



Norfolk County Council

NORWICH WESTERN LINK ROAD

Phase 1 Habitat Survey Report





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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. The Norwich Western Link Road (NWL) is a highway scheme linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.
- 1.1.2. The NWL, hereafter referred to as the Scheme, will comprise the following listed below.
 - Dualling the A1067 Fakenham Road westwards from its existing junction with the A1270 to a new roundabout located approximately 400m to the north west.
 - Construction of a new roundabout.
 - Constructing a dual carriageway link from the new roundabout to a new junction with the A47 near Honingham.
- 1.1.3. As part of a separate planned scheme, Highways England proposes to realign and dual the A47 from the existing roundabout at Easton to join the existing dual carriageway section at North Tuddenham. If that scheme proceeds, it is expected that Highways England will construct the Honingham junction and the Norwich Western Link will connect to the north-eastern side of that junction.
- 1.1.4. The Scheme will cross the River Wensum and its floodplain by means of a viaduct. The Scheme will also cross four minor roads by means of overpass or underpass bridges. The Scheme will include ancillary works such as provision for non-motorised users, necessary realignment of the local road network and the provision of environmental mitigation measures.

1.2 ECOLOGICAL BACKGROUND

- 1.2.1. A Desk Study (WSP UK Ltd., 2018a) and Phase 1 Habitat Survey (WSP UK Ltd., 2018b) of the Scheme was commissioned in 2018 to inform route options. The initial Phase 1 Habitat Survey was undertaken in 2018 when multiple route options were being considered. The survey area considered at this time therefore covered a wider extent than that relevant to the current Scheme. This survey identified broad habitat areas and types.
- 1.2.2. The 2018 Desk Study was updated in March 2020 to include recent data relevant to the current Scheme and so the 2018 report is not referenced further.

1.3 BRIEF AND OBJECTIVES

- 1.3.1. WSP UK Ltd was commissioned by Norfolk County Council to complete a Phase 1 habitat survey, with the objective of Providing baseline biodiversity information about the Scheme and a surrounding study area with particular reference to whether legally protected and/or notable sites, botanical species or habitats are present or likely to be present.

- 1.3.2. The findings of these objectives will be used to inform the impact assessment and proposed mitigation. Details of the impact assessment and mitigation will be included within the Biodiversity Chapter of the Environmental Statement for the Scheme.

1.4 STUDY AND SURVEY AREA

- 1.4.1. An ecological Desk Study was completed in March 2020 to include recent data relevant to the Scheme. The Study Area for this was defined as;
- A 10km radius of the Scheme for Natura 2000 sites (Special Areas of Conservation (SAC), candidate SACs (cSACS), Special Protection Areas (SPA) and potential SPAs (pSPAs) of European importance and internationally designated Ramsar sites;
 - A 5km radius for statutory designated sites¹;
 - Records of legally protected and notable plant species within 2km of the Scheme; and
 - Non-statutory sites designated for nature conservation value within 1km of the Scheme.
- 1.4.2. The Survey Area comprised all areas within the Scheme boundary, including temporary areas for construction and access roads.

¹ Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

2 RELEVANT LEGISLATION

2.1 OVERVIEW

2.1.1. The Phase 1 Habitat Survey has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England (**Appendix A**). Relevant legislation and policy include:

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Natural Environment and Rural Communities (NERC) Act 2006 (England);
- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC D. , 2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
- UK Biodiversity Action Plan (UKBAP)²; and
- The National Planning Policy Framework (NPPF) 2019 (Ministry of Housing Communities & Local Government, February 2019).

² The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

3 METHODS

3.1 OVERVIEW

- 3.1.1. This appraisal has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2017), and Joint Nature Conservation Committee (JNCC, 2010) in addition to guidance contained in the British Standard - Code of Practice for Biodiversity and Development BS42020:2013 (British Standards Institute, 2013).
- 3.1.2. Details of the following are included in this section;
- Desk Study; and
 - Phase 1 Habitat Survey.

3.2 DESK STUDY

- 3.2.1. A desk study was undertaken in March 2020 and involved a review of existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within 1km, 2km, 5km and 10km of the Site, in order to capture information at an appropriate radius. This approach is consistent with current good practice guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017). The following information requested from the Norfolk Biodiversity Information Service (NBIS) was utilised in the Phase 1 habitat assessment;
- Records of legally protected and notable plant species within 2km of the Scheme; and
 - Records of non-statutory sites designated for nature conservation value within 1km of the Scheme.
- 3.2.2. Impacts on County Wildlife Sites (CWS) at distances greater than 50m from the Scheme were not considered likely and so were scoped out of further consideration. CWS beyond this distance were scoped in for further consideration based on hydrological links to the Scheme.
- 3.2.3. Freely downloadable datasets (available from Natural England) were consulted for information regarding the presence of statutory designated sites³ within 5km. This search was extended to 10km for Natura 2000 sites (Special Areas of Conservation (SAC), candidate SACs (cSACS), Special Protection Areas (SPA) and potential SPAs (pSPAs) of European importance and internationally designated Ramsar sites.
- 3.2.4. A map showing the location and extent of local statutory designated sites can be found in separate document **Appendix B**, and a map showing the location and extent of non-statutory sites can be found in separate document **Appendix C**.

³ Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

- 3.2.5. Freely downloadable datasets (available from Natural England) were consulted for information regarding Habitats of Principal Importance (HPI)⁴ within 1km and woodland listed on the Ancient Woodland Inventory⁵ (separate document **Appendix D**). HPI align to those listed under Section 41 (NERC) Act, which requires the Secretary of State to publish a list of habitats and species which are of principle importance for the conservation of biodiversity in England (**Appendix A**).

3.3 HABITAT SURVEY

- 3.3.1. A habitat survey was carried out on 11 May 2020, 11 June 2020, 9 July 2020, 15 July 2020, and 31 July 2020. The survey covered the entire area within the Scheme boundary, including boundary features, and immediate surrounds where accessible. Consideration was given to surrounding habitats using aerial photograph imagery.
- 3.3.2. The habitat survey was carried out by ecologists who have extensive experience of completing Phase 1 habitat assessments.
- 3.3.3. Habitats were described and mapped with reference to the standard Phase 1 habitat survey method (JNCC, 2010). Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species were recorded, and habitats were classified according to their vegetation types. Where appropriate, consideration was given to whether habitats qualify, or could qualify, as an HPI following habitat descriptions published by the Joint Nature Conservation Committee (JNCC, 2008). A map showing HPI habitats identified within the Scheme and within a 200m radius, extended to 1km for watercourses in separate document **Appendix D**.
- 3.3.4. Habitats were marked on a paper base map and were subsequently digitised using a Geographical Information System (GIS) (separate document **Appendix E**).
- 3.3.5. A list of plant species was compiled in **Appendix F**, with relative plant species abundance estimated using the DAFOR scale⁶. The scientific names for plant species follow those in the New Flora of the British Isles (Stace, 2019).

⁴ Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances, these are primarily based on aerial photograph analysis rather than field survey.

⁵ The ancient woodland inventory in England lists areas over two hectares in size which have been continuously wooded since at least 1600. The ancient woodland inventory in Scotland lists areas which are currently wooded and have been continuously wooded since at least 1750.

⁶ The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

3.4 NOTES AND LIMITATIONS

3.4.1. Every effort has been made to provide a comprehensive description of the Scheme, however, the following specific limitations apply to this assessment:

- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage;
- Natural England's Priority Habitat Inventory (PHI) dataset obtained to inform the assessment outside of the Scheme boundary is frequently derived from aerial imagery only without ground truthing with a confidence of correct habitat classification given as low. Therefore, any assessment of habitats beyond the Scheme boundary is limited in its accuracy;
- Arable and horticulture: Arable field margins is listed as an HPI and are likely to be present within the Scheme. However, the locations and extent of this HPI will only be identified following the National Vegetation Classification (NVC) survey;
- The field survey was carried out over the period of five days in May June and July focussing on different sections of the Scheme each visit, as such only a selection of all plant species that occur within the Scheme and identifiable in that season will have been recorded. However, for the purpose of a Phase 1 habitat assessment it is considered an accurate assessment of habitat types and potential of the Scheme to support important or notable plant communities;
- The Phase 1 habitat map (separate document **Appendix E**) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a Phase 1 habitat assessment, the maps are not intended to provide exact locations of key habitats; and
- Hedgerows are shown on the Phase 1 map however they are reported separately within the updated hedgerow report (WSP UK Ltd., 2021).

4 RESULTS

4.1 DESIGNATED SITES

INTERNATIONALLY DESIGNATED SITES

4.1.1. The following internationally designated sites are within 10km of the Scheme (**Table 4-1**).

Table 4-1 - Internationally Designated Sites within 10km of the Scheme

Site and designation	Approximate distance and direction from Scheme	Description
River Wensum SAC	Within the Scheme	The Wensum represents sub-type 1 in lowland eastern England. Although the river is extensively regulated by weirs, <i>Ranunculus</i> vegetation occurs sporadically throughout much of the river's length. Stream water-crowfoot <i>R. penicillatus</i> ssp. <i>pseudofluitans</i> is the dominant <i>Ranunculus</i> species but thread-leaved water-crowfoot <i>R. trichophyllus</i> and fan-leaved water-crowfoot <i>R. circinatus</i> also occur. White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> is the Annex II species present that is the primary reason for site selection. Annex II species present as a qualifying feature, but not a primary reason for site selection include Desmoulin's whorl snail <i>Vertigo moulinsiana</i> , and Brook lamprey <i>Lampetra planeri</i> , Bullhead <i>Cottus gobio</i>

NATIONALLY DESIGNATED SITES

4.1.2. The following nationally designated sites are within 5km of the Scheme (**Table 4-2**).

Table 4-2 - Nationally Designated Sites within 5km of the Scheme

Site and designation	Approximate distance and direction from Scheme	Description
River Wensum SSSI	Within the Scheme	<p>The Wensum has been selected as one of a national series of rivers of special interest as an example of an enriched, calcareous lowland river. With a total of over 100 species of plants, a rich invertebrate fauna and a relatively natural corridor, it is probably the best whole river of its type in nature conservation terms, although short stretches of other similar rivers may show a slightly greater diversity of species. The River itself supports an abundant and diverse invertebrate fauna including the native freshwater crayfish <i>Austropotamobius pallipes</i> as well as a good mixed fishery. Brown trout <i>Salmo trutta fario</i> form the major component of the fish community of the upper Wensum, whilst the middle and lower reaches are dominated by chub <i>Leuciscus cephalus</i>, pike <i>Esox lucius</i>, eel <i>Anguilla anguilla</i> and barbel <i>Barbus barbus</i>. Kingfisher <i>Alcedo atthis</i> and little grebe <i>Tachybaptus ruficollis</i> breed along the River, whilst the adjacent wetlands have good populations of reed warblers <i>Acrocephalus scirpaceus</i>, sedge warblers <i>Acrocephalus schoenobaenus</i> and barn owls <i>Tyto alba</i>.</p>

LOCAL NON-STATUTORY DESIGNATED SITES

- 4.1.3. Information provided on non-statutory designated sites within 1km of the Scheme boundary was provided in the data search. Impacts on County Wildlife Sites (CWS) at distances greater than 50m from the Scheme boundary are not considered likely and so have been scoped out of further consideration. Information on CWS within 50m or those outside of this distance that are hydrologically linked to the Scheme are however given in **Table 4-3**.

Table 4-3 - Local Non-Statutory Designated Sites within 50m of the Scheme

Site and designation	Approximate distance and direction from Scheme	Description
River Wensum Pastures, Ringland Estates CWS (Ref: 2303)	Within the Scheme	This site comprises winter-flooded, predominantly semi-improved, cattle-grazed pasture, dissected by spring-fed ditches, with several pockets of wet woodland. A prominent feature of the marshland is the presence of numerous areas of low-lying ground, including some ephemeral ponds, which may correspond to former meanders of the River Wensum.
Broom & Spring Hills CWS (Ref: 1341)	Within the Scheme	An area of semi-natural deciduous woodland which is fairly acidic in character and dominated by oak <i>Quercus robur</i> and sycamore <i>Acer pseudoplatanus</i> . The ground flora is poor over much of the wood and only moderately species-rich in parts. The southern part of the wood consists of conifer and deciduous plantation. There is an active pheasant pen in the wood. The majority of the northern area of the site is oak/ash <i>Fraxinus excelsior</i> dominated woodland with a dense sycamore understorey.
Wensum Pastures at Morton Hall CWS (Ref: 2070)	Within the Scheme	A moderately large, open area of predominately improved cattle-grazed pasture adjacent to the River Wensum SSSI, crossed by a network of drains supporting a species-rich flora associated with aquatic habitats.
Land adjoining Foxburrow Plantation CWS (Ref: 2116)	Within the Scheme	This site forms part of a larger area known collectively as Foxburrow Plantation and The Waterfence. It consists of an extensive area of wet, species-rich grassland situated in the bottom of a spring-fed valley.
Fakenham Road, Roadside Nature Reserve (RNR) (Ref: 59)	Within the Scheme.	This RNR lies on the north side of a busy 'A' road and extends to 185m. The verge is level and 5m wide and backed by a steep 3m wide bank rising to a fence with arable farmland beyond. Designated for the presence of hoary mullein <i>Verbascum pulverulentum</i> .
Primrose Grove CWS (Ref: 2305)	Within the Scheme.	This is an area of woodland with some compartments thought to be of ancient origin and wider areas of mature secondary woodland. The CWS here forms only part of a

Site and designation	Approximate distance and direction from Scheme	Description
		much larger area of woodland, marked on most maps as Primrose Grove and Long Plantation, with further areas of woodland adjacent to the north-east, marked on maps as The Nursery and Rose Carr.
Old Covert, Wood Lane CWS (Ref 2109)	10m west	A coppice with standards woodland that is not listed on the Ancient Woodland Inventory, although it may have once been part of a larger, ancient woodland. The wood is managed as active coppice and for shooting. The standards are mostly sweet chestnut <i>Castanea sativa</i> , with frequent sycamore. Oak and ash are occasional, but more abundant in the north of the woodland.
Gravelpit Plantation and Church Hill CWS (Ref: 2304)	10m east	Gravelpit Plantation comprises closed-canopy broadleaved semi-natural and mixed plantation woodland, on largely dry, free-draining substrates, although some areas exhibit indications of impeded drainage. Church Hill, to the south, is largely open, acidic grassland. Soils appear slightly acid to acid throughout.
Mouse Wood CWS (Ref: 2050)	15m west	An ancient, replanted woodland which is now predominantly a commercially-managed conifer plantation surrounded mainly by arable farmland. Privately owned. A public footpath runs along the northern boundary, leading into a narrow-hedged lane.
Attlebridge Hills CWS (Ref: 1343)	20m north	This site is a varied structure, broad-leaved semi-natural woodland. The canopy is dominated by mature oak, sycamore, sweet chestnut with extensive areas of mixed coppice of hazel <i>Corylus avellana</i> , sycamore and sweet chestnut.
River Tudd at Easton and Honingham CWS (Ref: 250)	670m south-east	This site comprises a 4.6km length of the River Tudd, consisting of species-rich aquatic, marginal and emergent riverine flora. Otter and water vole have been recorded within the River. Aquatic species include lesser water parsnip <i>Berula erecta</i> and unbranched bur-reed <i>Sparganium emersum</i> , with notable emergent

Site and designation	Approximate distance and direction from Scheme	Description
		species including Butterbur <i>Petasites hybridus</i> and large bittercress <i>Cardamine amara</i> .
Church Meadow, Alder Carr, Three Corner Thicket and Nursery Plantation	810m south	This site comprises mainly cattle grazed, unimproved wet pastured, bisected by spring-fed ditches, with areas of wet and dry woodland. Notable species included ragged robin <i>Silene flos-cuculi</i> , clustered dock <i>Rumex conglomeratus</i> , greater birds-foot trefoil <i>Lotus pedunculatus</i> , water plantain <i>Alisma plantago-aquatica</i> , pignut <i>Conopodium majus</i> , 3-nerved sandwort <i>Moerhingia trinerva</i> .
Ringland Pits	1.82km	This site is a flooded disused gravel workings adjacent to the River Wensum and which is now mostly oak and birch woodland with some damp grassland and a small amount of acid grassland. The southern half of the site has a wide area of alder carr, with grey willow <i>Salix cinerea</i> , ash and some holly <i>Ilex aquifolium</i> . A small area of acid grassland occurs on the raised gravel paths and a small area behind one of the lakes with a steep sandy bank; species here include, sheep's sorrel <i>Rumex acetosella</i> , broom <i>Cytisus scoparius ssp scoparius</i> , gorse <i>Ulex europaeus</i> , bird's-foot <i>Ornithopus perpusillus</i> and common centaury <i>Centaureum erythraea</i> .
Taverham Mill	1.83km	This site is situated to the south of the River Wensum and consists of a fishing lake surrounded by marshy and neutral grassland and a mixture of planted and semi-natural woodland over an acid soil. The lake supports a good aquatic vegetation with abundant fringed water-lily <i>Nymphoides peltata</i> which is scarce in Norfolk, white water-lily <i>Nymphaea alba</i> and rigid hornwort <i>Ceratophyllum demersum</i> .

4.2 DESK STUDY

- 4.2.1. The data search returned 112 flowering plant species records (87 species), six plant species with some conservation status were included, broad location references were provided:

Table 4-4 - Records of flowering plants within desk study

Number of records	Species	Designation	Year	Location
one	creeping spearwort <i>Ranunculus reptans</i>	Nationally Rare (NR), Red data List for Great Britain (RLGB) Vulnerable (VU)	2010	Fakenham Road
one	mossy stonecrop <i>Sedum acre</i>	Norfolk Rare Plant Inventory (NRPI), Nationally Scarce (NS)	2010	Ringland
one	hoary mullein	NRPI, NS	2010	Fakenham road
one	hoary cinquefoil <i>Potentilla argentea</i>	NRPI, Near Threatened (NT)	2010	Ringland
one	common cudweed <i>Filago vulgaris</i>	NRPI, RLGB-Lower risk (Lr) NT	2010	Ringland
one	small cudweed <i>Filago minima</i>	RLGB.Lr NT	2010	Fakenham Road

4.2.2. Ninety five moss records (63 species) and 16 liverwort records (12 species) were included in the data search, which all originated from a survey completed on the Dinosaur Park near Lenwade, 800m west of the Scheme between 2012 and 2013. None of the moss or liverwort species returned by the data search had any conservation status within England.

ANCIENT WOODLAND

4.2.3. An Ancient Woodland Inventory site within 200m of the Scheme forms part of Primrose Grove CWS. In addition, Mouse Wood CWS is also listed as an Ancient Woodland Inventory site. The Scheme is over 30m from Primrose Grove ancient woodland (south) and Mouse Wood ancient woodland (west) is located adjacent to the pre-existing Wood Lane.

PRIORITY HABITAT INVENTORY (PHI)

4.2.4. Natural England's PHI database was accessed to map all PHI within a radius of 200m beyond the Scheme boundary, this was extended to 1km for connected watercourses. PHI habitats returned included:

- Woodland: Lowland mixed deciduous woodland
- Wetland: Lowland fens
- Wetland: Coastal and floodplain grazing marsh
- Freshwater: Rivers

4.3 HABITAT OVERVIEW

- 4.3.1. The Scheme comprised a 148.8ha area, featuring a range of habitats including the River Wensum and Wensum valley with its associated floodplain grazing marsh, streams and ditches within the north of the Scheme. Continuing south from the floodplain the Scheme incorporates sections of a series of woodlands namely, Rose Carr, the Nursery plantation, Broom and Spring Hills, and Long plantation, which have been referred to collectively as the ‘northern woodlands’, relating to their northerly position within the Scheme. Beyond the northern woodlands in a southerly direction the Scheme becomes predominantly an intensive arable landscape occasionally intersected by hedgerows, with a segment of an unnamed woodland also included to the south of Ringland lane. As the Scheme progresses in a southerly direction the Broadway woodland is reached with the Foxburrow plantation woodland following this, the Foxburrow stream and associated wet grassland area bordered the southern edge of the woodland. Intensive arable land compartmented by hedgerows formed the remaining area of the Scheme to its conclusion.
- 4.3.2. The Scheme encapsulated an area that was typical of its surroundings, with the River Wensum Valley to the east and west and an agricultural landscape with occasional fragments of woodland and grassland punctuating intensive arable fields.

RIVER WENSUM VALLEY

- 4.3.3. The north of the Scheme encountered a section of the River Wensum flowing east to west, with features typical of the Wensum Valley surrounding. The river itself was bordered immediately with regularly grazed pastoral land to the north and improved grassland hay / silage field to its south. An area of floodplain grazing marsh was present to the south beyond the improved grassland, comprising wet grassland and rushes which was grazed regularly and seasonally inundated. Two scrub dominated ditches ran through this grazing marsh with a stream bounding the south.

NORTHERN WOODLANDS

Rose Carr

- 4.3.4. The structure of this woodland comprised a contiguous boundary of mature trees, which framed more recent plantation within the south, moving north mature trees became more frequent within the woodland. The north of the woodland was influenced by the hydrology of the floodplain displaying more typical elements of a wet carr woodland with a pond present here.

The Nursery

- 4.3.5. The Nursery woodland comprised a semi-mature mixed plantation which connected Rose Carr to the north and Primrose Grove woodland to the south.

Primrose Grove CWS

- 4.3.6. A small section of this woodland is included within the Scheme at the southern end of the Nursery, comprising predominantly semi-mature conifer plantation with occasional deciduous species. The main area of Primrose Grove CWS extends outside the Scheme to the south.

Broom and Spring Hills

- 4.3.7. This woodland comprises an area of broadleaved woodland with a mixture of mature and semi-mature trees forming a dense canopy shading the ground layer. A section of mixed plantation woodland adjoined to the south. Only the south-eastern tip of this woodland was present within the Scheme.

Long Plantation

- 4.3.8. Long plantation is the largest of the northern woodland, extending north from Primrose Grove in the south, it comprised an area of mixed plantation woodland on a south facing slope, on sandy soil. Mature broadleaved trees were found on the periphery, although they did not form a continuous boundary as with Rose Carr. A cleared and maintained track runs east-west through the woodland to permit access for maintenance.

UNNAMED WOODLAND

- 4.3.9. The northern tip of a deciduous woodland south of Ringland Lane was included within the Scheme, with mature trees bounding the woodland. The trees that comprised the majority of this section of woodland were semi-mature with occasional mature trees throughout. There was also evidence of some tree planting within the woodland.

THE BROADWAY

- 4.3.10. The Broadway woodland within the south of the Scheme comprised a linear strip of mixed woodland running east to west with a road running through its length. The majority of the woodland consisted of broadleaved species with some mature trees with occasional semi-mature coniferous species.

FOXBURROW PLANTATION AND FOXBURROW STREAM

Foxburrow Plantation

- 4.3.11. Foxburrow plantation woodland within the south of the Scheme, it comprised a mixed plantation woodland of mainly semi-mature trees. Maintained glades present within the woodland function as access tracks and rides for pheasant shooting. The woodland was used to rear pheasants with feeders present throughout. The woodland sloped gently towards the Foxburrow stream to the south.

Foxburrow Stream

- 4.3.12. The Foxburrow Stream is a tributary of the River Tudd which ran east to west through an area of wet / marshy grassland to the south of Foxburrow Plantation. A shallow stream which ran through a heavily vegetated and occasionally cattle poached channel.

4.4 HABITATS OF PRINCIPAL IMPORTANCE (HPI)

4.4.1. Habitats within the Scheme boundary were assessed against the definitions of HPI (JNCC, 2008), habitats which matched these definitions are presented below in **Table 4-5**.

Table 4-5 - HPI areas within the Scheme

HPI	Area (ha)	Length (m)
Woodland: Lowland mixed deciduous woodland	2.61	N/A
Woodland: Wet woodland	0.47	N/A
Wetland: Coastal and floodplain grazing marsh	3.42	N/A
Freshwater: River	N/A	631
Hedgerow	N/A	4491

WOODLAND: LOWLAND MIXED DECIDUOUS WOODLAND

4.4.2. This HPI was predominantly associated with the southern section of Rose Carr, with a section of Broom and Spring Hills, the unnamed woodland and two small blocks of deciduous woodland within the south of the Scheme also included, totalling a 2.61ha area.

WOODLAND: WET WOODLAND

4.4.3. This HPI was recorded exclusively as the 0.47ha northern area of Rose Carr woodland, which sloped down towards the floodplain, qualifying as it exhibits features and species composition of wet and seasonally inundated woodland habitats.

WETLAND: COASTAL AND FLOODPLAIN GRAZING MARSH

4.4.4. A 3.4ha area within the north of the Scheme matched the definition of this HPI, comprising a floodplain grazing marsh area south of the River Wensum.

FRESHWATER: RIVER

4.4.5. This HPI was identified within the Scheme comprising sections of the River Wensum, a stream at the southern boundary of the floodplain, and Foxburrow stream in the south of the Scheme. In total 631m in length of this HPI was present within the Scheme boundary.

HEDGEROW

4.4.6. Hedgerows which met the definitions of this HPI were present throughout the Scheme, totalling approximately 4,491m in length (WSP UK Ltd., 2018c).

4.5 PHASE 1 HABITAT CLASSIFICATIONS

- 4.5.1. A breakdown of the habitat types identified, their areas and percentage of total Scheme area for each habitat type can be found in **Table 4-6**.
- 4.5.2. A selection of habitat photographs are provided in **Appendix G**.

Table 4-6 - Phase 1 Habitat Areas

Habitat	Habitat code	Area (ha)	Percentage of total Site area
Broadleaved semi-natural woodland	A1.1.1	3.39	2.3
Broadleaved plantation woodland	A1.1.2	0.63	0.4
Coniferous plantation woodland	A1.2.2	0.58	0.4
Mixed semi-natural woodland	A1.3.1	2.29	1.5
Mixed plantation woodland	A1.3.2	6.37	4.3
Dense scrub	A2.1	0.32	0.2
Scattered scrub	A2.2	0.46	0.3
Scattered trees - broadleaved	A3.1	NA	NA
Semi-improved neutral grassland	B2.2	2.12	1.4
Improved grassland	B4	2.21	1.5
Marshy grassland	B5	0.54	0.4
Poor semi-improved neutral grassland	B6	16.3	10.9
Continuous bracken	C1.1	N/A	N/A
Floodplain grazing marsh	E3.3	3.42	2.3
Running water – river / stream	G2.1	NA	NA
Arable – intensive	J1.1	99.91	67.2
Amenity grassland	J1.2	1.38	0.9
Tall ruderal	J1.3	0.81	0.5
Introduced shrubs	J1.4	0.04	<0.1
Ditch	J2.6	N/A	N/A
Building	J3.6	0.13	0.1
Bare ground	J4	3.32	2.2
Hard standing	J5	4.57	3.1
Total		148.8	100

BROADLEAVED SEMI-NATURAL WOODLAND - A.1.1.1

- 4.5.3. This habitat type comprised 3.39ha and was identified within the north of the Scheme, the main section being the Rose Carr woodland, others included a smaller area present south of Ringland lane which forms the north western tip of an unnamed section of woodland, a section of woodland at the southern tip of Broom and Spring Hills woodland, and additionally two small woodland blocks within arable land in the south of the Scheme.

Rose Carr

- 4.5.4. The structure of Rose Carr is a predominantly dense and contiguous canopy cover shading the majority of the understory and ground layer. The composition of the woodland featured large mature oak *Quercus robur* and beech *Fagus sylvatica* trees, with semi-mature sycamore *Acer pseudoplatanus* and ash *Fraxinus excelsior*. A pond is present within the northern area of this woodland and is dominated by reed *Phragmites australis* with occasional goat willow *Salix caprea* and alder *Alnus glutinosa*, the northern section generally wetter and displaying characteristics of alder carr woodland (**Figure G-4**). Along the northern eastern boundary several semi-mature / mature hybrid black poplar trees *Populus x canadensis* were noted.
- 4.5.5. The ground flora of Rose Carr is dominated by nettle *Urtica dioica* within some eastern sections of the woodland, more centrally the ground flora is sparse with bare ground frequent. Occasional patches of dog's mercury *Mercurialis perennis*, ivy *Hedera helix*, and ground ivy *Glechoma hederacea* were present.
- 4.5.6. A good population of moschatel *Adoxa moschatellina*, was recorded on surveys undertaken of Rose Carr earlier in the year in May when this species is in flower.

Unnamed woodland

- 4.5.7. The section of unnamed woodland that was surveyed comprised of predominantly oak, with smaller quantities of other species i.e. beech, hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, elder *Sambucus nigra*, sycamore, and spindle *Euonymus europaeus* which was present on the western edge of the woodland. The oak trees on the outer perimeter of the woodland were mostly mature, with some densely ivy clad.
- 4.5.8. Within the woodland the canopy is mostly dense although some sections are more open. The ground flora is species poor and dominated by bramble *Rubus fruticosus agg.* within most of the woodland section. The central and southern section's comprise larger areas of bare ground, sparsely vegetated with nettle, ivy, and bramble.

Broom and Spring Hills

- 4.5.9. The main component of the canopy comprised mature beech trees with occasional mature oak trees, other semi-mature species present included field maple, hawthorn, elder, elm *Ulmus minor*, and cherry. The ground layer was sparse, with some patches of nettle and bramble occasionally noted, other species included dog's mercury, ground ivy, and red campion.

Other woodland

- 4.5.10. Within the southern extent of the Scheme two small woodland blocks were present at the edge of arable land. The woodland blocks were both surrounded depressions that were dry at the time of survey. They comprised mainly of semi-mature trees with occasional mature specimens, species included oak, hawthorn, hazel, blackthorn, goat willow *Salix caprea*, and ash.

BROADLEAVED PLANTATION WOODLAND – A1.1.2

- 4.5.11. Within the southern extent of Rose Carr, a 0.63ha area of woodland was identified as broadleaved plantation woodland, as it was dominated by rows of planted semi-mature sycamore trees, with species poor ground flora comprising patches of bramble and nettle, with bare ground frequent.

Coniferous plantation woodland – A1.2.2

- 4.5.12. A small 0.56ha area within the northern extent of the Scheme was categorised as coniferous plantation woodland, this comprised of a number of recently planted young spruce *Picea sp.* trees within an area of poor semi-improved grassland.

Mixed semi-natural woodland – A1.3.1

- 4.5.13. A 2.29ha area of woodland within the Scheme was categorised as mixed semi-natural woodland. This habitat type was only recorded within the Broadway woodlands, within the southern section of the Scheme (**Figure G-7**). The canopy of the woodland featured predominantly broadleaved species, including beech, sycamore, oak, ash, young field maple, holly *Ilex aquifolium*, young cherry *Prunus avium*, hawthorn *Crataegus monogyna*, and elder. Mature oak and beech trees were present occasionally. Deciduous trees comprising pine *Pinus spp.* were present occasionally throughout the canopy and were mostly semi-mature.
- 4.5.14. The ground layer was species poor, with ash saplings dominant in some places. Other sections of the ground layer consisted of nettle, bramble, garlic mustard *Alliaria petiolata*, herb Robert *Geranium robertianum*, ivy, cleavers *Galium aparine*, cow parsley *Anthriscus sylvestris*, some dog's mercury patches, ground ivy and red campion *Silene dioica*.

Mixed plantation woodland – A1.3.2

- 4.5.15. A 6.64ha area of woodland within the Scheme was considered to comprise mixed plantation woodland. This categorisation of woodland was the most abundant woodland habitat type recorded and included an area of Broom and Spring Hills, Long Plantation, Foxburrow Plantation, and the Nursery.

Broom and Spring Hills

- 4.5.16. A small section of the Broom and Spring Hills woodland contained within the Scheme was categorized as mixed plantation woodland with pine *Pinus spp.* becoming frequent towards the north of the woodland. The ground layer was sparse with nettle dominant in places with some patches of dog's mercury also present. Broadleaved trees present included sycamore, field maple, beech and elm.

Long Plantation

- 4.5.17. The Long Plantation woodland was categorised as mixed plantation woodland; some oak trees on the periphery of the woodland were mature and of considerable size, especially at the western extent of the woodland (**Figure G-10**). Large sections of this woodland are dominated by semi-mature / mature pine *Pinus spp.* plantation, deciduous species included oak, beech, field maple, elder, ash and hawthorn. The ground layer is dominated by bramble and bracken in large areas, with other areas bare or more sparsely vegetated with species including nettle, false brome *Brachypodium sylvaticum*, ground ivy, cow parsley, false oat-grass *Arrhenatherum elatius*, ivy, red campion *Silene dioica*, and dog's mercury.

Foxburrow Plantation

- 4.5.18. Foxburrow Plantation is located within the southern section of the Scheme, the woodland canopy is dominated predominantly by broadleaved species consisting of sycamore, hornbeam, field maple, elder, oak, hazel, ash, goat willow, silver birch and rarely cherry laurel *Prunus laurocerasus*, with coniferous species occasionally present throughout (**Figure G-6**).
- 4.5.19. Glades are managed throughout the woodland, with thin glades 2-3m wide running east-west and a wide 15-20m glade north-south. The glades are dominated by grass species such as red fescue *Festuca rubra*, annual meadow grass *Poa annua*, and perennial rye grass *Lolium perenne*, with forbs including broad leaved dock *Rumex obtusifolius*, common flax *Linum usitatissimum*, creeping buttercup *Ranunculus repens*, common field-speedwell *Veronica persica*, and mouse-ear chickweed *Cerastium fontanum*. The ground layer within the woodland is sparse in some sections of woodland with bare ground dominant, other sections of the woodland particularly the northern blocks are dominated by bramble, nettle and bracken *Pteridium aquilinum*, other species present within the ground layer included comfrey *Symphytum officinale*, foxglove *Digitalis purpurea*, white foxglove *Digitalis purpurea f. albiflora* also present, broom *Cytisus scoparius*, and common bluebell *Hyacinthoides non-scripta*. Bluebells were locally abundant in a small eastern section of woodland.

The Nursery

4.5.20. This area of mixed plantation is connected to Rose Carr to the north and Primrose Grove (outside of the Scheme boundary) to the south. The composition of this woodland consists predominantly of semi-mature pine plantation, with semi-mature sycamore and an understory that is mostly dominated by self-seeded young sycamore trees, with patches of bramble and nettle also present. On the western edge of the woodland a track maintained for access runs north-south between Rose Carr and Primrose Grove through the Nursery, this track is lined on the western perimeter of the wood by sycamore, oak, holly, and field maple.

Dense scrub – A2.1

4.5.21. This habitat type was present occasionally within the Scheme totalling 0.52ha, and was present along road verges, field margins, and in small patches adjacent to woodland. Bramble was the most frequently occurring species in this habitat type, with other commonly recorded species including bracken, blackthorn, nettle, goat willow and cleavers.

Scattered scrub – A2.2

4.5.22. This habitat type was predominately present within a rectangular area just south of the floodplain which comprised predominantly scattered bramble, with tall false oat grass, creeping thistle *Cirsium arvense*, and nettle, with occasional hawthorn and elder. A patch of gorse *Ulex europaeus* dominated scrub with goat willow and bramble is also present to the south of Foxburrow Plantation.

SCATTERED TREES – BROADLEAVED – A3.1

4.5.23. A number of semi-mature and mature scattered trees were present occasionally across the Scheme, usually in conjunction with hedges, roadsides, field margins, and mature willow *Salix spp.* trees bordering the Wensum. The most frequent species of tree identified in this habitat type was oak, with accompanying species including ash, hawthorn, field maple, sycamore, horse chestnut, and holly.

Semi-improved neutral grassland – B2.2

4.5.24. Semi-improved neutral grassland comprised 2.12ha of the Scheme. This habitat type was recorded in areas surrounding Fakenham road within the north of the Site, to the east of Rose Carr, along the southern edge of a field margin north of Weston road, and south of the Foxburrow plantation. These grassland areas were all classified under this habitat type, they are described separately where they are considered to differ significantly in their species composition, origin and structure.

Fakenham Road

- 4.5.25. The semi-improved grassland habitat at the side of Fakenham road at the roundabout towards the north east of the Scheme is indicative of a sown grassland, on banks of recently disturbed ground that may have been translocated. The species composition was high in forbs in relation to grass species suggestive of the use of a seed mix favouring wildflowers. The percentage of bare ground was relatively high at around 30%. The most abundant grass species recorded was red fescue, with other grass species in very low abundance including annual meadow grass and barren brome *Bromus sterilis*. Forbs present included frequent common knapweed *Centaurea nigra*, oxeye daisy *Leucanthemum vulgare*, birds-foot trefoil *Lotus corniculatus*, and yarrow *Achillea millefolium*, alongside red campion *Silene dioica*, hairy tare *Vicia hirsuta*, salad burnet *Sanguisorba minor*, sainfoin *Onobrychis vicifolia*, field pansy *Viola arvensis*, and spear thistle *Cirsium vulgare*.

East of Rose Carr and north of Weston Road

- 4.5.26. A section of a semi-improved neutral grassland east of Rose Carr (**Figure G-2**) and south of the floodplain and to the north of Weston Road (**Figure G-12**) is included within the Scheme. Both border arable fields and are mown infrequently to be managed as a buffer strip. It is likely that these areas were sown to act as a wildflower border, abundant species included bird's-foot trefoil, oxeye daisy, red fescue, common knapweed, mugwort *Artemisia vulgaris*, ribwort plantain *Plantago lanceolata*, and false-oat grass, with accompanying species such as tufted vetch *Vicia cracca*, bristly ox-tongue *Helminthotheca echioides*, sainfoin, white clover *Trifolium repens*, yarrow *Achillea millefolium*, and curled dock *Rumex crispus*.

South of Foxburrow Plantation

- 4.5.27. This area of semi-improved grassland is located to the north of the stream within the south of the Scheme adjacent to the Foxburrow plantation. It is distinct from the other areas of this habitat type described as it is a wet meadow, with species indicative of a grassland with hydrological influences. The sward is of moderate height occasionally cattle grazed but not intensively.
- 4.5.28. Grass species abundant within this grassland included sweet vernal grass *Anthoxanthum odoratum*, meadow foxtail *Alopecurus pratensis*, Yorkshire fog *Holcus lanatus*, and red fescue. Accompanying forb species were typical of damp meadows and included bugle *Ajuga reptans*, bog stitchwort *Stellaria alsine*, brooklime *Veronica beccabunga*, thyme-leaved speedwell *Veronica serpyllifolia*, yellow vetchling *Lathyrus pratensis*, and water mint *Mentha aquatica*.

IMPROVED GRASSLAND – B4

- 4.5.29. A 2.21ha area of the Scheme was described as agriculturally improved grassland. This habitat type is defined as containing over 50% perennial rye-grass or other agricultural species (JNCC, 2010).

4.5.30. This habitat type was identified within a field bordering the south of the River Wensum within the north of the Scheme. This field contained 80% - 90% perennial rye-grass, grown as an agricultural crop for hay / silage. Forbs were in low abundance and diversity, almost exclusively occurring at the peripheries of the field, these species included white dead-nettle *Lamium album*, nettle, creeping buttercup *Ranunculus repens*, with reed sweet grass *Glyceria maxima* frequent near the boundary of the Wensum to the north and ditch to the south of this area.

MARSHY GRASSLAND – B5

4.5.31. A 0.54ha area within the south of the Scheme adjacent to a stream was categorised as marshy grassland, with over 25% cover of *Juncus* species (**Figure G-9**). Soft rush *Juncus effusus* was the most abundant species in the sward, accompanying grass species included, red fescue, sweet vernal grass, false oat grass, and tufted hair grass *Deschampsia cespitosa*. Forbs present included marsh thistle *Cirsium palustre*, marsh foxtail *Equisetum palustre*, creeping buttercup, cleavers *Galium aparine*, fool's watercress *Apium nodiflorum*, and cuckoo flower *Cardamine pratensis*.

4.5.32. Areas of scrub encroachment were noted within the marshy grassland area, bramble patches, goat willow and gorse scrub were establishing especially on the boundaries of the grassland area.

4.5.33. Standard trees were occasionally present within the marshy grassland habitat area, with species including alder *Alnus glutinosa*, oak, goat willow, and cherry.

POOR SEMI-IMPROVED NEUTRAL GRASSLAND – B6

4.5.34. This habitat type is present frequently across the Scheme, comprising a 16.3ha area in total. Areas on Site where this habitat was recorded between arable fields, alongside hedges, and at woodland edges (**Figure G-3**). These areas were species-poor consisting predominantly of grass species including perennial rye-grass, cock's-foot, false oat-grass and Yorkshire fog. Forbs were generally present in low abundance and diversity in this habitat type, commonly recorded species included creeping thistle, creeping buttercup, field bindweed *Convolvulus arvensis*, broad leaved dock, nettle, ribwort plantain, white dead nettle, ragwort *Senecio jacobaea*, common vetch *Vicia sativa*, mugwort, hogweed *Heracleum sphondylium*, bramble, red campion, teasel *Dipsacus fullonum*, and bristly ox-tongue.

CONTINUOUS BRACKEN – C1.1

4.5.35. Linear habitat running along the southern verge of Ringland lane was dominated by bracken with bramble also frequent, other species recorded within this habitat type included hogweed and cleavers (**Figure G-11**).

FLOODPLAIN GRAZING MARSH – E3.3

- 4.5.36. A 3.33ha area of floodplain grazing marsh interspersed by a network of ditches was identified 150m south of the River Wensum beyond the improved grassland area (**Figure G-1**). This area was categorised under this habitat type classification, however separate vegetation communities and hydrological relationships were noted within.
- 4.5.37. An area of wet grassland which contained the greatest diversity (relatively) of typical wetland flora, i.e. marsh foxtail *Alopecurus geniculatus*, water chickweed *Myosoton aquaticum*, marsh bedstraw *Galium palustre*, cuckooflower, brooklime, water forget-me-not *Myosotis scorpioides*. was present towards the southern extent of this floodplain section. This section is likely subject to seasonal inundation and was wetter than other parts of the floodplain.
- 4.5.38. The drier areas located more centrally within this floodplain were largely depauperate of such species with populations of creeping buttercup, curled dock, white clover, daisy *Bellis perennis* etc. becoming more regular indicating a grassland that is moving towards improvement. The impacts of cattle grazing were evident within this area, the sward being tightly grazed amongst occasional tussocks of rushes.
- 4.5.39. The area to the west is comparatively species-poor with tufted hair grass and rarely soft rush with smaller areas of species poor grazed grassland throughout. Scrub and dense reed present within the drier ditches.
- 4.5.40. Tall vegetation was present parallel to the ditches / stream, comprising mainly of reed canary grass *Phalaris arundinacea* and reed sweet-grass *Glyceria maxima* with nettle frequent.

RUNNING WATER – RIVER / STREAM – G2.1

- 4.5.41. Three flowing watercourses were identified within the Scheme, one being the River Wensum, the others comprised a stream running along the southern extent of the floodplain, and Foxburrow stream to the south of Foxburrow plantation. It important to recognise the interconnected nature of the water bodies and the elements described below form a network of watercourses across the River Wensum floodplain. The Phase 1 habitat survey focused on the terrestrial bankside and emergent vegetation, but for more information on the aquatic macrophyte communities and the hydro-morphology of these stretches refer to (WSP UK Ltd., 2018d) and (WSP UK Ltd., 2018e) respectively.

River Wensum

- 4.5.42. An approximately 160m stretch of the Wensum was included within the Scheme. The stretch surveyed was bordered by mature willows and occasionally dense strips of semi-mature willows, bankside vegetation was dominated by reed sweet grass with nettle also frequent, other species occasionally present included reed canary grass, common reed, and branched bur-reed *Sparganium erectum*. Emergent species noted included arrowhead *Sagittaria sagittifolia*, yellow water-lily *Nuphar lutea*, yellow flag iris *Iris pseudacorus*, and fool's watercress.

Stream on southern floodplain boundary

- 4.5.43. A stream which bounds the southern extent of the floodplain and the northern side of Rose Carr was present within the Scheme. This approximately 3m wide stream is fairly clear of vegetation cover with yellow flag iris frequent along its length with fool's water cress also occasional. Adjacent vegetation varies from grazed short sward grassland within its western section, to more varied floodplain grazing marsh along the central and western sections, dense swathes of nettle are present occasionally. There is evidence of excessive poaching of the banks by cattle.

Foxburrow stream

- 4.5.44. The Foxburrow stream located approximately 20m south of the Foxburrow plantation flows west-east through wet meadow and marshy grassland habitats (**Figure G-5**). The stream itself is heavily vegetated and choked by it in places, with bramble, nettle, bittersweet *Solanum dulcamara*, fool's water cress, bracken, red campion, soft rush, creeping thistle, broad-leaved dock, and elder. Some more accessible sections of the bank are also heavily cattle poached.

ARABLE – INTENSIVE – J1.1

- 4.5.45. This habitat type was the most abundant within the Scheme; covering a 99.91ha area it was encountered consistently throughout (**Figure G-8**). The dominant crop recorded was wheat *Triticum* spp., constituting the majority of the intensive arable land encountered. Other crops grown within in this habitat type included corn *Zea mays*, potato *Solanum tuberosum*, carrot *Daucus carota* subsp. *sativus* and cabbage *Brassica* sp.
- 4.5.46. The margins of the intensive arable were consistently species-poor, with the exception of purposefully sown wildflower buffer strips which have been described separately. Grass species that were commonly recorded within arable margins included perennial rye-grass, cock's-foot, sterile brome *Bromus sterilis*, and false-oat grass. Forbs were present in low diversity, common arable weeds recorded included field penny cress *Thlaspi arvense*, common fiddleneck *Amsinckia menziesii*, viper's bugloss *Echium vulgare*, garlic mustard *Alliaria petiolata*, field-forget-me-not *Myosotis arvensis*, and common poppy *Papaver rhoeas*.
- 4.5.47. Corn spurry *Spergula arvensis* was also recorded within an arable margin within the centre of the Site (TG 11640 14039), this plant is listed as Vulnerable in The Vascular Plant Red Data List for Great Britain (Cheffings & Farrell, 2005). However, despite this status this plant is commonly distributed throughout the UK and occurs frequently in waste ground, gardens, and road verges etc .

AMENITY GRASSLAND – J1.2

- 4.5.48. Two gardens with amenity lawns were incorporated within the Scheme; totalling 1.38ha these lawns comprised short sward regularly mown areas of perennial rye grass and red fescue, with accompanying species including daisy, white clover, and ribwort plantain.

TALL RUDERAL – J1.3

- 4.5.49. An area of tall ruderal vegetation located to the north of Weston Road, 0.81ha in size, with the most abundant species being mugwort, other frequent species included nettle, bristly ox-tongue, white dead nettle, and false oat-grass. Toad rush *Juncus bufonius*, ragwort, and broadleaved dock were also recorded within this habitat type.

INTRODUCED SHRUBS – J1.4

- 4.5.50. Small patches of introduced shrubs were present within the garden areas, species included Japanese laurel *Aucuba japonica*, Oregon grape *Mahonia* sp., and butterfly bush *Buddleja davidii*.

DITCH – J2.6

- 4.5.51. Two ditches were present within the floodplain, these consisted of partially wet linear depressions dominated by marginal aquatic and scrub vegetation. Wet sections of the ditches are dominated by reed-sweet grass *Glyceria maxima*, with reed canary-grass *Phalaris arundinacea*, common reed *Phragmites australis*, and greater tussock sedge *Carex paniculata* as accompanying species. Sections of the ditches are choked with scrub, with dense goat willow, hawthorn, alder, bramble, nettle, and blackthorn present.
- 4.5.52. A dry ditch was also present along the length of a hedgerow within the central section of the Scheme.

Wet ditch north of Wensum

- 4.5.53. A still / very slow flowing, shallow ditch 50m north of the Wensum was present within the Scheme. The surface was covered by duckweed *Lemna minor*. The stream was bounded by steep banks dominated by perennial rye-grass and nettle and fenced off from arable land on both sides. A very recently planted hawthorn hedge was present along the northern side.

BUILDING – J3.6

- 4.5.54. Three buildings are present within the Scheme, which includes two warehouse / outbuildings associated with a residential property within the north of the Site just south of Fakenham Road, and a horse stable within the paddocks south of Weston Road.

BARE GROUND – J4

- 4.5.55. The majority of this habitat type comprises an area of land that is utilised for rearing pigs for part of the year. This section of bare ground is occasionally vegetated with species including mugwort, groundsel *Senecio vulgaris*, and white dead nettle. Sections on the margins of this bare ground area contained an abundance of common cudweed *Filago vulgaris*, which is listed as Near Threatened in The Vascular Plant Red Data List for Great Britain (Cheffings & Farrell, 2005). However, this assessment is based on a decline in this plant's range mainly in the north and west of the UK and has always been frequent in the east.
- 4.5.56. A sand school associated with the horse paddocks is the other area within the Scheme to have been categorised as bare ground.



HARD STANDING – J5

4.5.57. Hard standing in the form of roads, access tracks, and laybys comprises a 4.57ha area within the Scheme.

5 REFERENCES

5.1 PROJECT REFERENCES

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Appendix A

RELEVANT LEGISLATION

ENGLAND & WALES LEGISLATION AND POLICY CONTEXT

This report has been compiled with reference to relevant wildlife legislation, planning policy and the UK Biodiversity Framework. An overview and context of relevant legislation is provided, with the relevant protection each species groups or species receives summarised in Table 1.

The Wildlife and Countryside Act 1981, (as amended) (WCA)

Protected birds, animals and plants are listed under Schedules 1, 5, 8 and 9 respectively of the WCA, a description of these Schedules and their meaning is provided below.

Under the WCA (England and Wales) all birds, their nests and eggs (with exception of species listed under Schedule 2) are protected by the WCA. It is an offence to:

- Intentionally kill, injure, or take any wild bird,
- Take or destroy an egg of any wild bird.
- Damage or destroy the nest of any wild bird (whilst being built, or in use). Under the WCA the clearance of vegetation within the survey area boundary, or immediately adjacent to the survey area during the bird nesting season could result in an offence occurring by the disruption or destruction of nest sites. The bird breeding season can be taken to occur between March - August inclusive, although is subject to variations based on species, geographical and seasonal factors.

Schedule 1

Birds listed under Schedule 1 of the WCA⁷ are afforded additional protection with regard to intentional or reckless disturbance whilst nest-building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Schedule 5

Species listed in Schedule 5 can either be fully protected or be partially protected under Section 9, which makes it unlawful to intentionally:

Part 1: kill, injure or take;

Part 2: possess or control (live or dead animal, part or derivative);

Part 4 (a): damage or destruct any structure used for shelter or protection;

Part 4 (b): disturb them in a place of shelter or protection;

Part 4 (c): obstruct access to place of shelter or protection;

Part 5 (a): sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative);

Part 5 (b): advertise for buying or selling.

⁷ To view the current list of Schedule 1 listed birds visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/1>.

Schedule 8

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

Schedule 9

Invasive species listed under Schedule 9 are prohibited from release into the wild and the Act prohibits planting or “causing to grow” in the wild of any plant species listed in Schedule 9. It should be noted that certain bird species listed on Schedule 1 of the WCA are also listed on Schedule 9 to prevent release of non-native and captive individuals, this includes barn owl, red kite, goshawk and corncrake.

Countryside Rights of Way Act 2000 (CRoW Act)

The CRoW Act has amended the WCA in England and Wales strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and the legal protection for threatened species. It adds the word ‘reckless’ to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.

Natural Environment and Rural Communities (NERC) Act 2006

Species and Habitats of Principal Importance in England and Wales are listed under Section 41 and Section 42 respectively of the NERC Act. The Section 41 and 42 lists detail species that are of principal importance for the conservation of biodiversity in England and Wales, and should be used to guide decision-makers such as local and regional authorities when implementing their duty to have regard for the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act 2006.

The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012)

This Framework lists the UK’s most threatened species and habitats and sets out targets and objectives for their management and recovery. The UK Biodiversity Action Plan (BAP) process is delivered nationally, regionally and locally and should be used as a guide for decision-makers to have regards for the targets set by the framework and the goals they aim to achieve. The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant (UK Post-2010 Biodiversity Framework, 2012⁸).

⁸ JNCC and Defra (on behalf of the Four Countries’ Biodiversity Group), July 2012, UK Post-2010 Biodiversity Framework, Available from: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf.

The Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations came into force on 30th November 2017 and extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters). In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland.

All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations it is unlawful to:

- Deliberately kill, capture or disturb;
- Deliberately take or destroy the eggs of; and
- Damage or destroy the breeding site/resting place of any species protected under this legislation.
- If the Ecologist determines that impacts to an EPS are unavoidable then the works may need to be carried out under a site specific mitigation licence from Natural England (NE) or Natural Resources Wales (NRW). Low Impact Class licences are also available in both England and Wales for bats and great crested newts. This enables Registered Low Impact Consultants to undertake certain low impact activities reducing the EPS application paperwork and process length.

Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation. This means these species are a relevant consideration in a Habitats Regulations Assessment (HRA).

The Birds Directive seeks to maintain populations of all wild bird species across their natural range (Article 2). All bird species listed under Annex I⁹ of the Birds Directive are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs), these are also designated under all regularly occurring migratory species, with regard to the protection of wetlands of international importance (Article 4). This means these bird species and communities are a relevant consideration in HRA.

⁹ To view birds listed under Annex I visit:

http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm.

Appendix B

**SITE LOCATION AND STATUTORY
DESIGNATED SITES (SEE
SEPARATE DOCUMENT)**

Appendix C

**NON-STATUTORY DESIGNATED
SITES (SEE SEPARATE DOCUMENT)**

Appendix D

**HABITATS OF PRINCIPAL
IMPORTANCE MAP (SEE SEPARATE
DOCUMENT)**

Appendix E

**PHASE 1 HABITAT MAP (SEE
SEPARATE DOCUMENT)**

Appendix F

PLANT SPECIES LIST

Common name	Latin name	Frequency (DAFOR)
Perennial rye-grass	<i>Lolium perenne</i>	D
Red fescue	<i>Festuca rubra</i>	A
Cock's-foot	<i>Dactylis glomerata</i>	A
False oat - grass	<i>Arrhenatherum elatius</i>	A
Tufted hair grass	<i>Deschampsia cespitosa</i>	F
Marsh foxtail	<i>Alopecurus geniculatus</i>	O
Barren brome	<i>Bromus sterilis</i>	O
Yorkshire fog	<i>Holcus lanatus</i>	O
Meadow foxtail	<i>Alopecurus pratensis</i>	O
Creeping bent grass	<i>Agrostis stolonifera</i>	O
Annual meadow grass	<i>Poa annua</i>	O
False brome	<i>Brachypodium sylvaticum</i>	O
Field wood rush	<i>Luzula campestris</i>	O
Oxeye daisy	<i>Leucanthemum vulgare</i>	A
Bird's-foot trefoil	<i>Lotus corniculatus</i>	F
Common knapweed	<i>Centaurea nigra</i>	F
White clover	<i>Trifolium repens</i>	F
Yarrow	<i>Achillea millefolium</i>	F
dandelion	<i>Taraxacum agg.</i>	F
Soft rush	<i>Juncus effusus</i>	A
Cuckoo flower	<i>Cardamine pratensis</i>	O
Common vetch	<i>Vicia sativa</i>	F
Meadow vetchling	<i>Lathyrus pratensis</i>	O
Lesser stitchwort	<i>Stellaria graminea</i>	O

Common name	Latin name	Frequency (DAFOR)
Water mint	<i>Mentha aquatica</i>	O
Thale cress	<i>Arabidopsis thaliana</i>	O
Brooklime	<i>Veronica beccabunga</i>	O
Self-heal	<i>Prunella vulgaris</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	F
Fool's watercress	<i>Apium nodiflorum</i>	F
bittersweet	<i>Solanum dulcamara</i>	O
Bugle	<i>Ajuga reptans</i>	O
Sheep's sorrel	<i>Rumex acetosella</i>	O
Ragwort	<i>Senecio jacobaea</i>	F
Marsh foxtail	<i>Galium palustre</i>	O
groundsel	<i>Senecio vulgaris</i>	O
Water forget-me-not	<i>Myosotis scorpioides</i>	O
silverweed	<i>Potentilla anserina</i>	O
Musk thistle	<i>Carduus nutans</i>	O
Lesser spearwort	<i>Ranunculus flammula</i>	R
Marsh thistle	<i>Cirsium palustre</i>	O
Greater stitchwort	<i>Stellaria holostea</i>	R
Mugwort	<i>Artemisia vulgaris</i>	A
Ribwort plantain	<i>Plantago lanceolata</i>	A
Toad rush	<i>Juncus bufonius</i>	R
Broad-leaved dock	<i>Rumex obtusifolius</i>	A
hogweed	<i>Heracleum sphondylium</i>	O
Viper's bugloss	<i>Echium vulgare</i>	O

Common name	Latin name	Frequency (DAFOR)
Common cudweed	<i>Filago vulgaris</i>	O
Common nettle	<i>Urtica dioica</i>	A
Field bindweed	<i>Convolvulus arvensis</i>	O
Purple loosestrife	<i>Lythrum salicaria</i>	R
Black medick	<i>Medicago lupulina</i>	O
Creeping thistle	<i>Cirsium arvense</i>	F
Cow parsley	<i>Anthriscus sylvestris</i>	F
Field pennycress	<i>Thlaspi arvense</i>	O
Common fiddleneck	<i>Amsinckia menziesii</i>	O
Thyme-leaved speedwell	<i>Veronica serpyllifolia</i>	O
Common comfrey	<i>Symphytum officinale</i>	O
Common flax	<i>Linum usitatissimum</i>	R
White dead nettle	<i>Lamium album</i>	F
Common bluebell	<i>Hyacinthoides non-scripta</i>	O
Scarlet pimpernel	<i>Anagallis arvensis</i>	R
Red campion	<i>Silene dioica</i>	O
Small nettle	<i>Urtica urens</i>	O
Black horehound	<i>Ballota nigra</i>	R
Herb robert	<i>Geranium robertianum</i>	A
Red clover	<i>Trifolium pratense</i>	F
Ground ivy	<i>Glechoma hederacea</i>	A
Common fumitory	<i>Fumaria officinalis</i>	O
Common ivy	<i>Hedera helix</i>	A
Common toadflax	<i>Linaria vulgaris</i>	R

Common name	Latin name	Frequency (DAFOR)
Creeping buttercup	<i>Ranunculus repens</i>	A
Curled dock	<i>Rumex crispus</i>	F
Early forget-me-not	<i>Myosotis ramosissima</i>	O
Common stork's-bill	<i>Erodium cicutarium</i>	O
Corn spurry	<i>Spergula arvensis</i>	R
Hard rush	<i>Juncus inflexus</i>	O
Common mouse-ear chickweed	<i>Cerastium fontanum</i>	O
Common hemp-nettle	<i>Galeopsis tetrahit</i>	R
Cleavers	<i>Galium aparine</i>	A
Sainfoin	<i>Onobrychis viciifoli</i>	O
Pendulous sedge	<i>Carex pendula</i>	O
Wood avens	<i>Geum urbanum</i>	O
Dog's mercury	<i>Mercurialis perennis</i>	O
Moschatel	<i>Adoxa moschatellina</i>	O
Greater tussock sedge	<i>Carex paniculata</i>	O
Water chickweed	<i>Myosoton aquaticum</i>	R
Yellow flag iris	<i>Iris pseudacorus</i>	O
Arrowhead	<i>Sagittaria sagittifolia</i>	R
Branched bur-reed	<i>Sparganium erectum</i>	R
Reed sweet-grass	<i>Glyceria maxima</i>	F
Common reed	<i>Phragmites australis</i>	O
Reed canary grass	<i>Phalaris arundinacea</i>	O
Oak	<i>Quercus robur</i>	A
Sycamore	<i>Acer pseudoplatanus</i>	A

Common name	Latin name	Frequency (DAFOR)
Beech	<i>Fagus sylvatica</i>	O
Field maple	<i>Acer campestre</i>	O
Ash	<i>Fraxinus excelsior</i>	F
Hornbeam	<i>Carpinus betulus</i>	R
alder	<i>Alnus glutinosa</i>	F
Hybrid black poplar	<i>Populus x canadensis</i>	O
Hawthorn	<i>Crataegus monogyna</i>	A
Cherry	<i>Prunus avium</i>	O
Blackthorn	<i>Prunus spinosa</i>	F
Spindle	<i>Euonymus europaeus</i>	O
European aspen	<i>Populus tremula</i>	O
Oregon grape	<i>Mahonia sp.</i>	O
Silver birch	<i>Betula pendula</i>	O
Leyland cypress	<i>Cupressus x leylandii</i>	O
Rowan	<i>Sorbus aucuparia</i>	O
Willow	<i>Salix sp.</i>	R
Japanese laurel	<i>Aucuba japonica</i>	R
Butterfly bush	<i>Buddleja davidii</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R

Appendix G

HABITAT PHOTOGRAPHS



Figure G-1 - Floodplain grazing marsh.



Figure G-2 - Semi-improved grassland, arable and woodland



Figure G-3 - Poor-semi improved grassland.



Figure G-4 - Pond in Rose Carr.



Figure G-5 - Foxburrow stream.



Figure G-6 - Foxburrow Plantation.



Figure G-7 - The Broadway.



Figure G-8 - Intensive arable.



Figure G-9 - Marshy grassland.



Figure G-10 - Long Plantation.



Figure G-11 - Ringland Lane.



Figure G-12 - Sown grassland.



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