maculosa* (Redshank) and *Polygonum aviculare* (Knotgrass). Taller ruderals are conspicuous including *Cirsium arvense* (Creeping Thistle), *Cirsium vulgare* (Spear Thistle) and *Urtica dioica* (Common Nettle).

3.2.9 Arable field margins cultivated annually are mostly associated with a previous cable project in the region which is located within the grid connection cable route (Dogger Bank cable route) and comprise large areas of bare ground with species typical of trampled and disturbed ground such as *Matricaria discoidea* (Pineappleweed) and *Persicaria maculosa* (Redshank) together with taller *Matricaria chamomilla* (Scented Mayweed), *Papaver rhoeas* (Common Poppy), *Phacelia tanacetifolia* (Phacelia) and *Tripleurospermum inodorum* (Scentless Mayweed). The grid connection cable route also includes a fallow field where a cable for Dogger Bank Wind Farm has previously been installed

and contains a similar species composition to the annually cultivated arable field margin habitat but contains less bare ground.

Plate 2 – Arable field margin sown with pollen and nectar

Rare arable plants

3.2.10 A species list, and relative abundance of the plants recorded at locations marked as Arable plant survey target notes **TN1** to **TN11** on **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and **Appendix A of this report**., are included in **Table 13** in **Appendix F**.

3.2.11 The assemblages of plants were very similar in the survey area, the different locations do not have significantly different weed floras. Two species were notable, listed as 'vulnerable' on the England red list (Stroh et al. 2014):

- *Bromus secalinus* (Rye Brome) was noted as an uncommon species in the background data search for the survey area. Today it is a widespread and common species, both as an arable weed and in other situations, and its presence does not therefore have any real nature conservation significance.
- *Silene noctiflora* (Night-flowering Catchfly) is a declining arable weed though frequent on the Yorkshire Wolds according to Crackles (1990). A single plant was found in a cover crop, but it is probably safe to assume that it was a natural occurrence (as opposed to an inclusion in the seed mix). It is less common in other parts of V.C.61.

3.2.12 Overall, therefore the survey area appears to contain ordinary arable-weed flora, with very few notable species of modest note as would be expected in any sufficiently large survey.

Modified grassland (g4)

Land Areas

3.2.13 There are several fields of modified grassland in the Land Areas. All are dominated by *Lolium perenne* (Perennial Rye-grass) but they varied in species-richness. Some appeared to be grazed, long-term leys with few other species other than the annual *Capsella bursa-pastoris* (Shepherd's-purse) and perennials *Plantago major* (Greater Plantain), *Taraxacum* sect. *Ruderalia* (Common Dandelion) and *Trifolium repens* (White Clover). Others had a slightly greater diversity of species but had recently been cut for silage and also included the grasses *Phleum pratense* (Timothy), *Holcus lanatus* (Yorkshire-fog), *Dactylis glomerata* (Cock's-foot), and a variety of tall semi-ruderals such as *Cirsium arvense* (Creeping Thistle), *Cirsium vulgare* (Spear Thistle) and *Rumex crispus* (Curled Dock).

3.2.14 However, at least two fields were slightly more diverse despite still being dominated by *Lolium perenne* (Perennial Rye-grass) and other productive grasses. One included *Agrostis capillaris* (Common Bent) and *Festuca rubra* (Red Fescue) and the other (**Target Note 8; Plate 3**) had an area with up to eight or nine species/m^2. This area of the field frequently included the grass *Festuca rubra* (Red Fescue) with *Ranunculus acris* (Meadow Buttercup) and smaller amounts of native variety of grassland herbs, which seem to be naturally occurring varieties rather than derived from seed-mix, including *Galium verum* (Lady's Bedstraw), *Trifolium dubium* (Lesser Trefoil), *Lathyrus pratensis* (Meadow Vetchling), *Lotus corniculatus* (Common Bird's-foot-trefoil) and *Rumex acetosa* (Common Sorrel).

3.2.15 All other areas of modified grassland in the Land Areas are present as 2-4 m wide strips along the margins of fields and used as tracks for farm machinery. Perennial Rye-grass is usually dominant in these areas with other species dependent on the levels of mowing or disturbance. Shorter grassland frequently includes common grassland herbs such as *Plantago major* (Greater Plantain), Trifolium *repens* (White Clover) and *Taraxacum* sect. *Ruderalia* (Common Dandelion) with annual *Capsella bursa-pastoris* (Shepherd's-purse). In places, there is the parasitic plant *Odontites vernus* (Red Bartsia), which is typical of disturbed, grassy places. In longer areas, there are the coarse grasses *Bromus hordeaceus* (Soft-brome), Dactylis *glomerata* (Cock's-foot), tall semi-ruderals such as *Heracleum sphondylium* (Hogweed) and Urtica dioica (Common Nettle) as well as some *Plantago lanceolata* (Ribwort Plantain) as the grassland grades into neutral grassland dominated by *Arrhenatherum elatius* (False Oat-grass) surrounding most ditches and hedges.

Plate 3 – Less improved modified grassland field

Cable Routes

3.2.16 Areas of modified grassland in the interconnecting cable routes include narrow field margins between cropland and watercourses/hedgerows, narrow roadside verges and a section of improved grassland that does not appear to be recently grazed. Commonly encountered species include the grasses *Lolium perenne* (Perennial Rye-grass) with *Dactylis glomerata* (Cock's-foot), *Festuca rubra* (Red Fescue) and *Holcus lanatus* (Yorkshire-fog), together with tall semi-ruderals such as *Cirsium vulgare* (Spear Thistle), *Heracleum sphondylium* (Hogweed), *Plantago major* (Greater Plantain) and Creeping Buttercup (*Ranunculus repens*).

3.2.17 There are several fields of modified grassland along the grid connection cable route, predominantly comprising cattle, sheep and horse-grazed fields. There are also several fields of modified grassland that do not appear to be currently grazed or have been unmanaged for some time and have developed a taller sward with semi-ruderal species such as *Cirsium arvense* (Creeping Thistle) and *Rumex crispus* (Curled Dock). The majority of these fields were surveyed from a distance due to livestock or difficulty of access.

3.2.18 Figham Pastures LWS in the north of the grid connection cable route contains mostly short-sward grassland that has been heavily grazed by cattle and horses, with patches of thistles, scattered bushes of *Crataegus monogyna* (Hawthorn) and areas of bare ground as a result of poaching by livestock (**Plate 4**).

Plate 4 – Cattle and horse-grazed field at Figham Pastures LWS

Other neutral grassland (g3c)

Land Areas

3.2.19 There are only two significant areas of neutral grassland within the Land Areas, with most other areas found along the margins of fields along ditches and hedgerows.

3.2.20 One of the areas (**Target Note 10; Plate 5**) is a strip of sown grassland with grasses including Agrostis *stolonifera* (Creeping Bent), *Arrhenatherum elatius* (False Oat-grass), *Cynosurus cristatus* (Crested Dog's-tail) and *Holcus lanatus* (Yorkshire-fog). Grassland herbs include conspicuous *Centaurea nigra* (Common Knapweed) and *Galium verum* (Lady's Bedstraw) together with the tall semi-ruderal *Cirsium arvense* (Creeping Thistle).

3.2.21 The other area (**Target Note 31**) is a small field with tall, rank, species-poor grassland. The grassland appeared to be maintained for pheasants (*Phasianus colchicus*) which were being reared within an enclosure in the field. The coarse grass *Dactylis glomerata* (Cock's-foot) is dominant with frequent tall semi-ruderal species including *Cirsium vulgare* (Spear Thistle), *Jacobaea vulgaris* (Common Ragwort) and *Rumex obtusifolius* (Broad-leaved Dock. The tall grass *Phalaris arundinacea* (Reed Canary-grass) and seeded *Cichorium intybus* (Chicory) extend from the grassland into the cultivated field margins.

3.2.22 All of the other areas of neutral grassland are along the margins of fields, merging into ditches and hedgerows. Most are relatively narrow (2–4 m wide) and none were particularly species-rich (mostly around 4–9 species/m^2), generally being dominated by *Arrhenatherum elatius* (False Oat-grass) and a few other very common grasses and forbs. Most appeared to be infrequently

mown, though many have scattered scrub, mainly *Rubus fruticosus* agg. (Bramble).

3.2.23 The most species-poor areas generally had a greater abundance of the ruderal grass *Elymus repens* (Common Couch) together with the tall semi-ruderals *Cirsium arvense* (Creeping Thistle) and *Urtica dioica* (Common Nettle). The less rank areas occasionally support grassland species such as *Centaurea nigra* (Common Knapweed), *Cruciata laevipes* (Crosswort), *Lathyrus pratensis* (Meadow Vetchling) and *Vicia cracca* (Tufted Vetch). Much more rarely, and only on the banks of ditches, the grassland is more open and less species-poor with the calcicole *Linum catharticum* (Fairy Flax), found in one area (**Target Note 15**). Frequently, species from the ditches also merge in with the surrounding grassland, mainly the grasses *Phragmites australis* (Common Reed), *Phalaris arundinacea* (Reed Canary-grass) and the tall herb *Epilobium hirsutum* (Great Willowherb).

Plate 5 – Wide strip of sown, moderately species-rich grassland (Target Note 10)

Cable Routes

3.2.24 There is limited other neutral grassland habitat recorded within the interconnecting cable routes and this habitat is predominantly limited to roadside verges, vegetated banks of ditches and drains, and narrow uncultivated field margins. The largest area of other neutral grassland is a 0.33 ha field of unmanaged, tall-sward grassland in the north of the Cable C-F area. Species include the grasses *Agrostis capillaris* (Common Bent), *Dactylis glomerata* (Cock's-foot), *Festuca rubra* (Red Fescue) and *Holcus lanatus* (Yorkshire-fog) together with meadow species such as *Lathyrus pratensis* (Meadow Vetchling), *Jacobaea vulgaris* (Common Ragwort), Meadowsweet (*Filipendula ulmaria*), *Ranunculus repens* (Creeping Buttercup), *Rumex acetosa* (Common Sorrel), the semi-ruderals including *Dipsacus fullonum*

(Teasel), *Helminthotheca echioides* (Bristly Oxtongue), *Lamium purpureum* (Red Dead-nettle), *Rumex crispus* (Curled Dock) and willowherbs (*Epilobium* species).

3.2.25 The Cable C-F area lies adjacent to Arnold Drain LWS which includes roadside verges in addition to Arnold and Riston Drain (**Target Note 50**). A narrow margin of other neutral grassland is present along the west of the road and a full species list is provided in **Appendix F**.

3.2.26 The Cable B-B area includes unmanaged other neutral grassland roadside verges along the A165 (**Plate 6**). The verges have a varied sward height and include the grasses *Dactylis glomerata* (Cock's-foot), *Bromus hordeaceus* (Soft-brome) and *Lolium perenne* (Perennial Rye-grass), together with tall perennials and biennials such as *Anthriscus sylvestris* (Cow Parsley), *Arctium minus* (Lesser Burdock), *Cirsium arvense* (Creeping Thistle), *Heracleum sphondylium* (Hogweed), *Malva sylvestris* (Common Mallow), *Rumex crispus* (Curled Dock), *Sonchus arvensis* (Perennial Sow-thistle) and *Urtica dioica* (Common Nettle). Broad-leaved grassland herbs include *Achillea millefolium* (Yarrow), *Centaurea nigra* (Common Knapweed), *Argentina anserina* (Silverweed), *Plantago lanceolata* (Ribwort Plantain), *Potentilla reptans* (Creeping Cinquefoil), *Trifolium pratense* (Red Clover) and *Ranunculus repens* (Creeping Buttercup). There is a line of mature *Fraxinus excelsior* (Ash) and *Acer campestre* (Field Maple) trees along a section of the verge and the grassland in this area is shorter and less diverse. Scattered *Crataegus monogyna* (Hawthorn) and *Corylus avellana* (Hazel) scrub is present in the understorey and the woodland herb *Arum maculatum* (Lords-and-Ladies) was also recorded.

3.2.27 There are few areas of other neutral grassland within the grid connection cable route. An area of this habitat was recorded along a public right of way at the edge of a crop field in the south near the National Grid Creyke Beck Substation. The sward is tall, unmanaged and species include the coarse grasses *Agrostis capillaris* (Common Bent), *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog) and *Lolium perenne* (Perennial Rye-grass) together with tall semi-ruderals such as thistles, docks and nettles, *Anthriscus sylvestris* (Cow Parsley), *Epilobium hirsutum* (Great Willowherb), *Heracleum sphondylium* (Hogweed), *Jacobaea vulgaris* (Common Ragwort), *Sonchus arvensis* (Perennial Sow-thistle) and *Plantago lanceolata* (Ribwort Plantain). Near the field entrance there were young scattered saplings of a variety of woody species that have self-seeded from the adjacent woodland.

3.2.28 Other neutral grassland was also recorded along the eastern bank of the River Hull, comprising the grasses *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog) and *Lolium perenne* (Perennial Rye-grass) together with tall semi-ruderal herbs such as *Anthriscus sylvestris* (Cow Parsley), *Jacobaea vulgaris* (Common Ragwort) and smaller grassland forbs such as *Lathyrus pratensis* (Meadow Vetchling), *Trifolium pratense* (Red Clover) and plantains. Tall waterside species grow in the wetter soils on the lower bank and include *Epilobium hirsutum* (Great Willowherb) and *Filipendula ulmaria* (Meadowsweet).

Plate 6 – Other neutral grassland road verge along A165

Woodland (w)

Land Areas

3.2.29 There are eight areas of woodland within the Land Areas (**Target Notes 3, 7, 11, 18-20 and 24, 25**). Five of these (**Target Note 3, 7, 11, 19 and 24**) are not considered a habitat of principal importance listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006, mainly because they are either very young (**e.g. Target Note 11**), dominated by Sycamore and other non-native species (**e.g. Target Notes 3 and 19**) or just very small areas in the corners of fields (**e.g. Target Notes 7 and 25**). One area (**Target Note 20**) does have a few mature *Quercus robur* (Pedunculate Oak) trees and semi-mature *Fraxinus excelsior* (Ash), though the rest is dominated by young, planted trees. None of the areas have a species-rich ground flora, and are usually dominated by a mix of nettlebed species including, Cleavers (*Galium aparine*), *Heracleum sphondylium* (Hogweed) and *Urtica dioica* (Common Nettle), together with creeping *Hedera helix* (Ivy) and a small amount of the woodland grass *Brachypodium sylvaticum* (False Brome).

3.2.30 The only area of greater value (**Target Note 18; Plate 7**) is a small wood with young to mature trees of *Quercus robur* (Pedunculate Oak) and *Fraxinus excelsior* (Ash) with a mixed understorey that includes *Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder) and a species of Elm (*Ulmus* species) with saplings of *Alnus glutinosa* (Alder), *Aesculus hippocastanum* (Horse-chestnut) and *Fraxinus excelsior* (Ash). Like the rest of the woodland, the ground flora is dominated by *Urtica dioica* (Common nettle) and *Rubus fruiticosus agg.* (Bramble), though here it does include rare occurrences of the woodland plant *Arum maculatum* (Lords-and-Ladies). The only nearby woodland of more value is the ancient woodland Cote Wood LWS (**Target**

Note 24) which is adjacent to the Land Area D17, though at the other side of a ditch.

Plate 7 – An area of woodland within the Order Limits (Target Note 18).

Cable Routes

3.2.31 There are only two small areas of woodland within the interconnecting cable routes areas (Cable B-B). Riparian other broadleaved woodland (w1g) is present in the Cable B-B area along Stonleygoat Dike. Species include a canopy of *Acer pseudoplatanus* (Sycamore), *Aesculus hippocastanum* (Horse-chestnut), *Fraxinus excelsior* (Ash)*Quercus robur* (Pedunculate Oak) and bushes of *Crataegus monogyna* (Hawthorn). The woodland has been disturbed as a result of farming activities and there are large areas of bare ground. The ground flora is disturbed and is limited to nettlebeds dominated by *Urtica dioica* (Common Nettle) and *Rubus fruticosus* agg. (Bramble) with some *Dactylis glomerata* (Cock's-foot) and *Heracleum sphondylium* (Hogweed). There are also two areas of plantation woodland directly adjacent to Cable C-F and Cable E-F.

3.2.32 There are four areas of woodland (w1g and w1f) within the grid connection cable route. Full access to these areas of woodland was not possible during the survey due to the presence of dense scrub or steep banks, therefore they could only be surveyed from the edge. There are also two areas of woodland directly adjacent to the boundary of the Land Areas.

3.2.33 There are two linear areas of other broadleaved woodland (w1g) along the northern and southern edges of the A1079. The woodland has been planted on a steep bank between cropland the A1079 Road and comprises *Alnus incana* (Grey Alder), *Fraxinus excelsior* (Ash) and *Sorbus aria* (Common Whitebeam) over a dense scrubby understorey of *Cornus sanguinea*

(Dogwood), *Crataegus monogyna* (Hawthorn), *Prunus domestica* (Wild Plum), *Prunus spinosa* (Blackthorn) and *Rubus fruticosus* agg. (Bramble).

3.2.34 There is also an area of other broadleaved woodland in the corner of an arable field south of Long Lane comprising mature trees and scrub. Species include *Acer pseudoplatanus* (Sycamore), *Betula pendula* (Silver Birch), *Quercus robur* (Pedunculate Oak) and *Sambucus nigra* (Elder) together with some conifers. Aerial imagery indicates that a building may be present in a clearing in the centre of the woodland.

3.2.35 In the southwest of the grid connection cable route there is a small area of mature lowland mixed deciduous woodland (w1f) adjacent to Cottingham Caravan and Motorhome Services, just north of Park Lane (**Plate 8**). Species include *Aesculus hippocastanum* (Horse-chestnut), *Fraxinus excelsior* (Ash) and *Ulmus glabra* (Wych Elm) with an understorey of *Acer campestre* (Field Maple), *Salix* species (Willows), *Prunus spinosa* (Blackthorn), *Sambucus nigra* (Elder), *Rubus fruticosus* agg. (Bramble) and *Rosa canina* (Dog-rose). Wanless Beck Drain runs through the middle of the woodland.

Plate 8 – lowland mixed deciduous woodland north of Park Lane

Lines of trees (w1 - 33)

Land Areas

3.2.36 Only five lines of trees were recorded across the Land Areas. To the north of Land Area E is a line of young poplar trees, probably *Populus* cf. × *canadensis* (Hybrid Black-poplar). Along ditches in Land Areas C and D are some young to mature *Fraxinus excelsior* (Ash), *Quercus petraea* (Sessile Oak) and *Quercus robur* (Pedunculate Oak), and in Land Area B, there is a line of semi-mature *Acer pseudoplatanus* (Sycamore). However, also in Land Area B is the most significant line of trees with over 100 trees, some of them mature (**Target Note 4; Plate 8**). Species are mostly *Fraxinus excelsior* (Ash) and

Quercus robur (Pedunculate Oak) with occasional *Aesculus hippocastanum* (Horse-chestnut).

3.2.37 The ground flora under all lines of trees was species-poor, usually with nettlebed vegetation of *Urtica dioica* (Common Nettle) with *Anthriscus sylvestris* (Cow Parsley), *Galium aparine* (Cleavers) and the coarse grass. *Arrhenatherum elatius* (False Oat-grass).

Plate 9 – A section of the longest line of trees within the Land Areas (Target Note 4).

Cable Routes

3.2.38 Within the interconnecting cable routes area, lines of trees are present in Cable B-B only and are predominantly associated with watercourses and ditches. The majority of trees within these habitats are mature and those with veteran features are considered to be ecologically valuable (w1 - 34). Commonly recorded species include *Acer pseudoplatanus* (Sycamore), *Aesculus hippocastanum* (Horse-chestnut), *Fraxinus excelsior* (Ash), *Quercus robur* (Pedunculate Oak) and elms often with a scrubby understorey of *Crataegus monogyna* (Hawthorn) and *Sambucus nigra* (Elder).

3.2.39 Within the grid connection cable route area, lines of trees are found at the boundaries of arable fields and along watercourses. At Figham Pastures LWS, ecologically valuable trees (w1 - 34) were recorded along Beverley and Skidby Drain and Figham Drain. Mature *Aesculus hippocastanum* (Horse-chestnut), with some poplars (*Populus* species) with bushes of *Sambucus nigra* (Elder) are present along Figham Drain, whilst Beverley and Skidby Drain contains predominately mature *Crataegus monogyna* (Hawthorn) with some *Acer pseudoplatanus* (Sycamore), *Aesculus hippocastanum*, poplars and willows.

3.2.40 There is also a line of ecologically valuable (w1 - 34) trees at the boundary between two fields, northwest of Hampston Hill Farm (**Plate 10**). The trees are

at the location of a proposed hedge punch through and comprise several mature willow trees, some with dense *Hedera helix* (Ivy) cover together with some *Crataegus monogyna* (Hawthorn) scrub.

Plate 10 – Line of ecologically valuable mature Crack Willow trees

Native hedgerows (h2a)

Land Areas

3.2.41 Over 150 native hedgerows have been recorded within the Land Areas and are found frequently across all Land Areas. Most are species-poor and are usually dominated by *Crataegus monogyna* (Hawthorn) with a wide variety of other woody species including Prunus *spinosa* (Blackthorn), *Sambucus nigra* (Elder), elms and roses. Other woody species that were recorded in fewer hedges and in smaller amounts include Acer *campestre* (Field Maple), *Cornus sanguinea* (Dogwood), *Corylus avellana* (Hazel), *Daphne laureola* (Spurge-laurel), *Euonymus europaeus* (Spindle), *Prunus avium* (Wild Cherry), *Rhamnus catharticus* (Buckthorn), *Salix caprea* (Goat Willow) and *Salix cinerea* (Grey Willow)). The ground flora is almost exclusively largely dominated by poor nettlebeds with a mix of *Urtica dioica* (Common Nettle) with *Galium aparine* (Cleavers), *Hedera helix* (Ivy) and *Rubus fruticosus* agg. (Bramble). A small number of woodland herbs were recorded, such as *Arum maculatum* (Lords-and-Ladies) and *Mercurialis perennis* (Dog's Mercury).

3.2.42 Around a third of the hedgerows have wet ditches associated with them, often with some wetland and waterside species such as *Epilobium hirsutum* (Great Willowherb) and the grasses *Phalaris arundinacea* (Reed Canary-grass) and *Phragmites australis* (Common Reed). Over a third of the hedgerows also have trees which are mostly young or semi-mature. *Fraxinus excelsior* (Ash) is the most common species, though *Acer pseudoplatanus* (Sycamore) and *Quercus robur* (Pedunculate Oak) are also common. More rarely there are

species such as *Acer campestre* (Field Maple), *Alnus glutinosa* (Alder) and *Sorbus aucuparia* (Rowan).

3.2.43 Only 18 of the hedgerows were recorded as species-rich (which in this part of England means they have at least four native woody species per 30 m section). These species-rich hedgerows tend to be mix of *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) usually also with *Acer campestre* (Field Maple), but otherwise many of the same woody species are present as in the other native hedgerows. Almost all of the species-rich hedgerows are on boundaries of the Land Areas (**e.g. Target Note 27**), though two are well within the Order Limits (**Target Notes 23 and 28**).

3.2.44 Many of the hedgerows are gappy, leggy, or overgrown but all qualify as habitats of principal importance.

Plate 11 – One of the few species-rich hedgerows within the Land Areas (Target Note 23).

Cable Areas

3.2.45 There are numerous native hedgerows (h2a) within the grid connection cable route corridor. Within the interconnecting cable routes area, hedgerows are only present in the Cable B-B area. In line with the results of the Land Areas, the majority of the hedgerows are species-poor (h2a6) and are dominated by *Crataegus monogyna* (Hawthorn) with frequent *Prunus spinosa* (Blackthorn), *Sambucus nigra* (Elder) and the occasional rose species (mostly *Rosa canina* and *Rosa arvensis*). Most of the hedgerows are unmanaged and are overgrown. They often have less than 1 m of undisturbed perennial vegetation at the base and ground flora is dominated by the tall semi-ruderals *Cirsium arvense* (Creeping Thistle), *Heracleum sphondylium* (Hogweed), *Urtica dioica* (Common Nettle) and *Rubus fruticosus* agg. (Bramble).

3.2.46 One hedgerow in the Cable B-B area along the A165 is considered to be species-rich (h2a5) as it contains over four woody species: Crataegus monogyna (Hawthorn), Prunus spinosa (Blackthorn), Sambucus nigra (Elder),

Fraxinus excelsior (Ash), Acer pseudoplatanus (Sycamore) and Rosa canina (Dog-rose) (**Plate 12**).

Plate 12 – Species-rich hedgerow along the A165

Important hedgerows

3.2.47 A total of 19 species rich hedgerows, have been classified as species rich hedgerows during the UKHab surveys, which qualify as important hedgerows, if additional criteria are met under The Hedgerow Regulations 1997, part 2, 'wildlife and landscape criteria for important hedgerow selection'. A further nine hedgerows were assessed as part of the hedgerow survey, to provide a sample of hedgerows that are potentially impacted.

3.2.48 Of those 28 hedgerows that were assessed, 16 hedgerows were potentially important. The hedgerows that were assessed, and those found to be potentially important are shown on **Figure 5**. Details of the assessment results are listed in **Appendix G**.

Dense scrub (h3)

Land Areas

3.2.49 There are several relatively small areas of dense Bramble scrub (h3d), usually along banks of ditches and drains or in neglected corners of fields. They usually occur alongside species-poor grassland dominated by the coarse grass *Arrhenatherum elatius* (False Oat-grass) with *Urtica dioica* (Common Nettle). Occasionally there are woody species including *Crataegus monogyna* (Hawthorn), *Salix cinerea* (Grey Willow), *Sambucus nigra* (Elder) and young *Fraxinus excelsior* (Ash). Tall semi-ruderal herbs include *Cirsium arvense* (Creeping Thistle), *Chamaenerion angustifolium* (Rosebay Willowherb, *Galium aparine* (Cleavers) and scrambling *Calystegia silvatica* (Large Bindweed). There are also several similar areas of mixed scrub (h3h) found in very similar situations, just with *Crataegus monogyna* (Hawthorn), *Sambucus*

nigra (Elder), *Rubus fruticosus* agg. (Bramble) and species of rose (*Rosa* species) having a more equal cover.

3.2.50 However, to the western side of Land Area F (**Target Notes 29 and 30**), there are also two larger, areas of mixed scrub (h3h) planted in the recent past for game cover. There is a wide range of mostly native, but also non-native woody species, and paths of mown, modified grassland cutting through the areas. Species include *Corylus avellana* (Hazel), *Cornus sanguinea* ssp. *australis* (Southern Dogwood), *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Rhamnus catharticus* (Buckthorn), *Rubus fruticosus* agg. (Bramble), *Sorbus aucuparia* (Rowan), *Symphoricarpos albus* (Snowberry) and *Viburnum opulus* (Guelder-rose).

Plate 13 – Area of mixed, planted scrub to the west of Land Area F (Target Note 30).

Cable Areas

3.2.51 Within the interconnecting cable routes area, dense scrub was recorded as linear areas along the banks of watercourses and field boundaries, often where hedgerows have not been managed and are now over 5 m wide. Therefore, the majority of this habitat is mixed scrub (h3h) comprising typical hedgerow species of predominantly *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Rosa canina* (Dog-rose), *Rubus fruticosus* agg. (Bramble), *Salix* species (willows), *Sambucus nigra* (Elder) and *Ulmus* species (elms) including *Ulmus glabra* (Wych Elm). Mixed scrub habitat was recorded along the banks of Stonleygoat Dike, Bulldike Drain and Holderness Drain.

3.2.52 The Cable C-D area lies adjacent to Arnold Drain LWS which includes mixed scrub habitat along the field/road boundaries (**Target Note 50**). The eastern edge of the road contains a linear area of *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) scrub with some *Rubus fruticosus* agg. (Bramble) that appears to have developed from two unmanaged parallel

hedgerows. Northwards along the road the scrub habitat becomes more species-rich with *Fraxinus excelsior* (Ash), *Rosa* species (roses), *Sambucus nigra* (Elder) and *Salix caprea* (Goat Willow). A full description and species list for Arnold Drain LWS can be found in **Appendix F**.

3.2.53 Within the grid connection cable route, the majority of dense scrub habitat is found in Figham Pastures LWS. There are linear areas of mature *Crataegus monogyna* (Hawthorn) (h3f) along Beverley and Skidby Drain and Figham Drain, often with dense patches of *Rubus fruticosus* agg. (Bramble). Areas of mature *Crataegus monogyna* (Hawthorn) scrub are also found close to the River Hull, with numerous semi-mature, mature and over-mature scattered *Fraxinus excelsior* (Ash) trees, some *Acer campestre* (Field Maple), *Alnus glutinosa* (Alder), *Alnus incana* (Grey Alder) and *Salix* species (Willow).

3.2.54 Scrub within the rest of the grid connection cable route is limited to *Rubus fruticosus* agg. (Bramble) scrub (h3d) along the railway cutting of the Hull to Scarborough Line with smaller patches of *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) together with some *Rosa canina* (Dog-rose). There are also noticeable amounts of tall semi-ruderal herbs including *Chamaenerion angustifolium* (Rosebay Willowherb), *Heracleum sphondylium* (Hogweed) and *Urtica dioica* (Common Nettle).

Plate 14 – Mixed scrub along the banks of Bulldike Drain

Other standing water (r1g)

Land Areas

3.2.55 Three ponds were recorded within the Land Areas. One is a very minor, inaccessible, shallow pond within semi-mature woodland (**Target Note 25**) with the only aquatic vegetation being a species of *Callitriche* species (a Water-starwort). The other two are more substantial, though still minor ponds

on the edge of agricultural fields which are more likely to be considered habitats of principal importance. One of these ponds is located in Field F2 within Land Area F (**Target Note 29; Plate 15**) and has abundant marginal vegetation with *Glyceria maxima* (Reed Sweet-grass), *Phalaris arundinacea* (Reed Canary-grass) and *Typha latifolia* (Bulrush). The second pond is located in Fild C4 within Land Area C (**Target Note 1**) and at the time of the survey held very little water with 100% cover of *Equisetum palustre* (Marsh Horsetail). Marginal vegetation comprised *Iris pseudacorus* (Yellow Iris), *Juncus acutiflorus* (Sharp-flowered Rush), *Juncus effusus* (Soft-rush) and *Mentha aquatica* (Water Mint).

3.2.56 In addition to these three ponds, *c*.60 wet ditches of various lengths, widths and depths were recorded across the Order Limits. Most were relatively minor, though contained shallow water with abundant marginal vegetation, usually *Phalaris arundinacea* (Reed Canary-grass) and *Epilobium hirsutum* (Great Willowherb). Other graminiods include *Glyceria maxima* (Reed Sweet-grass), *Juncus effusus* (Soft-rush) and *Sparganium erectum* (Branched Bur-reed) together with tall, colourful waterside species including *Angelica sylvestris* (Wild Angelica), *Filipendula ulmaria* (Meadowsweet), *Lythrum salicaria* (Purple-loosestrife) and *Pulicaria dysenterica* (Common Fleabane). In some places, the channel was shaded by *Rubus fruticosus* agg. (Bramble) and in a very few places by *Rubus caesius* (Dewberry).

3.2.57 Where there is a greater variety of species, the following aquatic and emergent species were noted: *Alisma plantago-aquatica* (Water-plantain), *Potamogeton natans* (Broad-leaved Pondweed), *Nasturtium officinale* (Water-cress) and *Veronica* cf. *catenata* (Pink Water-speedwell) together with the graminiods *Carex riparia* (Greater Pond-sedge), *Juncus acutiflorus* (Sharp-flowered Rush) and *Typha latifolia* (Bulrush) and the wetland and waterside species *Lysimachia vulgaris* (Yellow Loosestrife), *Eupatorium cannabinum* (Hemp-agrimony), *Hypericum tetrapterum* (Square-stalked St John's-wort) and *Stachys palustris* (Marsh Woundwort).

3.2.58 Aside from species of floating *Lemna* (a duckweed), there were no floating or submerged plants in the vast majority of the ditches within the Land Areas. However, some of the more major ditches could not be assessed in detail as the surface of the water was several metres from the top of the banks.

Plate 15 – The only permanent pond of any note within the Land Areas (Target Note 29)

3.2.59 Most of the larger ditches, drains and dikes are not within the Land Areas but instead form the boundaries of the Land Areas, including:

- Weel Stone Carr Drain (to the south of Land Area E);
- Routh and Meaux 'Road' (along the northern boundary of Field D7 within Land Area D);
- the majority of a major drain (east of Land Areas B and C, later flowing into Land Area D, **Target Note 6**).

3.2.60 The only larger, named drains within the Order Limits are Routh and Meaux Drain in Land Area D (**Target Note 14**), Meaux West Drain (a slightly smaller drain which crosses the Order Limits in Land Area E; **Target Note 26**), and Monk Dike a large drain running through Land Area C (**Target Note 6; Plate 16**) into Drewery's Sock Dike which separates Field C7 within Land Area C from the rest of Land Area C.

Plate 16 – One of the few major ditches within the Land Areas (Target Note 6)

3.2.61 Ditch species assessment was undertaken at 16 locations as shown by **Target Note TN1 (Aquatic Plants)** to **TN16 (Aquatic Plants)** on **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]** and **Appendix A of this report**. Ditches predominantly comprised of terrestrial vegetation (grassland species associated with the base of the hedgerow or margin of the field), or otherwise comprised mainly of tall, emergent graminiods including *Glyceria maxima* (Reed Sweet-grass), *Phalaris arundinacea* (Reed Canary-grass), *Phragmites australis* (Common Reed), *Sparganium erectum* (Branched Bur-reed) and *Typha latifolia* (Bulrush). There are also floating aquatic *Lemna* species (duckweeds). The relative abundance of the plants varied between area, and have been reported alongside the full species list included as **Table 15** in **Appendix F**.

3.2.62 The larger watercourses generally had a more diverse flora, and the ditches connected to those larger water courses were also more diverse.

Cable Areas

3.2.63 There are two large waterbodies present in the grid connection cable route, both located within a private angling club to the east of the River Hull in Weel (**Plate 17**). They are both surrounded by dense scrub and woodland and could not be accessed during the survey. There are no waterbodies or ponds within the interconnecting cable routes area.

Plate 17 – Private fishing lake near the River Hull

3.2.64 In addition to these two fishing lakes, there are several minor ditches as well as numerous larger drains and dikes across the interconnecting cable route and grid connection cable route. The majority of ditches were found at the boundaries of arable fields and pasture and contain narrow channels with very shallow water and limited aquatic vegetation. The banks are steep and vegetation is often dominated by nettlebeds of *Anthriscus sylvestris* (Cow Parsley), *Cirsium arvense* (Creeping Thistle), *Urtica dioica* (Common Nettle) and *Rubus fruticosus* agg. (Bramble). Dry ditches were also recorded along hedgerows and lines of trees.

3.2.65 There are two larger named drains and dikes within the interconnecting cable routes area: Stonleygoat Dike and Bulldike Drain. Stonleygoat Dike passes through Cabe B-B and is culverted under the A165 (**Plate 18**). Where it runs along the road, the banks are very steep, covered with dense *Rubus fruticosus* agg. (Bramble) and *Urtica dioica* (Common Nettle) and shaded by adjacent trees and scrub. The water is shallow and flowing, and there is limited aquatic vegetation. Towards the west the banks become shallower and bankside vegetation is dominated by grasses. Bulldike Drain passes through the north of Cable C-F. Its banks are densely vegetated with scrub and there appears to be 100% Bramble cover within the channel. The channel could not be viewed at the time of the survey due to dense scrub cover, therefore it is not known if the drain holds water.

Plate 18 – Stonleygoat Dike (Cable B-B)

3.2.66 There are five larger named drains and dikes within or adjacent to the grid connection cable route:

- Weel Stone Carr Drain (east of River Hull);
- Beverley and Skidby Drain (Figham Pastures LWS);
- Figham Drain (Figham Pastures LWS);
- Beverley and Skidby (Adjacent to Figham Pastures LWS and entrance to Beverley Holiday Park);
- Beverley Parks Sewer (east of The Old Granary); and
- Wanlass Beck Drain (north of National Grid Creyke Beck Substation).

3.2.67 The majority of the larger named drains in the grid connection cable route are located within cattle and horse-grazed pasture around the River Hull. Weel Stone Carr Drain, east of the River Hull, is a *c.*2 m wide drain containing deep standing water with no aquatic vegetation (**Plate 19**). The banks are poached by cattle and limited marginal vegetation is present. The water is turbid and likely to be polluted by nutrient runoff from the adjacent cattle fields. The drain is culverted several times along its length under farm tracks and towards the east of the drain the banks are shaded by a hedgerow of *Crataegus monogyna* (Hawthorn).

3.2.68 Beverley and Skidby Drain runs parallel to Beverley and Barnston Drain in Figham Pastures LWS. The drain has a narrow channel with shallow banks and at the time of the survey was holding very little water. In-channel vegetation is abundant and is dominated by *Typha* species and Soft Rush. Bankside vegetation is short, modified grassland grazed by cattle and horses and there is some shading from trees and scrub. Figham Drain runs along the boundary of Figham Pastures LWS, and the majority of the drain is fenced off from livestock. It holds slightly more water with abundant (duckweed) cover and limited marginal vegetation and is shaded by a line of mature trees and hedgerow.

3.2.69 Beverley and Skidby watercourse (**Plate 20**) is culverted at several points along its length, including under Hull Road A1174 where is enters Beverley Holiday Park. North of Hull Road it has a wide channel with abundant *Typha* cover, and Great Willowherb and Common Nettle growing on the banks. It opens up into a shallow pool that is poached by livestock. South of Hull Road, the watercourse becomes narrower with flowing water and has limited aquatic and marginal vegetation. Bankside vegetation is predominantly dense scrub and modified grassland.

3.2.70 Wanlass Beck drain runs between the Order Limits and Cottingham Caravana and Motorhome Services, however it could not be viewed during the survey due to the dense scrub and a hedge.

Plate 19 – Weel Stone Carr Drain

Plate 20 – Beverley and Skidby watercourse in Beverley Holiday Park

Rivers and streams (r2)

3.2.71 The rivers within the Land Areas and the grid connection cable route are heavily modified or straightened. The River Hull is heavily modified in the section that is within the Order Limits, but otherwise retains a natural meander, all the other rivers present within the Order Limits have been straightened and therefore are not considered 'highly natural' watercourses, as described below.

3.2.72 The rivers are not headwaters, or listed as priority river habitat, in the Natural England Priority Habitat Inventory (Natural England 2024) and do not meet the criteria for inclusion as 'highly naturally functioning stretches' under Natural England guidelines (Natural England 2014) for the Statutory Biodiversity Metric (DEFRA 2024). Following this guidance, the rivers are best described as r2b, 48- other rivers and streams, heavily modified, under the UK Habitat classification (UK Hab Ltd 2023) which is not listed as a priority habitat.

3.2.73 Under UK BAP criteria for priority habitats (BRIG 2011) the watercourses do not meet the criteria as natural watercourses, however, they may meet criteria 7, by potentially providing habitat to more than six widespread BAP priority species, such as water vole, otter, soprano pipistrelle, European eel, bullhead and river lamprey. These rivers should therefore be considered habitats of principal importance under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, and priority habitat when considering the requirements of the National Planning Policy Framework (NPPF).

Land Areas

3.2.74 Five watercourses that form the boundaries of the Land Areas have been identified on the Statutory Main Rivers Map[3] and have been categorised as other rivers and streams, heavily modified (r2b, 48):

- Holderness Drain (to the north of Land Area G and south and west of Land Area F);
- Meaux and Routh East Drain (West of Land Areas B, C and D);
- Arnold West Carr Drain (West of Land Areas B, C and D);
- Monk Dike (in between areas of Land Areas B, though not on the Land Area itself); and
- Drewery's Sock Dike (West of Land Areas C).

3.2.75 Species recorded in these habitats included the tall emergent graminiods *Glyceria maxima* (Reed Sweet-grass), *Phalaris arundinacea* (Reed Canary-grass), *Phragmites australis* (Common Reed), *Sparganium emersum* (Unbranched Bur-reed), *Sparganium erectum* (Branched Bur-reed) and *Typha latifolia* (Bulrush). Aquatic species included *Helosciadium nodiflorum* (Fool's-water-cress), *Callitriche* species (water-starwort), *Potamogeton natans*

[3] Environment Agency Statutory Main Rivers Map
https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

(Broad-leaved Pondweed), *Stuckenia pectinata* (Fennel Pondweed) and floating *Lemna* species (duckweed). Other waterside and wetland species at the margins and in shallow water included *Mentha aquatica* (Water Mint), *Rorippa amphibia* (Great Yellow-cress) and *Veronica beccabunga* (Brooklime).

Cable Routes

3.2.76 The following watercourses within or adjacent to the interconnecting cable routes and grid connection cable route have been identified on the Statutory Main Rivers Map and have been categorised as other rivers and streams (r2b) habitat:

- Holderness Drain (within Cable E-E and adjacent to Cable C-F);
- Arnold Drain and Riston Drain (adjacent to Cable C-F);
- River Hull (Figham Pastures LWS);
- Beverley and Barnston Drain (Figham Pastures LWS); and
- Wanlass Beck (north of Creyke Beck substation).

3.2.77 Holderness Drain passes through the centre of the Cable E-E area (**Plate 21**) and forms the western boundary of the Cable C-F area. Arnold and Riston Drain forms the north-western boundary of the Cable C-F area and is part of Arnold Drain LWS. Both drains have *c.*4 m high steep banks with a wide channel and abundant aquatic and marginal vegetation. Dense scrub covers one of the banks and heavily managed, modified grassland covers the other. In some areas along the channel, there is floating *Lemna* species (duckweed), which achieves 100% cover in places, together with the aquatic plant *Potamogeton natans* (Broad-leaved Pondweed) and emergent graminoids including *Phalaris arundinacea* (Reed Canary-grass), *Phragmites australis* (Common Reed), *Sparganium erectum* (Branched Bur-reed) and patches of *Typha latifolia* (Bulrush).

Plate 21 – Holderness Drain (Cable E-E)

3.2.78 The River Hull and Beverley and Barnston Drain both pass through Figham Pastures LWS in the grid connection cable route. This section of the River Hull is *c*.18 m wide with relatively deep water and fast-flowing with shallow banks (**Plate 22**). Aquatic plant species were generally limited to the edges of the channel, with no species dominating though there are small amounts of the grasses *Glyceria maxima* (Reed Sweet-grass), *Phalaris arundinacea* (Reed Canary-grass) and *Phragmites australis* (Common Reed) with *Heloscandium nodiflorum* (Fool's-water-cress), *Mentha aquatica* (Water Mint), *Rorippa amphibia* (Great Yellow-cress) and *Veronica beccabunga* (Brooklime). Within the main channel the aquatic plants *Stuckenia pectinata* (Fennel Pondweed), and *Sparganium emersum* (Unbranched Bur-reed) were present in small amounts. The western bank comprises grazed modified grassland while the eastern bank contains ungrazed other neutral grassland, dominated by the waterside tall-herbs *Epilobium hirsutum* (Great Willowherb) and *Filipendula ulmaria* (Meadowsweet) on the lower bank. Beverley and Barnston Drain is *c*.7 m wide with relatively slow-flowing water and abundant *Sparganium erectum* (Branched Bur-reed) together with small amounts of *Glyceria maxima* (Reed Sweet-grass) and floating *Lemna* sp. (Duckweed species). Emergent and aquatic species present in very small amounts included *Phalaris arundinacea* (Reed Canary-grass), *Callitriche* species (water-starwort) and *Potamogeton natans* (Broad-leaved Pondweed), particularly along the edges of the channel (**Plate 23**). Dense Hawthorn scrub is present along the majority of the western bank while the eastern bank comprises recently managed, grazed modified grassland.

Plate 22 – River Hull in Figham Pastures LWS

Plate 23 – Beverley and Barnston Drain (Figham Pastures LWS)

3.2.79 Wanlass Beck connects to Wanlass Beck Drain north of Park Lane and runs south through woodland to the east of Creyke Beck Substation. Wanlass Beck could not be viewed during the survey due to dense vegetation and a lack of agreed access.

Aquatic Marginal vegetation (f2d)

Land Areas

3.2.80 There are some instances of Aquatic Marginal vegetation, formed of species such as Phragmites *australis* (Common Reed), however none of these are substantial reedbeds that would classify as a habitat of principal importance. (**Target Note 17**).

Built up areas and gardens (u1)

Land Areas

3.2.81 There is usually at least one formal stone or metalled farm track within most of the Land Areas (Built linear features u1e), though they are frequently muddy with patches of common weeds. Some of the areas also border Meaux Lane and Meaux Road (being either side of these roads in the case of Areas E and G).

Cable Routes

3.2.82 Both the interconnecting cable routes and grid connection cable route include several sections of public and private roads (u1e). The Cable B-B area includes a section of the A165 and Cable C-F includes a section of an unidentified public single-lane road. The grid connection cable route includes sections of the following roads:

- A private single-lane road in Weel east of the River Hull;
- Hull Road A1174;

- Long Lane;
- A1079; and
- Park Lane.

3.2.83 Both routes also contain some areas of gravel and bare ground along farm tracks or at the entrance to fields (Artificial unvegetated, unsealed surface u1c).

Invasive non-native plant species

3.2.84 No invasive species were identified within the Order Limits. Small infestations could have been missed due to the broad scope of the PEA survey and dense vegetation along many of the ditches which would obscure many invasive aquatic species. However, it is highly unlikely that any non-native, invasive plant species will be present within working areas as these are mostly intensively managed arable fields.

Arnold Drain LWS

3.2.85 Most of the notable species in the LWS citation dated 2012, were re-recorded during the survey in 2024. Additional species recorded in 2024 included Agrimonia *eupatoria* (Agrimony), *Centuarea debeauxii* (Chalk Knapweed), *Cruciata laevipes* (Crosswort), and *Jacobaea erucifolia* (Hoary Ragwort), which were all found in appreciable quantity. Species that were listed on the citation but not recorded in 2024 included the grasses; *Avenula pubescens* (Downy Oat-grass) and *Alopecurus geniculatus* (Marsh Foxtail), a sedge; *Carex flacca* (Glaucous Sedge), and the broad-leaved herbs; *Valeriana officinale* (Common Valerian) and *Hypericum hirsutum* (Hairy St John's-wort). A full species list is included as **Table 14** in **Appendix F**.

3.3 Protected and notable animals

Invertebrates

3.3.1 The BDS returned a single record of white-letter hairstreak along Meaux Lane. The BDS returned no records of invertebrates within 1km of the grid connection cable route. Most of the habitats present around the edges of the Land Areas and grid connection cable route fields are considered likely to support a common assemblage of invertebrate species, typical of neutral grassland, woodland and scrub, and shallow ditches. The more moderately species rich fallow fields and arable margins (e.g. **Target Note 21**) will also offer additional habitat for pollinating insects. However, it is considered unlikely that any rare invertebrate species relyon habitat within the Order Limits.

Fish

3.3.2 The BDS returned two records of European eel (*Anguilla anguilla*) from Monk Dike within 1km of the Order Limits. No other records of fish were included in the BDS.

3.3.3 Most of the ditches within the Site are narrow, often with very shallow water or completely dry. It is unlikely that these small ditches support a variety of fish species. However, the rivers within the Order Limits have greater water depths, reducing the risk of drying out and making it more likely they support a range of fish species. The River Hull is the main watercourse within the grid connection cable route and along the Land Areas, and it is likely to support a diverse range of fish species.

3.3.4 Detailed assessment results of suitability of ditches and watercourses within the Site to support fish are presented in the **ES Volume 4, Appendix 7.8: Aquatic Walkover Report [EN010157/APP/6.4]**.

GCN

3.3.5 The BDS returned no records of GCN within 1km of the Order Limits. Habitats within the Order Limits, including rough grassland field margins, patches of scrub and woodland, also provide suitable terrestrial habitat for GCN. The network of hedgerows and ditches also serve as potential corridors to allow movement and dispersal of GCN. However, the large expanses of frequently disturbed and intensively managed arable cropland offer poor quality terrestrial habitat for GCN and it is unlikely that they would be found in such areas. Therefore, within the majority of the working areas, the risk of GCN presence is likely to be very low.

3.3.6 There are three ponds within the Land Areas (**Target Note 1, 25 and 29**) and there are three ponds within 250m radius of the Land Areas that could provide potential breeding habitat for great crested newts. Four of these were accessible to survey, and three were suitable for eDNA testing.

3.3.7 A total of 13 ponds within a 250m radius of the grid connection cable route were identified that could be potentially suitable for breeding great crested newts. These ponds were not eDNA tested as the grid connection cable route was determined outside the eDNA surveying season.

3.3.8 There are also numerous ditches and drains within 250m of the Order Limits that may be suitable for supporting breeding great crested newts, however eDNA surveys have only been undertaken for ditches and drains within the Land Areas. No eDNA surveys have been carried out within the interconnecting cable routes or grid connection cable route for the reasons outlined in the paragraph above.

3.3.9 A total of five ditches within the Land Areas were deemed suitable for eDNA sampling, the remaining ditches were assessed as unsuitable either due to water quality or lack of safe access to the water's edge for surveying purposes. Due to the number of ditches across the Order Limits, only the ditches that were suitable for eDNA testing have been included within the table.

3.3.10 The results of these eDNA tests and HSI assessments, along with the results from the ditches are within **Table 7**, **Figure 3**, and the full eDNA reports within **Appendix E**.

Table 7: HSI and eDNA summary

Reference	Lat, Long	HSI score	Suitability	eDNA
Ditches				
Ditch 1 Arnold and Riston Drain	53.875254, -0.315068	N/A	-	Negative
Ditch 2	53.875978, -0.315543	N/A	-	Negative
Ditch 107	53.848349, -0.355347	N/A	-	Negative
Routh and Meaux Drain	53.855044, -0.356885	N/A	-	Negative
Ditch B	53.852589, -0.361494	N/A	-	Negative – low sediment
Ponds				
Pond A	53.831236, -0.346762	0.644	Average	Negative
Pond B	53.829770, -0.338367	0.629	Average	Negative – low sediment
Pond 1	53.873856, -0.312396	0.512	Below average	Not suitable for the use of eDNA (Very polluted irrigation pool)
Pond 2	53.850614, -0.336385	0.326	Poor	Negative – low sediment
GCCR-1	53.831511, -0.398247	0.790	Good	Not undertaken
GCCR-2	53.826344, -0.382047	No Access	No access but assessed as unsuitable as the waterbody is a stocked fishing lake.	No Access.
GCCR-3	53.833879, -0.406980	0.686	Average	Not undertaken
GCCR-4	53.834461, -0.405672	0.457	Poor	Not undertaken
GCCR-5	53.831169, -0.407860	dry	N/A	Not undertaken

Reference	Lat, Long	HSI score	Suitability	eDNA
GCCR-6	53.830156, -0.407732	No access	No access but assessed as unsuitable as the waterbody is a stocked fishing lake.	No access
GCCR-7	53.830054, -0.406873	No access	No access but assessed as unsuitable as the waterbody is a stocked fishing lake.	No access
GCCR-8	53.830814, -0.408633	No access	No access but assessed as unsuitable as the waterbody is a stocked fishing lake.	No access
GCCR-9	53.828459, -0.386360	0.442	Poor	Not undertaken
GCCR-10	53.826141, -0.409362	0.750	Good	Not undertaken
GCCR-11	53.818921, -0.398483	0.613	Average	Not undertaken
GCCR-12	53.808786, -0.407324	0.607	Average	Not undertaken
GCCR-13	53.805872, -0.407624	0.459	Poor	Not undertaken
GCCR-14	53.828384, -0.391243	0.460	Poor	Not undertaken

3.3.11 All three ponds within the Land Areas that were tested returned negative eDNA results. While this is not proof of the absence of GCN, it does indicate that they are likely to be absent, or only present so rarely as to be undetectable.

3.3.12 All five ditches in the Land Areas that were tested returned negative eDNA results. Due to the spread of negative eDNA results across the Land Areas, the likelihood of GCN being present within Land Areas is considered to be low.

3.3.13 The majority of the remaining ditches within the Land Areas were considered unsuitable, either because they were completely or almost entirely dry or due to them having flowing water, sufficient to deter GCN from using them for breeding purposes. It its therefore considered likely that GCN will be absent from the ditches within Land Areas.

Reptiles

3.3.14 The BDS returned two records of grass snake within 1 km of the Land Areas, of which one is within 100 m west of Field B1 within Land Area B along Monk Dike. The BDS also returned a single record of grass snake *c.*600 m north-west of Figham Pastures LWS within the grid connection cable route.

3.3.15 The majority of the Order Limits is dominated by frequently disturbed arable cropland. However, there are more suitable habitats within theOrder Limits. Examples of suitable habitats include Figham Pastures LWS within the grid connection cable route. Areas of rough grassland (**Target Notes 10 and 31**), hedgerows, wet ditches, drains and rough grassland and scrub along field boundaries. The ditches and drains in particular offer suitable habitat for grass snakes, with basking sites, foraging opportunities and usually some nearby woodland or abandoned corners of fields which offer potential hibernation opportunities.

3.3.16 It is therefore assumed that reptiles (mainly grass snakes) could be present in some areas of the Order Limits, however they will mainly be closely associated with boundary features rather than within the fields themselves and are likely to only be present at relatively low density. They are therefore unlikely to be negatively affected by the Proposed Development, except potentially during construction.

Birds

3.3.17 The BDS returned records of three protected bird species and 11 other notable bird species within 1 km of the Land Areas. Additionally, the BDS returned records of six protected bird species, including kingfisher (*Alcedo atthis*), hen harrier (*Clocaircus cyaneus*), whimbrel (*Numenius phaeopus*), green sandpiper (*Tringa ochropus*), and barn owl (*Tyto alba*), all recorded within 100 meters of the grid connection cable route. It also returned records of 14 other notable bird species within 1 km of the grid connection cable route.

3.3.18 The Land Areas portion of the Proposed Development supports a range of habitats commonly associated with large areas of arable land, primarily comprising crop fields, modified and other neutral grass margins, boundary hedgerows and ditches, patches of scrub, individual trees and several areas of woodland of varying size. In addition, the grid connection cable route passes through the River Hull and Figham Pastures LWS, the latter being a large area of coastal floodplain grazing marsh. These habitats have suitability for supporting a range of breeding bird species, predominantly those associated with farmland and woodland assemblages.

3.3.19 Additionally, the habitat within the Order Limits has suitability for supporting several Schedule 1 breeding bird species such as barn owl, including multiple potential nesting locations and barn owl boxes. Other Schedule 1 species that may be present include Cetti's warbler (C*ettia cetti*), hobby (*Falco subbuteo*) and kingfisher.

3.3.20 The large fields present within the Order Limits have the potential to support wintering birds which use nearby protected sites, particularly those associated with the Humber Estuary SPA.

3.3.21 Bird surveys including breeding, wintering and passage surveys, were carried out on the Land Areas by Avian Ecology and RSK between 2022 and 2024, the results of which are presented in the Avian Ornithology report and RSK Wintering, Breeding and Passage Bird Survey Reports (**ES Volume 4, Appendix 7.5: Ornithological Survey Report (Produced by Avian Ecology) [EN010157/APP/6.4]**; **ES Volume 4, Appendix 7.4: Wintering Bird Survey Report [EN010157/APP/6.4]**; **ES Volume 4, Appendix 7.3: Breeding Bird Survey Report [EN010157/APP/6.4]** and **ES Volume 4, Appendix 7.9: Passage Bird Survey Report [EN010157/APP/6.4]**).

Bats

3.3.22 The BDS returned 13 records of bats within 1 km of Land Areas and interconnecting cable routes of which six are bat roosts. The BDS returned 36 records of bats within 1 km of the grid connection cable route of which eight are bat roosts. Background data searches for the Land Areas and grid connection cable route provided records of the following species:

- Common pipistrelle bat (*Pipistrellus pipistrellus*);
- Noctule bat (*Nyctalus noctula*);
- Daubenton's bat (*Myotis daubentonii*);
- Whiskered bat (*Myotis mystacinus*);
- Brown long-eared bat (*Plecotus auratus*); and
- In addition, there are records of unidentified pipistrelles.

3.3.23 Most of the habitat within the Land Areas is dominated by arable fields and offers little suitability for foraging and commuting bats. However, the network of hedgerows and ditches with occasional areas of woodland are likely to serve as commuting and foraging corridors for bats in the area.

3.3.24 The habitat within both the grid connection and interconnecting cable routes are also dominated by large open arable fields bordered by hedgerows and lines of trees. However, habitat with greater value for foraging and commuting bats including Figham Pastures LWS and the River Hull are also situated within the grid connection cable route.

3.3.25 Over 118 individual trees and over 43 groups of trees with bat roosting suitability have been identified either within the Order Limits or along the boundary of the Order Limits. Two bridges within the Order Limits or along the boundary of the Order Limits have been classified as suitable for roosting bats and a further 11 structures (bridges and culverts) will require further assessment to determine if they are suitable for roosting and/or hibernating bats, if they are likely to be directly affected by the Proposed Development. The detailed results of the GLTA and PRA surveys are presented in the **ES Volume 4, Appendix 7.6: Bat Survey Report [EN010157/APP/6.4]**.

Water voles

3.3.26 The BDS returned three historic records of water vole, including one from Monk Dike within 100 m of Land Area B. Additionally, the BDS returned 15 records of water vole within 1 km of the grid connection cable route. Most of these records being from Mill Dam Drain from 2016, with a few historic records within 100 m of Figham Pastures LWS from 1972.

3.3.27 The Land Areas contain a network of ditches, some of which were noted as being potentially suitable for water vole, comprising banks with soft substrate suitable for burrowing and emergent vegetation for foraging. However, the majority of ditches, particularly within the Land Areas, only had quite shallow water at the time of the survey and no immediate evidence of water voles such as burrows, latrines or feeding remains were noted. It is possible that water voles may be present on the Order Limits within areas of suitable habitat though it is highly unlikely that the habitat within the Order Limits support a significant population.

3.3.28 The grid connection cable route and interconnecting cable routes also contain a network of ditches, most of which were dry at the time of the survey. However, the cable routes also include streams and large drains that provide suitable habitat for water voles, with banks of soft substrate suitable for burrowing and emergent vegetation for foraging. Due to the steep banks and dense vegetation, not all ditches, streams, and drains were searched for evidence of water voles.

3.3.29 Detailed results are presented in the **ES Volume 4, Appendix 7.7: Water Vole and Otter Habitat Suitability Report [EN010157/APP/6.4]**.

Otters

3.3.30 The BDS returned no records of otter within 1 km of the Land Areas B to F. The BDS returned one record of otter from 2012 along River Hull at Figham Pastures LWS *c*.500 m north of the grid connection cable route. A search of MAGIC maps identified one otter mitigation licence record *c*.600 m north of Figham Pastures LWS, also along the River Hull.

3.3.31 While scrub on some of the very major ditches along the Land Area boundaries may offer suitable resting or lying up sites for otters, no spraints or other evidence of otters was found. However, owing to the density of the vegetation in places and the lack of a detailed survey of ditches, it is possible that field signs may have been missed as they could not be searched for effectively. All but the major ditches (mainly around the boundaries of the Land Areas) lack sufficient depth or permanency of water to be particularly suitable for otters, and most of the habitat within the Order Limits itself offers little suitable cover for lying up or potential holt locations.

3.3.32 Large drains and the River Hull have banks covered in dense scrub that run through the grid connection cable route and along the boundaries. These watercourses offer suitable resting sites for otters and foraging and commuting habitat. The majority of ditches within both grid connection cable route and

interconnecting cable routes may only be suitable for commuting. Due to the steep banks and dense vegetation, not all ditches, streams, and drains were searched for evidence of otters. Detailed results are presented in the **ES Volume 4, Appendix 7.7: Water Vole and Otter Habitat Suitability Report [EN010157/APP/6.4]**.

3.3.33 The main drains/ditches provide good habitat connectivity for otter, this provides otter access to the rest of the Order Limits, where they may make use of resting places within secluded areas, such as woodlands and scrub, or make use of hollows such as overturned boats and disused badger setts, drainage pipes/culverts, if these habitats are present within the Order Limits.

Badgers

3.3.34 The BDS returned a single record of a badger within 100 m of the Land Areas from 2011, and a single record *c*.800 m from the grid connection cable route from 2016. Areas of woodland and steep banks provide suitable habitat for sett building, while arable cropland and grassland are suitable for foraging. 17 badger setts were identified along banks, woodland, and hedgerows, with badger hairs and latrines also recorded within the Order Limits. Detailed results are presented in the **ES Volume 4, Appendix 7.2: Badger Survey Report (Confidential) [EN010157/APP/6.4]**.

3.3.35 As the PEA surveys were completed during the summer, the tall and dense vegetation posed a significant constraint to identifying badger field signs. Land outside the Order Limits has not been thoroughly surveyed but badger field signs outside the Order Limits have been recorded if they could be seen from within the Order Limits.

Other species

3.3.36 There are seven records of hedgehog from within 1 km of the Land Areas and 16 records of the grid connection cable route. Woodland, scrub, hedgerows, grassland and grass field margins within the Order Limits provide suitable foraging habitat for hedgehogs, though some of the ditches and drains may act as barriers to their dispersal between the areas of suitable habitat. There may be opportunities for hedgehogs to hibernate in the few dense areas of scrub and woodland within the Order Limits and also within suitably dense cover at the base of hedgerows. It is therefore considered possible that hedgehogs are present within the Order Limits.

3.3.37 Brown hare (*Lepus europaeus*) favour a mosaic of arable fields, grassland and woodland edges. The habitat within the Order Limits provides suitable habitat for brown hares, though few sightings of this species were noted during the surveys. There is one record of brown hare within the grid connection cable route from 2001.

4.0 DISCUSSION

4.1 Designated Sites

Internationally designated sites

4.1.1 The potential for likely significant effects on internationally designated sites from the Proposed Development are presented in the **Habitats Regulations Assessment – Information to Inform the Appropriate Assessment [EN010157/APP/5.3]** and discussed in detail within **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Statutory designated sites

4.1.2 The two nearby national designated sites (Beverley Parks Local Nature Reserve (LNR) and Leven Canal SSSI) are both unlikely to be directly affected by the proposals. This is particularly the case for Leven Canal SSSI which is over 1 km away from the Order Limits, and is mainly designated for the wetland vegetation. The Proposed Development is also not hydrologically linked to Leven Canal SSSI. Road infrastructure, agricultural fields and a country park separate the Order Limits from the SSSI. The Order Limits are located within the Leven Canal SSSI Impact Risk Zone, however none of the developments which are considered of concern relate to the Proposed Development. Therefore, no significant effects to Leven Canal SSSI are expected to arise from the Proposed Development.

4.1.3 Beverley Parks LNR is located 280 m from the Order Limits and is separated from the Order Limits by large open arable fields and an active railway. No significant effects to Beverley Parks LNR are expected to arise from the Proposed Development.

Sites of Special Scientific Interest (SSSI) - Impact Risk Zones

4.1.4 The Order Limits interact with many SSSI impact risk zones in the wider area; however, no impacts are anticipated. Natural England has been consulted over the proposals, as summarised in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Non-statutory designated sites

4.1.5 The four non-statutory designated sites within 1km of the Order Limits are all local wildlife sites (LWSs). Meaux and Arnold Drain LWSs are located directly adjacent to the Order Limits and are designated for roadside verges which are regularly subject to pollution and disturbance from vehicles and agricultural operations. The Cote Wood LWS also borders the Order Limits (**Target Note 24**) and is designated for ancient semi-natural woodland. Meaux LWS, Arnold Drain LWS and Cote Wood LWS are not anticipated to be directly affected by

construction/decommissioning works nor operational impacts, as detailed within **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

4.1.6 Figham Pastures LWS is located within the grid connection cable route and is designated for its habitats. It will be impacted by the construction of the Proposed Development. Specific impacts and mitigation measures are discussed further as in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

4.2 Habitats and plants

Habitats

4.2.1 Some of the woodland, coastal floodplain grazing marsh, all of the hedgerows, rivers and a pond within the Order Limits (**Target Note 29**) are all habitats of principal importance listed under Section 41 of the NERC Act 2006. Also, most of the wet ditches and drains have at least an equal value to these habitats. Ponds, and all woodland will be retained under the proposals. Despite the presence of these priority habitats, all habitats within the Order Limits are common and widespread in the surrounding landscape, and the vast majority of the footprint of the proposals is within intensively managed arable fields with negligible botanical value.

4.2.2 Measures to safeguard habitats are outlined in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Plant species

4.2.3 While some of the ditches have a variety of aquatic species, none of the plant species identified during the surveys are rare, all being listed as 'least concern' on the England red list (Stroh *et al*. 2014). Also, no locally scarce species were identified and all of the less common plants (or axiophytes) such as *Alisma plantago-aquatica* (Water-plantain), *Linum catharticum* (Fairy Flax), *Lythrum salicaria* (Purple-loosestrife), *Potamogeton natans* (Broad-leaved Pondweed) and *Stachys sylvatica* (Hedge Woundwort) are reportedly frequent or common in the River Hull valley (Crackles 1990). Additionally, none of the rarer species such as *Butomus umbellatus* (Flowering-rush) and *Oenanthe fistulosa* (Tubular Water-dropwort) which have been found on the nearby Leven Canal SSSI were identified within the Order Limits. Since all of the less common plant species that are present within the Order Limits are also restricted to ditches, hedges and woodlands, outside of the proposed solar PV areas, they should not be significantly affected by the proposals.

4.2.4 Of the arable plants, *Silene noctiflora* (Night-flowering Catchfly) is listed as vulnerable red listing based on 2001 IUCN guidelines. It is a declining arable weed, though frequent on the Yorkshire Wolds according to Crackles (1990).

Important hedgerows

4.2.5 16 hedgerows are important under The Hedgerow Regulations 1997, part 2, wildlife and landscape criteria for important hedgerow selection. Designs should aim to minimise damage to important hedgerows, and compensation should be designed such that the important status of the hedgerows are unchanged. This could be achieved for example by increasing the species diversity through planting and including tree planting in the retained hedgerow sections. Further assessment and recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and the **Outline Landscape and Ecological Management Plan (Outline LEMP) [EN010157/APP/7.5]**.

Non-native, invasive plant species

4.2.6 As no invasive species were identified within the Order Limits, it is unlikely that any significant populations exist within the Order Limits. Further recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

4.3 Protected and other notable species

Invertebrates

4.3.1 The proposed working areas comprise almost entirely of arable crop fields, with such areas considered unlikely to support a particularly diverse assemblage of invertebrates. No further surveys for invertebrates are recommended. However, perimeter habitats which offer the greatest suitability for invertebrates should be retained, enhanced and protected from damage. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Great crested newts

4.3.2 The great crested newt eDNA results for the ditches and ponds surveyed within the Land Areas suggest great crested newts are likely to be absent from most if not all of the Land Areas. No eDNA surveys were completed of ponds and ditches within 250m of the grid connection cable route or the additional pond identified within Field C4 within Land Area C. If great crested newts are present within the Order Limits, they are unlikely to be directly affected by the proposals aside from potential crossings of ditches and hedgerows for cable routes and access tracks, and any large-scale management works of marginal habitats such as rough grassland. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Reptiles

4.3.3 The majority of the habitat within the Order Limits is comprised of arable fields that provide sub-optimal habitat for reptiles. Figham Pastures LWS, woodland, scrub, ditches, drains, hedgerows and rough grassland areas offer more

suitable habitat for reptiles. It is unlikely that reptiles are present within the Order Limits at a high density and if any are present (most likely grass snakes), they will be largely restricted to boundary habitats, outside of the main working areas. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Birds

4.3.4 The habitats within the Order Limits are suitable for a range of protected and other notable bird species, and it is possible that proposals may affect species that use nearby protected sites. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Bats

4.3.5 The habitat within the Order Limits is considered to offer moderate value for foraging bats, with key areas being boundary features such as hedgerows, ditches, drains, River Hull, scrub and areas of woodland. Over 118 individual trees and over 43 groups of trees with bat roosting suitability have been identified either within the Order Limits or along the boundary of the Order Limits. Two structures within the Order Limits or along the boundary of the Order Limits have been classified as suitable for roosting bats and a further 11 structures require further assessment to determine if they are suitable for roosting and/or hibernating bats. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Water voles

4.3.6 The ditches and drains within the Order Limits offer some suitability for water voles, and they could therefore be present in many of the ditches and drains. Watercourses and ditches are not anticipated to be affected by operational works due to the passive nature of works and maintenance of minimum 10 m buffer zones. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

4.3.7 The larger drains may be suitable for shelter while the smaller ditches may be used for commuting otter. Therefore, otters may be present within the ditches and watercourses within the Order Limits. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Badgers

4.3.8 The habitat within Order Limits offers suitable habitat for badgers and multiple setts have been identified within the Order Limits. All setts were identified along the boundary features which will be retained. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Other species

4.3.9 The habitats within the Order Limits are suitable for other species such as hedgehogs and brown hares. Detailed recommendations are presented in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

Enhancements

4.3.10 Ecological enhancement and mitigation are detailed within **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**, **Outline LEMP [EN010157/APP/7.5]** and **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]**.

4.4 Validity of Data

4.4.1 Unless the baseline habitats and conditions change significantly, the surveys carried out for this report should remain valid until February 2026, 18 months from the date of the survey, when a re-assessment of the validity should be undertaken (CIEEM 2019).

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FIGURES

Figure 1. Site Location Plan with Field Numbering System

Figure 2. UKHab Habitat survey (CONFIDENTIAL) (See **ES Volume 4, Appendix 7.1: PEA Report - Figure 2 UKHab Habitat Survey (CONFIDENTIAL) [EN010157/APP/6.4]**)

Figure 3a. GCN pond and ditch survey results

Figure 3b. Grid Connection Cable Route Pond Locations

Figure 4a. Internationally Designated Sites within 10km

Figure 4b. Designated Sites within 2km and indicative Locations of Non-Statutory Sites

Figure 5. Important Hedgerows

503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000 514000

443000 442000 441000 440000 439000 438000 437000 436000 435000

Legend:

Order Limits

Field numbers

Routh
Tickton
Long Riston
Meaux
Beverley
Woodmansey
Swine
Kingswood
Grange Way
Beverley Grange
East Riding Community Hospital
St Mary's Cemetery
Norwood
Swinemoor Lane
Grovehill Road
Weel Road
Hull Road
The Common
Beverley Grammar School
Long Lane
Claremont House
Woodmansey Church of England (Voluntary Controlled) Primary School
Ferry Road
Wawne Primary School
Drove Lane
Sicey Lane
Carlam Lane
Dales Fitness Centre
Highlands Primary School
Eastfield
Kingswood Parks Primary School
Kingswood Academy
Kingswood Retail Park
Dunswell Primary School
Dunswell Lane
Cottingham Parks Golf and Leisure Club
Carr Lane
Rise Lane
Catwick Lane
Black Tup Lane
Woodhouse Lane
Ings Lane
Benningholme Lane
Swine Road
Meaux Road
Wawne Road
Skirlaugh Road
A1035
A165
A164
A1174
A1079
A1033

B1 B2 B3 B4 B5 B6 B7 B8
C1 C2 C3 C4 C5 C6 C7 C8 C9
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18
E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 F13 F14 F15 F16 F17

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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 1:

Site Location Plan with Field Numbering System

0 500 1,000 1,500

Metres

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Document Path: C:\OneDrive - RSK Group\08 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Hill Solar Farm - Figure 1 - Site Location Plan with Field Numbering System.aprx

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444400 444200 444000 443800 443600 443400 443200 443000 442800 442600 442400 442200

Ditch 2

Ditch 1

Ditch 1

Pond 1

Ditch 1

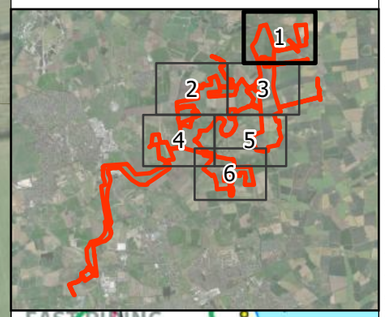
Legend:

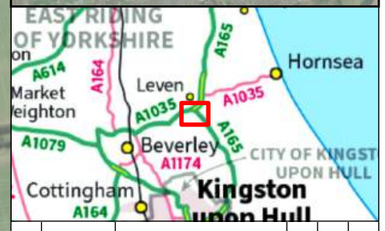
Order limits

Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

Negative





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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3a:

GCN Pond and Ditch Survey Results
Page 1 of 6

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Metres
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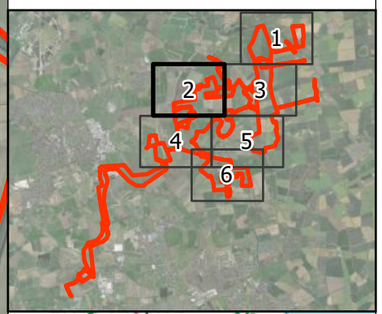
442600 442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

Legend:

- Order limits
- Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative



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RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3a:

GCN Pond and Ditch Survey Results
Page 2 of 6

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Routh & Meaux Drain

Ditch B

Ditch B

Ditch 107

Pond 2

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442600 442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

Ditch 1

Routh & Meaux Drain

Pond 2

Ditch 1

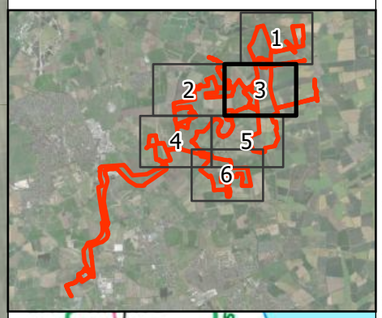
Ditch 1

Legend:

- Order limits
- Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative



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GCN Pond and Ditch Survey Results
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440800 440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

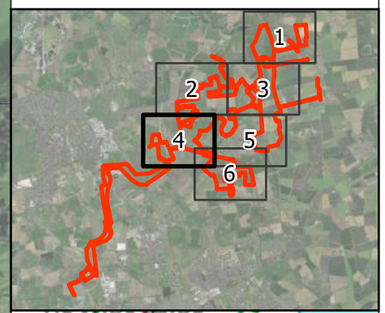
Ditch B
Ditch B
Routh & Meaux Drain
Ditch 107
Pond A

Legend:

- Order limits
- Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative



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GCN Pond and Ditch Survey Results
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440800 440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

Pond 2

Ditch 1

Ditch 1

Ditch 1

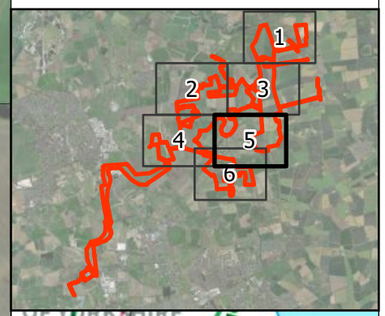
Pond A

Legend:

- Order limits
- Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative



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EXPERTS IN ECOLOGY

TITLE: Figure 3a:

GCN Pond and Ditch Survey Results
Page 5 of 6

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439600 439400 439200 439000 438800 438600 438400 438200 438000 437800 437600 437400

Ditch 1

Pond A

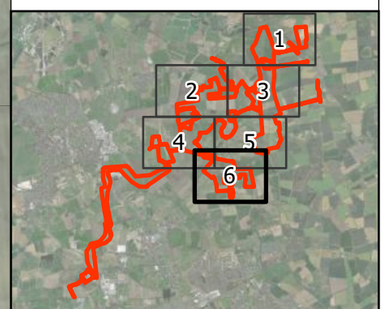
Pond B

Legend:

- Order limits
- Watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative



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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3a:

GCN Pond and Ditch Survey Results
Page 6 of 6

0 100 200 300
Metres
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502500 503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000 508500 509000

439000 438500 438000 437500 437000 436500 436000 435500 435000 434500 434000

GCCR-4
GCCR-3
GCCR-1
GCCR-8
GCCR-5
GCCR-6
GCCR-7
GCCR-2
GCCR-10
GCCR-9
GCCR-11
GCCR-12
GCCR-13

Legend:

- Order limits
- Grid connection cable route 250m buffer
- Pond location

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Peartree Hill Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3b:

Cable Route Pond Locations

0 250 500 750
Metres
SCALE: 1:20,000 @ A3

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454000 452000 450000 448000 446000 444000 442000 440000 438000 436000 434000 432000 430000 428000 426000 424000

Greater Wash SPA

Hornsea Mere SPA

Humber Estuary SPA, SAC and Ramsar

Legend:

- Order limits
- 10km buffer
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4a:

Internationally Designated Sites within 10km

0 1 2 3 Kilometers

SCALE: 1:120,000 @ A3

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445000 444000 443000 442000 441000 440000 439000 438000 437000 436000 435000 434000 433000

Leven Canal SSSI

Beverley Parks LNR

Legend:

- Order limits
- 2km buffer
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)

Indicative Location of Non-statutory Sites

- Arnold Drain LWS
- Cote Wood LWS
- Figham Pastures LWS
- Meaux LWS (start and end points)

Rev	Date	Description	Drn	Chk	App
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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4b:

Designated Sites Within 2km and Indicative Locations of Non-Statutory Sites

0 500 1,000 1,500

Metres

SCALE: 1:50,000 @ A3

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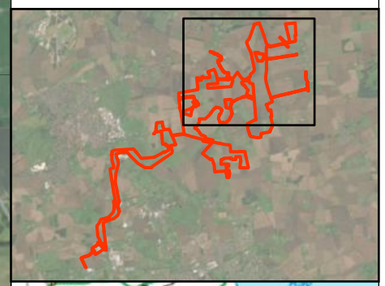
508000 508200 508400 508600 508800 509000 509200 509400 509600 509800 510000 510200 510400 510600 510800 511000 511200 511400 511600 511800 512000 512200 512400 512600 512800

443800 443600 443400 443200 443000 442800 442600 442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400 440200 440000 439800

H2
H15
H23
H27
H24
H25
H13
H12
H7
H18
H11
H17
H10

Legend:
- Order limits
- Important hedgerow
- Potentially important hedgerow
- Hedgerow assessed as not important
- Hedgerow survey location



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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 5:

Important Hedgerows
Page 1 of 3

0 200 400 600
Metres
SCALE: 1:15,000 @ A3

N W E S

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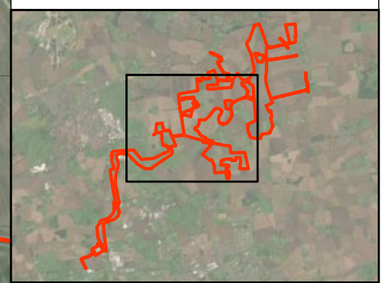
H23 H27 H25 H24 H13 H7 H12 H26 H11 H17 H10 H4 H5 H6 H9 H8 H14 H22 H21 H20 H16 H28 H1 H19 H3

Legend:

- Order limits
- Important hedgerow
- Potentially important hedgerow
- Hedgerow assessed as not important
- Hedgerow survey location



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00	13/12/2024	2485116	RTJ	HD	LW

Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 5:

Important Hedgerows
Page 2 of 3

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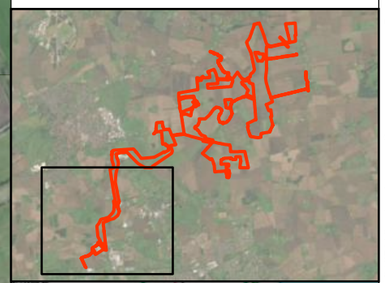
H29

H30

Legend:

- Order limits
- Important hedgerow
- Potentially important hedgerow
- Hedgerow assessed as not important
- Hedgerow survey location



Rev	Date	Description	Drn	Chk	App
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Peartree Hill Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 5:

Important Hedgerows
Page 3 of 3

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APPENDIX A – TARGET NOTES

The locations of the following target notes (TN) are shown in **Figure 2 UKHab Habitat survey (CONFIDENTIAL)**.

TN1	A pond, located in an arable field, holds very little water and has been dry lately. However, it could support breeding amphibians during the breeding season. Water mint (*Mentha aquatica*) may be suitable for egg-laying. Marsh horsetail (*Equisetum palustre*) covers 100% of the pond. Marginal vegetation includes Water Mint, Soft-rush (*Juncus effusus*), Iris (*Iris pseudacorus*), and Sharp Rush (*Juncus acutus*). The banks are unmanaged and covered with tall vegetation, including Lesser Trefoil (*Trifolium dubium*), Bird Vetch (*Vicia cracca*), Creeping Thistle (*Cirsium arvense*), Ragwort (*Senecio jacobaea*), Dock (*Rumex* spp.), and Red Clover (*Trifolium pratense*). There is some scattered Willow (*Salix* spp.) scrub and a large area of Bramble (*Rubus fruticosus*) along one edge.
TN2	A ditch with a c.2 m wide channel. The water appeared to be strongly eutrophic with algae and scum on the surface. However, where not dominated by Common Reed (*Phragmites australis*) there was a range of aquatic species including abundant Branched Bur-reed (*Sparganium erectum*), frequent Common Reed, Soft-rush (*Juncus effusus*), and Hedge Bindweed (*Calystegia sepium*) and rarely encountered Water-plantain (*Alisma plantago-aquatica*) and Broad-leaved Pondweed (*Potamogeton natans*).
TN3	Semi-mature Sycamore (*Acer pseudoplatanus*) woodland with occasional Pedunculate Oak (*Quercus robur*) just off Hornsea Road (A1035). There was a patchy Bramble (*Rubus fruticosus* agg.) and Elder (*Sambucus nigra*) shrub layer with little to no ground-flora present.
TN4	Long line of semi-mature to mature trees going north then east through crop fields. The north-south line was almost exclusively Ash (*Fraxinus excelsior*), with the east-west line being dominated by Pedunculate Oak (*Quercus robur*) with occasional Horse-chestnut (*Aesculus hippocastanum*), Ash and Elder (*Sambucus nigra*). No Ground-level tree assessment for roosting bats was carried out at the time due to over 100 trees being present.
TN5	A barn owl box on large Ash (*Fraxinus excelsior*) tree on field boundary.
TN6	[redacted] The large drainage ditch contained a large amount of Reed Sweet-grass (*Glyceria maxima*), Meadowsweet (*Filipendula ulmaria*) and Common Reed (*Phragmites australis*).
TN7	A small area of young woodland at the intersection of four fields and some ditches. The most common tree species are Wild Cherry (*Prunus avium*), Beech (*Fagus sylvatica*) and Pedunculate Oak (*Quercus robur*) with a sparse understorey of Elder (*Sambucus nigra*). The ground-flora was dominated by Common Nettle (*Urtica dioica*).

TN8	A moderately species-poor area of modified grassland (up to eight or nine species/m^2) but with a range of species scattered throughout. The short grassland was dominated by a mix of Perennial Rye-grass (*Lolium perenne*) and Yorkshire-fog (*Holcus lanatus*) with Meadow Buttercup (*Ranunculus acris*) and White Clover (*Trifolium repens*). However, also occasionally or rarely present were Red Fescue (*Festuca rubra*), Lesser Trefoil (*Trifolium dubium*), Common Sorrel (*Rumex acetosa*), Spear Thistle (*Cirsium vulgare*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Meadow Vetchling (*Lathyrus pratensis*) and Lady's Bedstraw (*Galium verum*).
TN9	A barn owl box on an Ash (*Fraxinus excelsior*) tree over a minor, wet ditch. The box is at other side of the tree from the Order Limits, facing away.
TN10	A strip of sown grassland with abundant False Oat-grass (*Arrhenatherum elatius*), Crested Dog's-tail (*Cynosurus cristatus*), Creeping Thistle (*Cirsium arvense*) and Creeping Bent (*Agrostis stolonifera*). Frequent species included Yorkshire-fog (*Holcus lanatus*), Common Knapweed (*Centaurea nigra*) and Lady's Bedstraw (*Galium verum*). Occasional to rare species included Yarrow (*Achillea millefolium*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Ragwort (*Jacobaea vulgaris*), Oxeye Daisy (*Leucanthemum vulgare*), Red Fescue (*Festuca rubra*), Hedge Bedstraw (*Galium mollugo*), Dandelion (*Taraxacum* agg.), Creeping Buttercup (*Ranunculus repens*) and Lesser Trefoil (*Trifolium dubium*).
TN11	Approximately 10-year-old, planted mixed woodland with Pedunculate Oak (*Quercus robur*), Wild Cherry (*Prunus avium*), Ash (*Fraxinus excelsior*) and a line of European Larch (*Larix decidua*) and Rowan (*Sorbus aucuparia*) to the west. The patchy ground flora mostly included Common Nettle (*Urtica dioica*), Ground-ivy (*Glechoma hederacea*) False Brome (*Brachypodium sylvaticum*) and Cock's-foot (*Dactylis glomerata*) with Ash and Hawthorn (*Crataegus monogyna*) saplings. Other species included Cow Parsley (*Anthriscus sylvestris*), Hogweed (*Heracleum sphondylium*), Rough Chervil (*Chaerophyllum temulum*) and Herb-Robert (*Geranium robertianum*).
TN12	Fallow field with stubble. Groundsel (*Senecio vulgaris*) was abundant, Hoary Willowherb (*Epilobium parviflorum*) frequent and other common weeds occasional such as Field Horsetail (*Equisetum arvense*), American Willowherb (*Epilobium ciliatum*), Smooth Sow-thistle (*Sonchus oleraceus*), Great Willowherb (*Epilobium hirsutum*) and Hedge Mustard (*Sisymbrium officinale*).
TN13	Plantation of fir saplings (*Abies* sp.) with abundant weeds including Common Poppy (*Papaver rhoeas*), Perennial Sow-thistle (*Sonchus arvensis*) and Creeping Thistle (*Cirsium arvense*).
TN14	Routh and Meaux Drain where it passes into the Order limits. The ditch is wide (over 5 m from the top of each bank) but only had a thin (*c*.1 m) channel of shallow water at the time of the survey, with dense, grassy marginal vegetation throughout, dominated by Reed Canary-grass (*Phalaris arundinacea*) and Common Reed (*Phragmites australis*). Wild Angelica (*Angelica sylvestris*) and Meadowsweet (*Filipendula ulmaria*) were also

	frequent. The tops of the banks supported MG1 *Arrhenatherum elatius* grassland with frequent Common Knapweed (*Centaurea nigra*).
TN15	One of the few ditches in this area with a relatively more species-rich mix of more open grassland on the banks compared to other ditches across the Order Limits. However, scattered scrub with Bramble (*Rubus fruticosus* agg.), Hawthorn (*Crataegus monogyna*), Wych Elm (*Ulmus glabra*) and Common Nettle (*Urtica dioica*) were still occasional. The grassland can be classified as MG1 *Arrhenatherum elatius* grassland with frequent to abundant Common Knapweed (*Centaurea nigra*). Other species included Crosswort (*Cruciata laevipes*), Field Bindweed (*Convolvulus arvensis*), Common Couch (*Elymus repens*), Tufted Vetch (*Vicia cracca*), Common Reed (*Phragmites australis*), Meadow Vetchling (*Lathyrus pratensis*), Lesser Trefoil (*Trifolium dubium*), Ribwort Plantain (*Plantago lanceolata*), Cat's-ear (*Hypochaeris radicata*) and most notably, Fairy Flax (*Linum catharticum*).
TN16	A diffuse boundary between the 3-4 m wide track of modified grassland and woodland edge with overhanging branches of Deodar (*Cedrus deodara*), Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*) with a ground flora of Common Reed (*Phragmites australis*) and Common Nettle (*Urtica dioica*). Multiple trees have features suitable for roosting bats. The grassland on the track was dominated by Perennial Rye-grass (*Lolium perenne*), with Greater Plantain (*Plantago major*), Dandelion (*Taraxacum* agg.) and White Clover (*Trifolium repens*).
TN17	A small area of reedbed (dry at the time of the survey) with Common Reed (*Phragmites australis*) and scattered Grey Willow (*Salix cinerea*). The area is surrounded by tall, dense scrub dominated by Bramble (*Rubus fruticosus* agg.) with Common Nettle (*Urtica dioica*) and Large Bindweed (*Calystegia silvatica*).
TN18	A small area of young to mature Pedunculate Oak (*Quercus robur*) and Ash (*Fraxinus excelsior*) woodland with an understorey of Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), a species of elm (*Ulmus* species) and saplings of Ash, Alder (*Alnus glutinosa*) and Horse-chestnut (*Aesculus hippocastanum*). The ground flora is species poor with Bramble (*Rubus fruticosus* agg.), Cleavers (*Galium aparine*), Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*), Red Campion (*Silene dioica*), Hogweed (*Heracleum sphondylium*), Ground-ivy (*Glechoma hederacea*) and Lords-and-Ladies (*Arum maculatum*). Several trees have potential for roosting bats.
TN19	A relatively large block of woodland with similarly aged, semi-mature Sycamore (*Acer pseudoplatanus*) and Scots Pine (*Pinus sylvestris*) with no understorey aside from a scattering of Sycamore saplings and line of Hawthorn (*Crataegus monogyna*) along northern boundary. The species-poor ground flora included Yorkshire-fog (*Holcus lanatus*), Common Nettle (*Urtica dioica*) and Red Campion (*Silene dioica*).
TN20	A small block of mostly young woodland with some mature Pedunculate Oak (*Quercus robur*) and semi-mature Ash (*Fraxinus excelsior*). The younger trees included European Larch (*Larix decidua*), Common Whitebeam (*Sorbus aria*), Field Maple (*Acer campestre*), Rowan (*Sorbus aucuparia*) and

	Norway Maple (*Acer platanoides*). There was an understorey/edge of Hawthorn (*Crataegus monogyna*), under which was Common Nettle (*Urtica dioica*), Ash saplings, Wood Avens (*Geum urbanum*) and False Brome (*Brachypodium sylvaticum*).
TN21	A moderately species-rich wildflower margin with a range of species including Alsike Clover (*Trifolium hybridum*), White Clover (*Trifolium repens*), Red Clover (*Trifolium pratense*), Crimson Clover (*Trifolium incarnatum* ssp. *incarnatum*), Creeping Thistle (*Cirsium arvense*), Phacelia (*Phacelia tanacetifolia*), Perennial Sow-thistle (*Sonchus arvensis*), Prickly Sow-thistle (*Sonchus asper*), Cornflower (*Centaurea cyanus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Wild Carrot (*Daucus carota* ssp. *carota*), Fool's Parsley (*Aethusa cynapium*) and Common Poppy (*Papaver rhoeas*).
TN22	A wide fallow strip with abundant Creeping Thistle (*Cirsium arvense*) and a few other common weeds.
TN23	One of only two species-rich hedges well within the Order Limits, likely species-rich due to the fairly recent planting of gaps with a variety of species, many of which appeared less than 10 years old. The hedge was *c*.2.1 m tall and wide with Hawthorn (*Crataegus monogyna*) being most frequent but other species including Blackthorn (*Prunus spinosa*), Sweet-briar (*Rosa rubiginosa*), Guelder-rose (*Viburnum opulus*), Ash (*Fraxinus excelsior*), Pedunculate Oak (*Quercus robur*), Field Maple (*Acer campestre*) and Southern Dogwood (*Cornus sanguinea* ssp. *australis*). There is also a mature Pedunculate Oak close to the centre of the hedge. The ground flora was dominated by Cleavers (*Galium aparine*) but also included Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*) and occasional Common Reed (*Phragmites australis*), despite there being no obvious ditch. There is no margin to the north as the hedge is along a track, but there was a 1 m strip of disturbed MG1 *Arrhenatherum elatius* grassland to the south.
TN24	The boundary of the Order Limits where it is adjacent to Cote Wood Local Wildlife Site. The mature Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*) woodland also included Sycamore (*Acer pseudoplatanus*), Scots Pine (*Pinus sylvestris*) and European Larch (*Larix decidua*) with an understorey of Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*), old, coppiced Hazel (*Corylus avellana*), Field Maple (*Acer campestre*) and Honeysuckle (*Lonicera periclymenum*). The understorey appeared to include Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*), Bramble (*Rubus fruticosus* agg.), Red Campion (*Silene dioica*), Wood Avens (*Geum urbanum*) and False Brome (*Brachypodium sylvaticum*). The woodland is somewhat separated from the Order Limits by a mostly dry ditch with Bramble.
TN25	A very shallow pond with a species of Water-starwort (*Callitriche* species) within young to semi-mature woodland by the side of the road. Ash (*Fraxinus excelsior*) and Hybrid Black-poplar (*Populus* × *canadensis*) are the most common tree species with Sycamore (*Acer pseudoplatanus*) and Pedunculate Oak (*Quercus robur*) also present. Scrub in the centre and as an understorey includes Hawthorn (*Crataegus monogyna*), Norway Spruce

	(*Picea abies*), Beech (*Fagus sylvatica*), Dogwood (*Cornus sanguinea*), Blackthorn (*Prunus spinosa*) and Bramble (*Rubus fruticosus* agg.). The ground flora was dominated by Ivy (*Hedera helix*) in most places but also included Cleavers (*Galium aparine*), Common Nettle (*Urtica dioica*) and Hogweed (*Heracleum sphondylium*).
TN26	Meaux West Drain where it crosses the Order Limits. Vegetation in the wide, damp ditch is dominated by Common Reed (*Phragmites australis*) with Wild Angelica (*Angelica sylvestris*) and infrequent Hemp Agrimony (*Eupatorium cannabinum*). The banks are covered in variable grassland dominated by False Oat-grass (*Arrhenatherum elatius*) with some Meadow Vetchling (*Lathyrus pratensis*) and Common Knapweed (*Centaurea nigra*), in addition to patchy scrub, mostly Elder (*Sambucus nigra*), from a defunct hedge.
TN27	A long, winding, slightly gappy, variable species-rich hedge on the boundary close to the south of the Order Limits. Blackthorn (*Prunus spinosa*) is perhaps the most abundant species, with others including Hawthorn (*Crataegus monogyna*), Field Maple (*Acer campestre*), Grey Willow (*Salix cinerea*), Spindle (*Euonymus europaeus*), Elder (*Sambucus nigra*), Hazel (*Corylus avellana*), a species of rose (*Rosa* species) and Spurge-laurel (*Daphne laureola*). There are also several trees along the hedge including mature Pedunculate Oaks (*Quercus robur*) and young to semi-mature Ash (*Fraxinus excelsior*). There is also a 1m-deep, mostly dry ditch with scrub and common herbs.
TN28	One of two internal, species-rich hedges within the Order Limits. The hedge was c.2.4m tall and 1.9m wide and only just species-rich, being mostly dominated by Hawthorn (*Crataegus monogyna*). However, there is a single, mature Pedunculate Oak (*Quercus robur*) and some younger oak trees throughout the hedge, and other woody species included Elder (*Sambucus nigra*), a species of rose (*Rosa* species), Blackthorn (*Prunus spinosa*) and Goat Willow (*Salix caprea*). A dry, internal ditch supported a species-poor ground flora of Bramble (*Rubus fruticosus* agg.), Common Nettle (*Urtica dioica*), Cleavers (*Galium aparine*) and Great Willowherb (*Epilobium hirsutum*).
TN29	A pond at the south-eastern edge of a large area of planted scrub. The pond had abundant marginal vegetation with Reed Canary-grass (*Phalaris arundinacea*), Bulrush (*Typha latifolia*) and Reed Sweet-grass (*Glyceria maxima*). The scrub, planted in the recent past for game cover includes a wide range of mostly native, but also non-native woody species and paths of mown, modified grassland cutting through it. Species include Bramble (*Rubus fruticosus* agg.), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Wild Privet (*Ligustrum vulgare*), Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*), Rowan (*Sorbus aucuparia*), Buckthorn (*Rhamnus catharticus*), Guelder-rose (*Viburnum opulus*), Snowberry (*Symphoricarpos albus*), Coralberry (*Symphoricarpos orbiculatus*), and Southern Dogwood (*Cornus sanguinea* ssp*. australis*).
TN30	A strip of planted scrub with a path cut through, very similar to the scrub described in **Target Note 29**.

TN31	A small field with tall, rank, species-poor grassland. The grassland appeared to be maintained for the pheasants which were being reared within an enclosure in the field. Cock's-foot (*Dactylis glomerata*) is dominant with frequent species including Spear Thistle (*Cirsium vulgare*), Broad-leaved Dock (*Rumex obtusifolius*) and Common Ragwort (*Jacobaea vulgaris*). Reed Canary-grass (*Phalaris arundinacea*) and Chicory (*Cichorium intybus*), present in the margins of the field, were also occasional in the grassland.
TN32	A field planted with the young saplings of a fir species (*Abies* sp.) and an abundance of several common arable weeds including Common Poppy (*Papaver rhoeas*), Great Willowherb (*Epilobium hirsutum*), Perennial Rye-grass (*Lolium perenne*), Creeping Thistle (*Cirsium arvense*), Black-grass (*Alopecurus myosuroides*), Equal-leaved Knotgrass (*Polygonum arenastrum*), and Perennial Sow-thistle (*Sonchus arvensis*).
TN33	An area to the southern tip of the Order Limits which was not within the red-line boundary at the time of the survey. It appears to be a small, triangular field of improved grassland surrounded on all sides by hedgerows.
TN34	12 dead trees at the end of the hedgerow.
TN35	Area dominated by Hard Rush (*Juncus inflexus*).
TN36	Recently cleared river bank vegetation. Looks like a pipe was installed.
TN37	Area of bare ground underneath a line of trees where horses take shelter.
TN38	Area dominated by Hard Rush (*Juncus inflexus*).
TN39	Adjacent habitats assessed from a distance due to a dangerous cow in the field.
TN40	Group of mature Hawthorn (*Crataegus monogyna*) trees that may be suitable for roosting bats.
TN41	Pond in an arable field with unmanaged banks, holding very little water but has been dry lately. The pond could support breeding amphibians during the breeding season. Water Mint (*Mentha aquatica*) is present suitable for egg laying. The pond is covered with 100% Marsh Horsetail (*Equisetum palustre*). Marginal vegetation includes Water Mint, Soft Rush (*Juncus effusus*) and Iris (*Iris sibirica*). Tall vegetation includes Lesser Trefoil (*Trifolium dubium*), Bird Vetch (*Vicia cracca*), Creeping Thistle (*Cirsium arvense*), Ragwort (*Jacobaea vulgaris*), Cocksfoot (*Dactylis glomerata*), Curled Dock (*Rumex crispus*), scattered Willow scrub (*Salix* spp.), Red Clover (*Trifolium pratense*), and a large area of Bramble (*Rubus fruticosus*) on one edge..
TN42	Crossing point
TN43	No access granted to this area
TN44	No access granted to this area
TN45	No access granted to this area
TN46	No access granted to this area
TN47	No access granted to this area
TN48	No access granted to this area

TN49	No access granted to this area
TN50	Arnold Drain LWS location

APPENDIX B – NATURE CONSERVATION LEGISLATION AND POLICY

International Legislation

The following international conventions and directives apply to biodiversity protection in the UK. Post-'Brexit', even though European Union (EU) directives no longer directly apply to the UK, the provisions therein are enshrined in both domestic legislation and international agreements. Legislation has been enacted to ensure the regulations derived from these remain in force[4].

The Convention on Biological Diversity 1992 *et seq.*

This multilateral treaty, signed by 150 government leaders at the 1992 Rio Earth Summit, has three main goals, of which one is the conservation of biological diversity. Article 6 requires countries to develop national biodiversity strategies, plans or programmes. In response, the UK developed the UK Biodiversity Action Plan (BAP) 1994 as well as county-specific BAPs. Subsequent to this, parties of the convention agreed the supplementary Nagoya Protocol 2010, adopting the Strategic Plan for Biodiversity 2011-2020. The purpose of this Strategic Plan was to provide a framework for establishing national and regional biodiversity targets.

Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive) 2009

https://www.legislation.gov.uk/eudr/2009/147

The Birds Directive 2009 relates to the conservation of all species of naturally occurring birds in their wild state in the territory of the EU Member States (MSs) to which the treaty applies. Under the Birds Directive, the most suitable areas of conservation of the Annex I species are to be designated as Special Protection Areas (SPAs), as part of the European Natura 2000 network. Post Brexit, SPAs are no longer considered part of Natura 2000 and are instead components of the UK's 'national site network', but their highly protected status is unchanged. Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to fulfil the commitment made by government to maintain environmental protections and continue to meet the UK's international legal obligations.

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) 1992

https://www.legislation.gov.uk/eudr/1992/43

The Habitats Directive 1992 requires EU MSs to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed under Annex I, II, IV and/or V. Species listed under Annex IV

[4] Further information relating to England and Wales can be found here: https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017. A similar exercise has been undertaken in Scotland and Northern Ireland.

are known as 'European Protected Species' (EPS), and have retained their protected status in UK domestic legislation post-Brexit.

Under the Habitats Directive, EU Member States are required to contribute to the Natura 2000 network through the designation of Special Areas of Conservation (SACs) for natural habitat types listed in Annex I and habitats of species listed in Annex II. Post Brexit, SACs are no longer considered part of the European Natura 2000 network and are instead components of the UK's 'national site network', but their highly protected status is unchanged.

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971: the Ramsar Convention

Accessible via https://jncc.gov.uk/our-work/ramsar-convention/

The Ramsar Convention is an intergovernmental treaty focused on the conservation and sustainable use of wetland, primarily as habitats for water birds. Under the convention, each ratified country is required to identify and designate sites (Ramsar sites) that meet the criteria for identifying a wetland of international importance, i.e. containing representative, rare or unique wetland types. In addition, the convention promotes international co-operation to promote the wise use of all wetlands and their resources.

Habitats Regulations Assessment (HRA): a note

There is a requirement under the EU nature directives, and enshrined in country-specific domestic legislation[5] (see below), to undertake a screening exercise to determine whether any sites that form part of the 'national site network' (formerly Natura 2000) are likely to be significantly affected by any proposal (project or plan). The assessment must consider the proposals alone and also in combination with other plans and projects, if they result from activities that are not directly connected with, or necessary to, the management of the designated sites. If significant effects are likely, an Appropriate Assessment (AA) will need to be carried out. The screening, any AA, and any subsequent assessment, are collectively known as a Habitats Regulations Assessment (HRA). The HRA needs to take into account each of the 'Qualifying Features' (habitats or species) that justified the Site being designated. Ramsar sites are treated in the same way as SACs and SPAs in HRAs, as are sites which have not been fully adopted i.e. candidate SACs (cSACs) and potential SPAs (pSPAs).

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979

Accessible via**:** https://jncc.gov.uk/our-work/the-convention-on-the-conservation-of-migratory-species-of-wild-animals/#convention-summary

The Bonn Convention was adopted in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix I of the Convention), concluding multilateral agreements for the conservation and

[5] In England and Wales: the Conservation of Habitats and Species Regulations 2017 (as amended).

management of migratory species which require or would benefit from international cooperation (listed in Appendix II), and by undertaking cooperative research activities. The UK Government ratified the Bonn Convention in 1985. The current legally-binding Agreements under the Convention include EUROBATS[6].

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979
https://www.coe.int/en/web/bern-convention

The principal aims of the Bern Convention 1979 are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end, the Bern Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species. The UK Government ratified the Bern Convention in 1982.

National Legislation

The following pieces of domestic legislation apply to biodiversity protection in the UK.

The Wildlife and Countryside Act (WCA) 1981
https://www.legislation.gov.uk/ukpga/1981/69

The Wildlife and Countryside Act 1981 (as amended) is the primary piece of legislation relating to nature conservation in the UK, though it has been adapted in different ways in the devolved administrations. It was initially enacted to implement the Bern Convention, Bonn Convention and the Birds Directive (described above).

The act is supplemented by provisions in the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities (NERC) Act 2006. In addition to the Habitat Regulations (described below), the WCA provides protection for species listed in Schedules 1 (birds), 5 (other animals) and 8 (plants) of the Act. It provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) in England and Wales[7]. It also sets out, in other schedules, important and invasive species which are legally protected or require management.

All species of bird are protected under the WCA. The legislation makes it an offence to intentionally:

- kill, injure or take any wild bird;
- take, damage, or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

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6 More information available at https://jncc.gov.uk/our-work/agreement-on-the-conservation-of-populations-of-european-bats-eurobats

7 Duty replaced by the Nature Conservation (Scotland) Act 2004 (as amended) and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended) in those countries.

Those species of birds listed on Schedule 1 of the WCA are afforded additional protection, which deems it an offence to intentionally or recklessly:

- disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
- disturb dependent young of such a bird.

Under Section 9 of the WCA, for animals listed on Schedule 5, it is an offence in England and Wales to intentionally or recklessly:

- kill, injure or take any wild animal listed on Schedule 5*;
- possess or control any live or dead those wild animals or anything derived from it*;
- damage or destroy any structure or place which wild animals listed on Schedule 5 uses for shelter or protection*;
- disturb any such animal while it is occupying a structure or place of shelter or protection;
- obstruct access to any structure or place used by any such animal for shelter or protection; and
- sell, offer or expose for sale, or have in their possession or transports for the purpose of sale, any live or dead wild animal listed on Schedule 5 or any part of, or anything derived from such an animal.

As noted above, there are minor differences between the offences in England and Wales outlined above, and those in Scotland / Northern Ireland. The three clauses marked with asterisks do not apply to EPS in England and Wales, as these offences are included in the 'Habitats Regulations' (see below). In addition, the Wildlife and Countryside Act 1981 is no longer relevant to EPS in Scotland or Northern Ireland, which instead are afforded full protection by the 'Habitats Regulations' (see below).

In addition to EPS, species commonly found on development sites include water voles (*Arvicola amphibius*) and widespread species of reptiles: common lizard (*Zootoca vivipara*); slow-worm (*Anguis fragilis*); grass snake (*Natrix helvetica*); and adder (*Vipera berus*). These four reptile species receive partial protection, which prevents the intentional or deliberate killing and injuring of reptiles or offering them for sale.

Section 14(2) states that it is an offence to plant or otherwise cause to grow any plant in the wild at a place outside its native range.

Section 16(i) of the Act makes provision for derogation licences to be issued *"for the purposes of preserving public health or public … safety"*. For confirmation of this, it would be appropriate to consult the relevant statutory nature conservation body (SNCB)[8].

Until recently, there has been no provision within the Act for derogation licences to be issued for the purposes of development, although Section 10 provides a defence in cases that may be considered to be: *"the incidental result of a lawful operation and could not reasonably have been avoided"* if certain conditions are met.

[8] SNCBs are - in England: Natural England.

As a result of the Environment Act 2021, the introduction of the 'overriding public interest' ('OPI') test was added to the licensing purposes in the WCA, from October 2022, though this only applies in England.

The Conservation of Habitats and Species Regulations (Habitat Regulations) 2017

https://www.legislation.gov.uk/uksi/2017/1012 England and Wales

The Habitats Regulations 2017 consolidated the various amendments made to the 1994 Habitat Regulations, which were developed to implement the Birds Directive and Habitats Directive (see above) at a national level, though this consolidation only applies in England and Wales. As noted above, in Scotland and in Northern Ireland, the original versions of the Regulations in each region have been retained and amended to include protections for EPS that were initially provided under the WCA (or its equivalent).

The Regulations (as amended) provide for the designation and protection of the national site network (formerly 'Natura 2000 sites'), the adaptation of planning and other controls for those sites, and the protection of EPS (listed on Schedules 2 and 5).

The 2017 Regulations (England and Wales, Reg. 43) deems it an offence to:

- deliberately capture, injure or kill a wild animal of an EPS,
- deliberately disturb wild animals of any such species,
- deliberately take or destroy the eggs of such an animal, or
- damage or destroy a breeding site or resting place of such an animal.

For the purposes of paragraph (b), disturbance of animals includes in particular any disturbance which is likely to:

- impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- to affect significantly the local distribution or abundance of the species to which they belong.

There are also restrictions on transport, possession and sale.

It is possible to obtain a derogation licence from the relevant SNCB[8] to permit activities which would otherwise contravene the regulations above, including for development purposes, when certain conditions are met. Failure to satisfy the Regulations and obtain a licence where required could result in prosecution and lead to fines and possible imprisonment.

Currently (2021), all EPS are also listed on Schedule 5 of the WCA (outlined above), as it applies in England and Wales, though only some clauses of the WCA apply (Section 9 4(b), (c) and 5). EPS often encountered on development sites include GCN (*Triturus cristatus*), all species of bats, dormice (*Muscardinus avellanarius*) and otters (*Lutra lutra*).

Countryside and Rights of Way Act 2000
https://www.legislation.gov.uk/ukpga/2000/37

The Countryside and Rights of Way (CRoW) Act 2000 provides for public access on foot to certain land types, amends the law for public rights of way, increases protection for SSSIs, and strengthens wildlife enforcement legislation. It applies only in England and Wales.

The Natural Environment and Rural Communities (NERC) Act 2006;
https://www.legislation.gov.uk/ukpga/2006/16

The Natural Environment and Rural Communities (NERC) Act 2006, Section 40 requires that any public body or statutory undertaker in England must have regard to the purpose of conservation of biological diversity in a manner that is consistent with the exercise of their normal functions. This may include enhancing, restoring or conserving a population or a habitat. The intention is to help ensure that biodiversity becomes an integral consideration in the development of policies, and that decisions of public bodies work with the grain of nature and not against it.

As part of this duty, statutory undertakers must have regard to the list of habitats and species which are of principal importance for the purpose of maintaining and enhancing biodiversity. For England, the duty to compile such a list is captured under Section 41 of the NERC Act. The lists for England are accessible online via the National Archive[9].

The Hedgerows Regulations 1997
https://www.legislation.gov.uk/uksi/1997/1160/made

The Hedgerows Regulations 1997 provide protection for 'important' hedgerows for which replanting is not a substitute. The 'importance' of a hedgerow depends upon several archaeological, wildlife and landscape criteria (which are outlined in the regulations). The regulations deem it an offence to remove an 'important hedgerow' without prior notification to the relevant local planning authority.

Protection of Badgers Act 1992
https://www.legislation.gov.uk/ukpga/1992/51

Badgers and their setts are protected under the Protection of Badgers Act 1992 (England, Wales and Scotland). The key part of this legislation in relation to the proposed development is in Section 3, which deems it an offence to:

- damage a badger sett or any part of it;
- destroy a badger sett;
- obstruct access to, or any entrance of, a badger sett;
- cause a dog to enter a badger sett;
- disturb a badger when it is occupying a badger sett,

9 https://webarchive.nationalarchives.gov.uk/ukgwa/20140712055944/http:/www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

whether intending to do any of those things or be reckless as to whether those actions would have any of the consequences listed above.

Derogation licences may be obtained from the relevant SNCB[8] under Section 10 of the Act for the purpose of development, to permit activities which would otherwise be unlawful.

Note: there are additional provisions relating to badgers under the WCA Section 11 (Prohibition of certain methods of killing or taking wild animals).

The Wild Mammals (Protection) Act 1996
https://www.legislation.gov.uk/ukpga/1996/3

All wild mammals are protected by The Wild Mammals (Protection) Act 1996 (as amended). This makes it an offence to mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal.

Invasive Alien Species (Enforcement and Permitting) Order 2019
(https://www.legislation.gov.uk/uksi/2019/527/contents/made)

The Invasive Alien Species (Enforcement and Permitting) Order applies principally in England and Wales and the UK's offshore marine area, but also controls imports and exports from the UK (including Scotland and Northern Ireland). It lists species of concern which cannot be imported, kept, bred/grown, transported, sold, used, allowed to reproduce, or released into the environment.

National, regional and local policy and guidance of relevance

Planning policy relating to ecology and nature conservation is set out below.

National Planning Policy Framework 2024

Access via: https://www.gov.uk/government/publications/national-planning-policy-framework--2

The National Planning Policy Framework (NPPF) sets out the Government's planning policy in England at the national level. It does not contain specific policies for nationally significant infrastructure projects, which are determined in accordance with the decision-making framework in the PA 2008 and relevant National Policy Statements for major infrastructure, as well as any other matters that are relevant (which may include the NPPF). Section 15 of the NPPF specifies the requirements for conserving and enhancing the natural environment through the planning and development process to minimise impacts on habitats and biodiversity.

Planning Practice Guidance

Accessed via: https://www.gov.uk/government/collections/planning-practice-guidance

The Planning Practice Guidance is a web-resource to support the NPPF, including guidance for Environmental Impact Assessments (https://www.gov.uk/guidance/environmental-impact-assessment) and the Natural

Environment (https://www.gov.uk/guidance/natural-environment). The guidance for the Natural Environment explains key issues in implementing the NPPF to protect and enhance the natural environment, including local requirements. The guidance outlines what evidence needs to be taken into account in preparing planning applications to identify and map local ecological networks. It also outlines how biodiversity can be taken into account in preparing a planning application.

Government's 25-Year Environment Plan 2018
Accessed via: https://www.gov.uk/government/publications/25-year-environment-plan

The Government's 25-Year Environment Plan 2018 sets out how the UK Government intends to improve the natural health of the UK through improving land, air and water quality, as well as setting out how the effects of climate change will be tackled. The plan promotes the creation or restoration of wildlife-rich habitat outside the protected site network and seeks to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England. The plan sets out a number of goals and corresponding policies that look at managing land sustainably, improving and enhancing landscapes and biodiversity for both marine and terrestrial environments, improving resource efficiency and reducing waste and pollution, whilst also examining the UK's contribution to improving the global environment.

APPENDIX C – PROTECTED AND NOTEWORTHY SPECIES RECORDS

Table 8 displays protected species records that are located within 1 km of the Land Areas B-F and **Table 9** displays notable species records within 1 km of the Land Areas B-F. **Table 10** and **Table 11** display protected and notable species records within 1 km of the grid connection cable route. These species records were obtained from the North & East Yorkshire Ecological Data Centre. The scientific and common names for species are given as well as their level of designation. A glossary defining abbreviations used in the table is given in **Table 12**, **Appendix D**. If a species is not included in the table below it does not necessarily mean the species is absent from the search area, but that data-holding organisations do not have records of it in these locations.

Table 8: Protected species records within 1 km of Land Areas B-F and interconnecting cable routes

Latin Name	Common Name	Designation	Most Recent record	Any Records in 100m
Birds				
Numenius phaeopus	whimbrel	WCA1.1, Red, GB RDB(CR)	2007	
Tringa ochropus	green sandpiper	WCA1.1, Amber, GB RDB(EN)	2012	
Tyto alba	barn owl	WCA1.1	2016	
Mammals				
Arvicola amphibius	European water vole	WCA5, S41, GB RDB(EN)	2006	
Meles meles	Eurasian badger	BA	2011	
Myotis mystacinus	whiskered bat	EPS(Sch2), WCA5	2016	
Pipistrellus sp.	a pipistrelle bat	EPS(Sch2), WCA5	1994	
Pipistrellus pipistrellus	common pipistrelle	EPS(Sch2), WCA5	2017	
Plecotus auritus	brown long-eared bat	EPS(Sch2), WCA5, S41	2014	
Vespertilionidae	unidentified bat	EPS(Sch2), WCA5	1986	
Reptiles				
Natrix helvetica	grass snake	WCA5, S41	2011	

Table 9: Noteworthy species records within 1 km of Land Areas B-F and interconnecting cable routes

Latin Name	Common Name	Designation
Amphibians		
Bufo bufo	common toad	WCA5, S41
Rana temporaria	common frog	WCA5
Birds		
Apus apus	swift	Red, GB RDB(EN)
Columba palumbus	woodpigeon	Amber
Emberiza citrinella	yellowhammer	S41, Red
Emberiza schoeniclus	reed bunting	S41, Amber
Falco tinnunculus	kestrel	Amber, GB RDB(VU)
Gallinago gallinago	snipe	Amber
Gallinula chloropus	moorhen	Amber, GB RDB(VU)
Scolopax rusticola	woodcock	Red, GB RDB(VU)
Tringa totanus	redshank	Amber, GB RDB(VU)
Troglodytes troglodytes	wren	Amber
Vanellus vanellus	lapwing	S41, Red, GB RDB(EN)
Fish		
Anguilla anguilla	European eel	S41, OSPAR
Invertebrates		
Satyrium w-album	white-letter hairstreak	WCA5, S41, GB RDB(EN)
Lichen		
Xanthoria ucrainica		NS
Mammals		
Erinaceus europaeus	West European hedgehog	S41, GB RDB(VU)
Plants		
Bromus secalinus	Rye brome	NS
Hyacinthoides non-scripta	Bluebell	WCA8
Oenanthe fistulosa	Tubular water-dropwort	S41, GB RDB(VU), ENG BSBI RDB(VU)
Pinus sylvestris	Scots pine	NS
Potamogeton friesii	Flat-stalked pondweed	GB RDB(VU), ENG BSBI RDB(VU), NS
Ranunculus arvensis	Corn buttercup	S41, GB RDB(CR), ENG BSBI RDB(EN)

Table 10: Protected species records within 1 km of the grid connection cable route.

Latin Name	Common Name	Designation	Most Recent record	Any Records in 100m
Birds				
Alcedo atthis	kingfisher	WCA1.1	2016	☒
Circus cyaneus	hen harrier	WCA1.1, S41, Red, GB RDB(VU)	2015	☒
Cygnus cygnus	whooper swan	WCA1.1, Amber, GB RDB(EN)	2017	
Numenius phaeopus	whimbrel	WCA1.1, Red, GB RDB(CR)	2007	☒
Tringa ochropus	green sandpiper	WCA1.1, Amber, GB RDB(EN)	2007	☒
Tyto alba	barn owl	WCA1.1	2016	☒
Mammals				
Arvicola amphibius	water vole	WCA5, S41, GB RDB(EN)	2019	
Lutra lutra	otter	EPS(Sch2), WCA5, S41	2012	
Meles meles	badger	BA	2016	
Myotis daubentonii	daubenton's bat	EPS(Sch2), WCA5	2016	
Myotis mystacinus	whiskered bat	EPS(Sch2), WCA5	1993	
Nyctalus noctula	noctule	EPS(Sch2), WCA5, S41	2017	
Pipistrellus	pipistrelle bat species	EPS(Sch2), WCA5	1998	☒
Pipistrellus pipistrellus	common pipistrelle	EPS(Sch2), WCA5	2017	
Vespertilionidae	unidentified bat	EPS(Sch2), WCA5	2003	
Reptiles				
Natrix helvetica	grass snake	WCA5, S41	2016	

Table 11: Noteworthy species records within 1 km of the grid connection cable route.

Latin Name	Common Name	Designation
Amphibians		
Bufo bufo	common toad	WCA5, S41
Lissotriton vulgaris	smooth newt	WCA5
Rana temporaria	common frog	WCA5

Latin Name	Common Name	Designation
Birds		
Anas crecca	teal	Amber
Apus apus	swift	Red, GB RDB(EN)
Chloris chloris	greenfinch	Red, GB RDB(EN)
Columba palumbus	woodpigeon	Amber
Emberiza citrinella	yellowhammer	S41, Red
Emberiza schoeniclus	reed bunting	S41, Amber
Gallinago gallinago	snipe	Amber
Linaria cannabina	linnet	S41, Red
Locustella naevia	grasshopper warbler	S41, Red
Perdix perdix	grey partridge	S41, Red, GB RDB(VU)
Pyrrhula pyrrhula	bullfinch	S41, Amber
Tringa totanus	redshank	Amber, GB RDB(VU)
Troglodytes troglodytes	wren	Amber
Vanellus vanellus	lapwing	S41, Red, GB RDB(EN)
Fish		
Anguilla anguilla	European eel	S41, OSPAR
Mammals		
Erinaceus europaeus	West European hedgehog	S41, GB RDB(VU)
Lepus europaeus	hare	S41
Plants		
Bromus secalinus	rye brome	NS
Catabrosa aquatica	whorl-grass	GB RDB(VU), ENG BSBI RDB(VU)
Groenlandia densa	opposite-leaved pondweed	GB RDB(VU), ENG BSBI RDB(VU)
Myriophyllum verticillatum	whorled water-milfoil	GB RDB(VU)
Onobrychis viciifolia	sainfoin	GB RDB(VU), ENG BSBI RDB(VU)
Potamogeton friesii	flat-stalked pondweed	GB RDB(VU), ENG BSBI RDB(VU), NS
Ranunculus flammula	lesser spearwort	GB RDB(VU), ENG BSBI RDB(VU)
Spergula arvensis	corn spurrey	GB RDB(VU), ENG BSBI RDB(VU)
Tilia platyphyllos	large-leaved lime	NS

APPENDIX D – ACRONYMS

Table 12: Glossary of abbreviations

Code	Full Title	Explanation
Amber	Amber list	Amber listed species have a population status in the UK of medium conservation concern.
BAP	Biodiversity action plan	A plan that identifies threats to significantly important species and habitats and sets out targets and actions to enhance or maintain biodiversity.
ENG BSBI RDB	A Vascular Plant Red List for England	A list published in 2014 by the Botanical Society of Britain and Ireland of the red list status of plants in England. Measured against standardised IUCN criteria.
ENG BSBI RDB(CR)	Critically endangered	A BSBI Red List designation for species at an extremely high risk of extinction.
ENG BSBI RDB(EN)	Endangered	A BSBI Red List designation for species at a very high risk of extinction.
ENG BSBI RDB(VU)	Vulnerable	A BSBI Red List designation for species at high risk of extinction.
EPS (Sch 2)	European protected species (Schedule 2)	European protected species of animals, listed on Schedule 2 of The Conservation of Habitats and Species Regulations 2017.
EPS (Sch 5)	European protected species (Schedule 5)	European protected species of plants, listed on Schedule 5 of The Conservation of Habitats and Species Regulations 2017.
GB RDB	Red data book species	Species identified in one of the UK Red Data 2001.
GB RDB(CR)	Critically endangered	An IUCN Red List designation for species at an extremely high risk of extinction.
GB RDB(EN)	Endangered	An IUCN Red List designation for species at a very high risk of extinction.
GB RDB(VU)	Vulnerable	An IUCN Red List designation for species at high risk of extinction.
HAP	Habitat action plan	A plan that identifies threats to a priority habitat and sets out targets and actions to enhance or maintain that habitat.
IUCN	International Union for Conservation of Nature and Natural Resources	A worldwide partnership and conservation network to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

Code	Full Title	Explanation
LBAP	Local biodiversity action plan	A plan that identifies threats to locally important species and habitats and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity at the county or regional level.
Notable	Scarce and threatened invertebrates	Invertebrate species which are estimated to occur within the range of 16 to 100 10km squares but subdivision into Notable A and Notable B categories is not possible as there is insufficient information available).
Notable: A	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories, but which are none-the-less uncommon in Great Britain and thought to occur in 30 or fewer 10km squares of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.
Notable: B	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories, but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties.
NN	Nationally notable	Designation for invertebrate taxa that are thought to be notably important in the UK.
NR	Nationally rare	Species in 15 or fewer hectads in Great Britain.
NS	National scarce	Species in 16-100 hectads in Great Britain.
Red	Red list	Red listed species have a population status in the UK with high conservation concern.
SAP	Species action plan	A plan that identifies threats to significantly important species and sets out targets and actions to prevent losing that species to extinction.
S41	Species of principal importance	Species of Principal Importance in England under The Natural Environment and Rural Communities (NERC) Act (2006)
UKBAP	UK biodiversity action plan	A plan that identifies threats to locally important species and habitats and sets out targets and actions in species action plans and habitat action plans to enhance or maintain biodiversity in the UK.
WCA	The Wildlife and Countryside Act 1981 (as amended)	Containing 4 Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way.
WCA1	Schedule 1 of The Wildlife and Countryside Act	This Schedule lists birds protected by special penalties at all times, but virtually all wild birds have some protection in law.

Code	Full Title	Explanation
	1981 (as amended)	Acts which are prohibited for all wild birds (except derogated 'pest' species) include intentional killing, injuring or taking; taking, damaging or destroying nests in use or being built; taking or destroying eggs; possessing or having control of (with certain exceptions but including live for dead birds, parts or derivative); setting or permitting certain traps, weapons, decoys or poisons. Selling, offering or exposing for sale, possessing or transporting for sale any live wild bird, egg or part of an egg or advertising any of these for sale, or dead wild bird including parts or derivatives are also prohibited. Many birds must be formally registered and ringed if kept in captivity. Schedule I WCA birds are additionally protected from intentional or reckless disturbance while building a nest, or when such a bird is in, on or near a nest containing eggs or young, or intentional or reckless disturbance of dependent young.
WCA5	Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	Schedule 5 animals are protected from intentional killing, injuring or taking; possessing (including parts or derivatives); intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; selling, offering or exposing for sale, possessing or transporting for the purpose of sale (alive or dead, including parts or derivatives). Protection of some species is limited to certain Sections of the Act (*e.g.* S9(1), S9(4a), S9(4b), S9(5)).
WCA8	Schedule 8 of The Wildlife and Countryside Act 1981 (as amended)	Plants and fungi protected from intentional picking, uprooting, destroying, trading (including parts or derivatives), *etc*.

APPENDIX E – GCN EDNA ANALYSIS RESULTS

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-34	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 2 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	21/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-35	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1- Arnold & Riston Drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	21/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-36	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.03 Holderness Drain North	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control†	0 of 2	Real Time PCR	21/06/2023
Degradation Control§	Evidence of degradation or residual inhibition	Real Time PCR	21/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)#	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-37	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.01 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	0 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Evidence of degradation or residual inhibition	Real Time PCR	20/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

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www.adas.uk

Sample ID: ADAS-38	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Ditch 1.02 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Evidence of degradation	Real Time PCR	20/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
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www.adas.uk

Sample ID: ADAS-39	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.04 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-40	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.05 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
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www.adas.uk

Sample ID: ADAS-42	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Pond B Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control†	2 of 2	Real Time PCR	20/06/2023
Degradation Control§	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)#	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

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www.adas.uk

Sample ID: ADAS-46	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.07 Meaux west drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
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www.adas.uk

Sample ID: ADAS-47	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.06 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Evidence of degradation	Real Time PCR	21/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

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Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-48	Condition on Receipt: Good	Volume: Passed
Client Identifier: Pond A Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

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172 Chester Road
Helsby
WA6 0AR

[redacted]

www.adas.uk

Sample ID: ADAS-553	Condition on Receipt: Good	Volume: Passed
Client Identifier: Rolth&Meaux Drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
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Helsby
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www.adas.uk

Sample ID: ADAS-554	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Ditch B Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

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Spring Lodge
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WA6 0AR

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Sample ID: ADAS-555	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Pond 2 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

APPENDIX F – PLANT SPECIES AND RELATIVE ABUNDANCE LISTS

Table 13 presents the vascular plant species recorded from arable margins at locations Arable plant survey **Target Note TN1** to **TN11** in **Figure 2**, along with subjective estimates of their relative abundance using the DAFOR scale. Species marked with asterisks are likely to have been introduced in seed mixtures sown on headlands in previous years, and those marked with two asterisks are 2024 headland crops. **Table 14** presents the vascular plant species recorded at the road-verge of Arnold Drain LWS on 16 August 2024, along with their relative abundance. Species marked with asterisks are mainly present as woody species in the hedge, and species marked with two asterisks are mainly represented in the ditch. **Table 15** presents aquatic species associated with ditches and watercourses, along with their relative abundance.

Table 13: Vascular plant species recorded from arable margins.

	Target Note										
	1	2	3	4	5	6	7	8	9	10	11
Agrostis stolonifera (Creeping Bent)	o	o	-	-	f	-	-	r	r	-	-
Alopecurus myosuroides (Black-grass)	o	o	r	o	-	a	r	o	f	o	f
Anisantha sterilis (Barren Brome)	-	-	-	r	-	-	-	o	-	-	-
Arctium lappa (Greater Burdock)	-	v	-	-	-	-	-	-	-	-	-
Arctium minus ssp. *minus* (Lesser Burdock)	-	-	-	-	-	r	-	-	-	-	r
Atriplex patula (Common Orache) [1]	-	-	-	-	-	a	-	-	r	o	f
Avena fatua (Wild-oat)	f	o	-	-	f	a	o	v	o	v	-
****Brassica napus* ssp. *oleifera* (Oil-seed Rape)	-	-	-	-	-	-	-	-	-	la	-
Bromus secalinus (Rye Brome) [2]	f	o	r	o	-	-	r	f	-	-	-
****Camelina sativa* (Gold-of-pleasure)	lf	-	-	-	-	-	-	-	-	-	-
Capsella bursa-pastoris (Shepherd's-purse)	r	-	-	-	-	f	-	-	r	o	-
Carduus nutans (Musk Thistle)	-	-	-	-	-	v	-	-	-	-	-
Chenopodium album (Fat-hen)	la	-	-	-	-	v	-	-	-	v	-
/Cichorium intybus* (Chicory)	r	-	-	-	-	-	v	-	-	a	-
Cirsium arvense (Creeping Thistle)	o	o	-	o	r	o	r	r	r	-	v
Cirsium vulgare (Spear Thistle)	-	-	-	-	-	-	-	-	v	r	r
Elymus repens (Common Couch)	-	r	r	f	f	-	f	-	f	-	-
Epilobium ciliatum (American Willowherb)	-	r	o	-	-	o	-	v	-	-	-
Epilobium hirsutum (Great Willowherb)	r	v	-	-	-	r	r	r	r	-	-

	Target Note										
	1	2	3	4	5	6	7	8	9	10	11
Epilobium obscurum (Short-fruited Willowherb)	o	v	v	-	-	o	-	-	r	-	-
Epilobium parviflorum (Hoary Willowherb)	-	v	r	-	-	-	-	-	-	-	-
Epilobium cf. × *subhirsutum* (a hybrid willowherb) [3]	-	-	-	-	-	r	-	-	-	-	-
Epilobium tetragonum (Square-stalked Willowherb)	o	-	-	-	-	v	-	-	-	-	-
Equisetum arvense (Field Horsetail)	-	-	r	-	-	-	-	f	-	-	r
Fallopia convolvulus (Black-bindweed)	o	r	-	-	-	f	-	-	-	o	-
Galium aparine (Cleavers)	r	-	-	-	-	v	-	r	-	v	v
Geranium dissectum (Cut-leaved Crane's-bill)	o	o	f	f	-	v	o	f	f	r	f
Geranium molle (Dove's-foot Crane's-bill)	v	-	v	-	-	-	-	-	-	-	-
Geranium pusillum (Small-flowered Crane's-bill)	a	r	o	-	r	r	r	-	-	-	-
Geum urbanum (Wood Avens)	-	v	-	-	-	-	-	-	-	-	-
***Helianthus annuus* (Sunflower)	r	-	-	-	-	-	-	-	-	-	-
Helminthotheca echioides (Bristly Oxtongue)	v	-	-	-	-	-	v	-	-	-	-
Heracleum sphondylium (Hogweed)	-	r	-	-	-	-	-	-	v	-	v
Jacobaea vulgaris (Common Ragwort)	-	-	v	-	-	-	-	-	-	-	-
Lactuca serriola f. *integrifolia* (Prickly Lettuce)	r	r	-	-	-	-	-	-	-	-	-
Lamium purpureum (Red Dead-nettle)	-	-	-	-	-	-	-	-	-	v	-
Lapsana communis (Nipplewort)	v	-	-	-	-	v	v	-	v	-	-
Lepidium coronopus (Swine-cress)	-	-	-	v	r	-	r	-	r	r	-
**Leucanthemum vulgare* (Oxeye Daisy)	v	-	-	-	-	-	-	-	-	-	-
***Linum usitatissimum* (Flax)	v	-	-	-	-	-	-	-	-	-	-
**Lotus corniculatus* (Common Bird's-foot-trefoil)	-	-	-	-	-	-	-	-	-	-	-
Matricaria chamomilla (Scented Mayweed)	f	-	f	r	-	f	f	r	r	r	-
Matricaria discoidea (Pineappleweed)	o	o	-	v	o	o	o	-	v	r	v
***Medicago sativa* ssp. *sativa* (Lucerne)	-	-	-	-	-	-	-	-	-	a	-
Myosotis arvensis (Field Forget-me-not)	v	-	-	-	-	-	-	-	-	-	-
Oxalis corniculata (Procumbent Yellow-sorrel)	-	v	-	-	-	-	-	-	-	-	-
Oxybasis rubra (Red Goosefoot)	v	-	-	-	-	-	-	-	-	-	-
***Panicum miliaceum* (Common Millet)	r	-	-	-	-	-	-	-	-	-	-

	Target Note										
	1	2	3	4	5	6	7	8	9	10	11
Papaver rhoeas (Common Poppy)	r	-	-	v	-	-	-	-	-	-	-
Persicaria lapathifolia (Pale Persicaria)	lf	-	-	-	-	o	-	-	-	a	-
Persicaria maculosa (Redshank)	o	r	-	-	-	f	-	-	-	v	-
***Phacelia tanacetifolia* (Phacelia)	lf	-	-	-	-	-	-	-	-	-	-
Plantago lanceolata (Ribwort Plantain)	v	v	-	-	-	-	v	-	-	-	-
Plantago major ssp. *major* (Greater Plantain)	f	o	-	r	r	o	r	v	v	-	r
Poa annua (Annual Meadow-grass)	f	o	v	r	r	v	r	-	v	r	-
Poa trivialis (Rough Meadow-grass)	f	-	-	-	o	r	-	-	a	-	-
Polygonum arenastrum (Equal-leaved Knotgrass)	f	o	-	v	o	a	o	v	-	o	-
Polygonum aviculare (Knotgrass)	-	-	-	-	-	r	-	-	-	-	-
Pulicaria dysenterica (Common Fleabane)	-	-	-	-	-	v	-	-	-	-	-
Ranunculus repens (Creeping Buttercup)	-	v	-	-	-	-	-	-	-	-	-
***Raphanus sativus* (Garden Radish)	lf	-	-	-	-	-	-	-	-	o	-
Rubus cf. *tuberculatus* (Variable-leaved Bramble)	-	v	-	-	-	-	-	-	-	-	-
Rumex crispus (Curled Dock)	-	-	-	-	-	-	-	-	-	v	-
Rumex obtusifolius (Broad-leaved Dock)	v	-	-	-	-	r	-	-	v	-	-
Senecio vulgaris (Groundsel)	f	-	-	r	-	r	v	-	r	r	r
***Setaria viridis* (Green Bristle-grass)	r	-	-	-	-	-	-	-	-	-	-
Silene noctiflora (Night-flowering Catchfly)	v	-	-	-	-	-	-	-	-	-	-
Sinapis arvensis (Charlock)	-	-	-	-	-	-	r	v	r	a	-
Sisymbrium officinale (Hedge Mustard)	-	v	-	-	-	r	-	-	-	v	-
Sonchus arvensis (Perennial Sow-thistle)	o	o	r	v	r	o	-	-	-	-	-
Sonchus asper (Prickly Sow-thistle)	f	v	-	-	-	o	r	-	r	o	r
Sonchus oleraceus (Smooth Sow-thistle)	v	-	-	-	-	-	-	-	-	-	-
Stellaria media (Common Chickweed)	-	-	-	-	-	o	-	-	-	r	-
Taraxacum species (Dandelions)	-	r	r	-	-	-	r	r	-	v	-
Thlaspi arvense (Field Penny-cress)	-	-	-	-	-	-	-	v	-	-	-
*/***Trifolium hybridum* (Alsike Clover)	r	-	-	-	-	-	-	-	-	a	-
***Trifolium resupinatum* (Reversed Clover)	-	-	-	-	-	-	-	-	-	f	-
Urtica dioica (Common Nettle)	-	v	-	-	-	-	v	-	-	-	-
Veronica arvensis (Wall Speedwell)	-	v	-	-	-	-	-	-	-	-	-
Veronica persica (Common Field-speedwell)	o	r	-	-	r	o	-	-	-	o	v
Viola arvensis (Field Pansy)	f	r	-	-	-	o	-	-	-	-	-

	Target Note										
	1	2	3	4	5	6	7	8	9	10	11
Notes											
[1] *Atriplex* with lower leaves died away appeared to be mainly *Atriplex patula* but it is possible that *Atriplex prostrata* is also present.											
[2] *Bromus secalinus* was frequent throughout the survey area, but it is possible that the commoner *Bromus hordeaceus* ssp*. hordeaceus* was overlooked, especially where all the spikelets on a plant had shattered.											
[3] A hybrid willowherb – very hairy with a four-lobed stigma (not half-way between four-lobed and club-shaped) and intermediate between *Epilobium parviflorum* and *Epilobium hirsutum* in flower size. It was assumed to be the hybrid between the two, both of which are present in the area.											

Table 14**: Vascular plant species recorded at the road-verge Arnold Drain LWS.**

Species	Relative Abundance
Achillea millefolium (Yarrow)	R
Agrimonia eupatoria (Agrimony)	R
Agrostis stolonifera (Creeping Bent)	F
Anisantha sterilis (Barren Brome)	R
Arrhenatherum elatius (False Oat-grass)	R
Brachypodium sylvaticum (False Brome)	LF
Bromus hordeaceus ssp*. hordeaceus* (Soft-brome)	VR
Carex flacca (Glaucous Sedge)	VR
Centuarea debeauxii (Chalk Knapweed)	O
Cirsium arvense (Creeping Thistle)	O
Cirsium vulgare (Spear Thistle)	VR
**Crataegus monogyna* (Hawthorn)	F
Cruciata laevipes (Crosswort)	LF
Dactylis glomerata (Cock's-foot)	O
Deschampsia cespitosa (Tufted Hair-grass)	VR
Dipsacus fullonum (Wild Teasel)	VR
Elymus repens (Common Couch)	O
***Epilobium hirsutum* (Great Willowherb)	O
Festuca rubra (Red Fescue)	F
***Filipendula ulmaria* (Meadowsweet)	LF
**Fraxinus excelsior* (Ash)	VR
***Glyceria maxima* (Reed Sweet-grass)	LA
**Hedera helix* (Ivy)	O

Heracleum sphondylium (Hogweed)	O
Hypericum hirsutum (Hairy St John's-wort)	LF
Jacobaea erucifolia (Hoary Ragwort)	LF
Jacobaea vulgaris (Common Ragwort)	VR
Lathyrus pratensis (Meadow Vetchling)	F
**Lemna* cf. *gibba* (Fat Duckweed)	LA
Lolium perenne (Perennial Rye-grass)	F
**Lonicera periclymenum* (Honeysuckle)	R
Lotus corniculatus (Common Bird's-foot-trefoil)	R
Lysimachia nummularia (Creeping-Jenny)	VR
Matricaria discoidea (Pineappleweed)	VR
**Phalaris arundinacea* (Reed Canary-grass)	LF
Phleum pratense (Timothy)	O
**Phragmites australis* (Common Reed)	O
Plantago lanceolata (Ribwort Plantain)	O
Plantago major ssp. *major* (Greater Plantain)	O
Poa annua (Annual Meadow-grass)	R
Poa trivialis (Rough Meadow-grass)	O
Polygonum arenastrum (Equal-leaved Knotgrass)	R
Potentilla reptans (Creeping Cinquefoil)	R
Prunella vulgaris (Selfheal)	R
**Prunus spinosa* (Blackthorn)	A
Ranunculus repens (Creeping Buttercup)	VR
**Rosa canina* (Dog-rose) *sensu stricto*	O
**Rosa* cf. *corymbifera* (Hairy Dog-rose) [1]	VR
**Rosa squarrosa* (Glandular Dog-rose)	R
**Rubus caesius* (Dewberry)	LF
**Rubus* cf. *tuberculatus* (Variable-leaved Bramble) [2]	A
Rumex crispus (Curled Dock)	R
Rumex sanguineus (Wood Dock)	O
**Sambucus nigra* (Elder)	R
Schedonorus arundinaceus (Tall Fescue)	F
**Sparganium erectum* (Branched Bur-reed)	LF
Taraxacum species (Dandelions)	R
Torilis japonica (Upright Hedge-parsley)	F
Trifolium pratense (Red Clover)	F
Trifolium repens (White Clover)	R
Urtica dioica (Common Nettle)	R

Vicia cracca (Tufted Vetch)	F
Notes	
[1] A dog-rose with hairs on the petiole, rachis and midrib of the leaflet. It was consistent with *Rosa corymbifera* in all characters, with the single exception of stipules having a very few teeth tipped with obscure glands perhaps suggesting hybridity (as *R. corymbifera* has entire and glandless stipules). The leaflets were too narrowly ovate for *Rosa tomentella* and the general hairiness was insufficient for that species, leaving the combination of hairs and dubious glands in a dog-rose to suggest *R. corymbifera* × *R. squarrosa* (since *Rosa canina* can't contribute either hairs or glands). It is a seldom recorded hybrid, and on balance the plant is probably best accepted as marginally atypical *Rosa corymbifera*.	
[2] A Section *Corylifolii* bramble with short inflorescences setting fruit, prickles broad at the base, leaflets densely hairy below, and glands on the primocane. It was probably *Rubus tuberculatus* but flowering was over, so the identification could not be confirmed.	

Table 15: Aquatic species associated with ditches and watercourses with relative abundance.

	Target Note (Aquatic Plants)															
Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Phragmites australis (Common Reed)	o	-	a	a	r	-	-	-	d	d	a	o	o	r	-	d
Typha latifolia (Bulrush)	-	r	a	-	-	f	-	o	r	-	-	-	r	-	-	r
Sparganium erectum (Branched Bur-reed)	-	-	-	-	-	-	d	-	-	-	-	-	r	-	a	-
Glyceria maxima (Reed Sweet-grass)	o	-	r	-	r	o	r	-	-	-	-	-	o	r	o	-
Lemna sp. (Duckweed species)	a	-	-	-	a	d	o	-	o	-	-	-	d	-	o	-
Phalaris arundinacea (Reed Canary-grass)	-	-	f	-	r	-	o	-	-	-	-	-	o	r	r	-
Callitriche sp. (a water-starwort)	-	-	-	-	r	-	-	r	-	-	-	-	a	-	r	-
Potamogeton natans (Broad-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-

	Target Note (Aquatic Plants)															
Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
leaved Pondweed)																
Stuckenia pectinata (Fennel Pondweed)	-	-	-	-	-	-	-	-	-	-	-	-	o	r	-	-
Mentha aquatica (Water Mint)	-	-	-	-	-	-	-	-	-	-	-	-	r	r	-	-
Helosciadium nodiflorum (Fool's-water-cress)	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-
Veronica beccabunga (Brooklime)	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-
Rorippa amphibia (Great Yellow-cress)	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-
Sparganium emersum (Unbranched Bur-reed)	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-
Elodea canadensis (Canadian Waterweed)	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-	-
Nasturtium officinale (Water-cress)	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-	-
Lythrum salicaria (Purple-loosestrife)	-	-	-	-	-	-	-	r	-	-	-	-	-	-	-	-
Potamogeton crispus (Curled Pondweed)	-	-	-	-	o	-	-	-	-	-	-	-	-	-	-	-
Elodea nuttallii (Nuttall's Waterweed)	-	-	-	-	o	-	-	-	-	-	-	-	-	-	-	-
Filamentous green algae	-	-	a	-	r	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G – IMPORTANT HEDGEROWS CRITERIA

Table 16 below, provides details of hedgerows assessed under The Hedgerow Regulations 1997, part 2, wildlife and landscape criteria for important hedgerow selection. Total species were recorded during field surveys, in some instances the hedgerows in this assessment have not been recorded as species rich hedgerows during the UK Hab survey (e.g. recorded as scrub due to width).

Table 16: Details of criteria assessed under The Hedgerow Regulations 1997, part 2, wildlife and landscape criteria for important hedgerow selection

Label	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10
Total species per 30m section	4	4	4	4	4	4	4	4	4	4
Recorded as species rich hedgerow under UKHab?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Public right of way adjacent?										
A bank or wall present?										
Gaps do not exceed 10%?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Standard tree within hedgerow?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Woodland species adjacent?							Y	Y	Y	
Ditch adjacent?	Y	Y	Y	Y	Y	Y		Y	Y	Y
A parallel hedge adjacent?				Y	Y					
Connections to other habitat?	Y	Y	Y	Y		Y	Y			Y
Total score (4 or more to be important)	4	4	4	5	4	4	4	4	4	4

Label	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Total species	4	4	4	4	4	4	4	3	4	3
Recorded as species rich hedgerow under UKHab?	Y	Y	Y		Y	Y	Y			
Public right of way adjacent?										
A bank or wall present?										
Gaps do not exceed 10%?	Y	Y	Y	Y	Y	Y			Y	
Standard tree within hedgerow?	Y	Y	Y	Y	Y		Y		Y	
Woodland species adjacent?						Y				
Ditch adjacent?		Y		Y	Y	Y	Y			
A parallel hedge adjacent?	Y		Y							
Connections to other habitat?	Y	Y	Y	Y	Y	Y	Y			
Total score (4 or more to be important)	4	4	4	4	4	4	3	0	2	0

Label	H21	H22	H23	H24	H25	H26	H27	H28
Total species	3	2	3	2	4	4	4	4
Recorded as species rich hedgerow under UKHab?						Y	Y	Y
Public right of way adjacent?								
A bank or wall present?								
Gaps do not exceed 10%?					Y	Y	Y	Y
Standard tree within hedgerow?								
Woodland species adjacent?								

Label	H21	H22	H23	H24	H25	H26	H27	H28
Ditch adjacent?					Y	Y	Y	Y
A parallel hedge adjacent?								
Connections to other habitat?								Y
Total score (4 or more to be important)	0	0	0	0	2	2	2	3

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