



# High Speed Two Phase 2a (West Midlands - Crewe)

## Background Information and Data

Ecology and biodiversity

Ecological baseline data - phase 1 habitat survey

(BID-EC-002-000)



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## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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# 1 Introduction

1.1.1 This report presents a summary of the ecological baseline data following a phase 1 habitat survey.

1.1.2 Ecological baseline data has been collected for High Speed Rail (West Midlands to Crewe). The Proposed Scheme that will pass through the following community areas (CA):

- CA1: Fradley to Colton;
- CA2: Colwich to Yarlet;
- CA3: Stone and Swynnerton;
- CA4: Whitmore Heath to Madeley; and
- CA5: South Cheshire.

1.1.3 This report should be read in conjunction with Map Series EC12 in the Background Information and Data, Ecology Map Books.

1.1.4 The following baseline ecology reports can also be referred to:

- Ecological baseline data - protected and or notable flora (Background Information and Data: BID-EC-003-000);
- Ecological baseline data - national vegetation classification and ancient woodland (Background Information and Data: BID-EC-004-000);
- Ecological baseline data – hedgerows (Background Information and Data BID-EC-005-000);
- Ecological baseline data - river habitat, river corridor, and ditch surveys, (Background Information and Data: BID-EC-006-000);
- Ecological baseline data - amphibian and pond surveys (Background Information and Data: BID-EC-007-000);
- Ecological baseline data – reptiles (Background Information and Data: BID-EC-8-000);
- Ecological baseline data - breeding and wintering birds (Background Information and Data: BID-EC-009-000);
- Ecological baseline data - otter and water vole (Background Information and Data: BID-EC-010-000);
- Ecological baseline data - hazel dormouse (Background Information and Data: BID-EC-011-000);
- Ecological baseline data – bats (Background Information and Data: BID-EC-12-000);
- Ecological baseline data - white clawed crayfish and other invertebrate

(Background Information and Data: BID-EC-013-000); and

- Ecological baseline data – fish (Background Information and Data: BID-EC-014-000).

1.1.5 Note that baseline data for badger is not made publically available due to the historic persecution of this species.

1.1.6 The ecological assessment is detailed in the High Speed Rail (West Midlands – Crewe) Environmental Statement (ES)<sup>1</sup>:

- Volume 2, Community area reports;
- Volume 3, Route-wide effects;
- Volume 4, Off-route effects; and
- Volume 5, Appendices.

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<sup>1</sup> HS2 Ltd (2017), *High Speed Rail (West Midlands – Crewe) Environmental Statement (ES)*, [www.gov.uk/HS2](http://www.gov.uk/HS2)

## 2 Phase 1 habitat survey

### 2.1 Methodology

- 2.1.1 Details of the standard methodology used for extended phase 1 habitat surveys are provided in Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS) included in the Scope and Methodology Report (SMR) Addendum, see Volume 5: Appendix CT-001-002.
- 2.1.2 Where access has not been available for field survey, data from Staffordshire and Cheshire phase 1 habitat audit survey data has been utilised to provide a description of habitats relevant to the assessment. In all other cases, interpretation of aerial photography has been used to provide an indication of the likely habitats present.
- 2.1.3 Desk study information relevant to the Phase 1 habitat survey was obtained from the following sources:
- Staffordshire Ecological Records Centre<sup>2</sup>;
  - rECOrd for Cheshire area<sup>3</sup>;
  - Natural England's National Inventory of Ancient Woodlands;
  - Natural England mapping of habitats of principal importance in England identified in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)<sup>4</sup>; and
  - Historic Ordnance Survey (OS) maps used to assess presence of historic woodland.
- 2.1.4 The baseline descriptions of different habitat types are described in an order that follows the Proposed Scheme in a south to north direction. Cross references are given where National Vegetation Classification<sup>5</sup> (NVC) surveys have also been carried out, see Background Information and Data: BID-EC-004-000.

### 2.2 Deviations, constraints and limitations

- 2.2.1 Due to the continuous nature of the phase 1 survey scope it is not considered useful to attempt to identify individual locations where survey work was not undertaken.
- 2.2.2 In many locations it has not been possible to determine the precise habitat type for phase 1 mapping. This is due to a number of reasons including:
- field surveys undertaken to date have been limited to locations where landowner permission was obtained;
  - where access was not granted or was granted too late in the season for field assessment, aerial photography, OS maps and, where available, data from pre-

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<sup>2</sup> Staffordshire Ecological Record, *The Ecological Database for Staffordshire*, [http://www.staffs-ecology.org.uk/html2015/index.php?title=Main\\_Page](http://www.staffs-ecology.org.uk/html2015/index.php?title=Main_Page)

<sup>3</sup> rECOrd Local Biological Records Centre serving Cheshire, <http://www.record-lrc.co.uk/>

<sup>4</sup> *Natural Environment and Rural Communities Act 2006 (Chapter 16)*, London. Her Majesty's Stationery Office

<sup>5</sup> NVC is a detailed survey and classification system that is used to compare plant communities with a range of defined community types



existing phase 1 habitat surveys has been utilised to inform the assessment, particularly for CA5 where access was most constrained;

- in some areas where access was granted this was subject to significant restrictions associated with game management. Such restrictions particularly affected access to a number of woodland sites; and
- where access was not obtained for survey, an assumption has been made that hedgerows are intact and species-rich.

2.2.3 A small number of phase 1 habitat surveys were conducted outside the optimal survey period when many plant species are not in evidence, and others are hard to identify, especially in the winter months. It is possible that some species may have been overlooked at these sites however sufficient information was gathered to allow for broad habitat descriptions and identification of notable habitats.

## 2.3 Baseline

### Fradley to Colton (CA1)

2.3.1 Access was obtained to approximately 67% of the area of land required for the construction of the Proposed Scheme and a 250m buffer from this boundary.

2.3.2 Land in and adjacent to land required for construction of the Proposed Scheme includes the Trent and Mersey Canal, Pyford Brook, Bourne Brook, the River Trent and Moreton Brook. Habitats consist of arable fields with surrounding woodland and semi-natural ancient woodland.

### *Woodland*

2.3.3 There are 144 woodland blocks and clusters scattered throughout, or directly adjacent to, the length of the route in the Fradley to Colton community area. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:

- 19ha of semi-natural broadleaved woodland;
- 0.6ha of semi-natural mixed woodland;
- 1.1ha of plantation broadleaved woodland;
- 0.3ha of plantation mixed woodland; and
- 2.1ha of plantation coniferous woodland.

2.3.4 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which is likely to qualify as a lowland mixed deciduous woodland, a habitat of principal importance, and includes the following:

- Little Lyntus Wood, an ancient semi-natural woodland, and Big Lyntus, a Local Wildlife Site (LWS)<sup>6</sup> and mixed semi-natural broadleaved including planted

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<sup>6</sup> In Staffordshire the Wildlife Trust identifies Local Wildlife Sites (LWS) (previously known as Sites of Biological Importance (SBI))

broadleaves and planted conifers with a diverse groundflora including bluebell (*Hyacinthoides non-scripta*) and yellow archangel (*Lamium galeobdolon*), are located west of Fradley Business Park;

- Westfield Covert, a woodland that lies within the land required for the construction of the Proposed Scheme. On the basis of the heritage review undertaken by HS2 Ltd, Natural England has confirmed that Westfield Covert is of potential relevance to the assessment in this area and will be added to the Ancient Woodland Inventory (AWI). Westfield Covert is adjacent to a large unnamed water body, located north of the A513 Rugeley Road. Species include sycamore (*Acer pseudoplatanus*), hawthorn (*Crateagus monogyna*), holly (*Ilex aquifolium*), hazel (*Corylus avellana*) and ash (*Fraxinus excelsior*). It is part of Kings Bromley Pit, north-west of Manor Park, LWS;
- Riley Hill Biodiversity Alert Site (BAS), which includes Shaw Lane Gap Wood, comprises old sand and gravel pits, part flooded to provide pools for angling which are surrounded by mature broadleaved woodland;
- Cranberry, 800m west of Fradley Junction, the woodland here largely comprises planted broadleaved woodland about 20+ years old with no ancient woodland indicators. Dominant species were field maple (*Acer campestre*) and wild cherry (*Prunus avium*);
- Shaw Lane Farm Wood, consisting of pedunculate oak (*Quercus robur*) and ash are co-dominant within the canopy; hawthorn is abundant, with holly and blackthorn occasional within the understorey. The field layer is dominated by bramble (*Rubus fruticosus agg.*) with occasional common nettle (*Urtica dioica*) and rough-stalked feather-moss (*Brachythecium rutabulum*). Several ancient woodland indicator species are present including bluebell and dog's mercury (*Mercurialis perennis*);
- Hurst Wood, located north of the junction of Stonyford Road and Blithbury Road. The woodland is likely partly planted, dominated by mature oak of relatively uniform age with ash, beech (*Fagus sylvatica*) and wych elm (*Ulmus glabra*). The understorey is relatively sparse comprising little more than occasional elder (*Sambucus nigra*), whilst ground flora largely dominated by patchy dense bramble with wood false-brome (*Brachypodium sylvaticum*) and bluebell;
- Hurstwood Pit, located north of the junction of Stonyford Road and Blithbury Road. Ash and poplar (*Populus nigra*) are dominant in the canopy and hawthorn and hazel are dominant in the understorey. The field layer is dominated by nettles and cleavers (*Galium aparine*) but included the ancient woodland indicator species dog's mercury;
- Spencer's plantation, located west of the B5013 and south of Wilderley Barn;
- a woodland near Pipewood Cottage Farm, the northern half of this wood is dominated by field maple and wild cherry and a number of ancient woodland indicator species including, bluebell and wood anemone (*Anemone nemorosa*). The southern part comprises wet woodland and is dominated by crack willow

(*Salix fragilis*) and alder (*Alnus glutinosa*) with an understorey including great willow herb (*Epilobium hirsutum*) and bittersweet (*Solanum dulcemara*); and

- five small areas of broadleaved woodland within the Rugeley grid connection area containing elements of mature and semi-mature broadleaved woodland.

2.3.5 There are also several semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme:

- woodland east of Woodend Common Barn;
- John's Gorse Ancient and Semi-natural Woodland (ASNW) and LWS and Hanchwood House Wood AWI, with sycamore, hazel and rowan (*Sorbus aucuparia*) in the canopy;
- Cawarden Springs Wood is a LWS and mostly ancient semi-natural woodland;
- Ravenshaw Wood, Black Slough and Slaish LWS is comprised of the contiguous areas of woodland known as The Slaish, east of The Slaish, Black Slough, and Ravenshaw Wood that is connected to the other woods by a small block of grassland with scattered trees. Part of the site is ancient semi-natural woodland and part ancient replanted woodland with even aged canopy of pedunculated oak;
- Vicar's Coppice BAS lies adjacent to the A515, Lichfield Road, and is an ancient semi-natural broadleaved woodland. The canopy is dominated by pedunculate oak with some birch with a degraded ground flora and the remaining scrub layer dominated by rhododendron. The BAS lies approximately 320m south-east of the Proposed Scheme; however, it is part of the woodland complex in this area and is connected to the Ravenshaw Wood, Black Slough and Slaish LWS;
- Woodend Lock, north of the Trent and Mersey Canal, part of the wider wood connected to Woodend Lock LWS, and is comprised of mature pedunculate oak with alder;
- two small woodlands in the Fradley junction area;
- three woodlands east of Handsacre, New Plantation, Little Spinney and Rookery Plantation. The invasive species Himalayan balsam (*Impatiens glandulifera*) was recorded in Rookery Plantation;
- woodland in the East of Trentside Meadows LWS, is comprised of willow, alder, hawthorn, ash, silver birch (*Betula pendula*) and oak;
- Pipe Wood AWI;
- two small areas of woodland north and south of Stonyford Lane;
- two unnamed woodlands to the east and west borders of Trentside Meadows LWS. The east woodland is comprised of willow, alder, hawthorn, ash, silver birch and oak. Understorey includes bramble and nettles. The west woodland is just south of Hall Farm, Pipe Ridgeway and is comprised of ash, oak, willow and hazel;

- Lawn Spinney and three woodland areas surrounding Colton Hall Farm are adjacent to the Rugeley grid connection; and
- two unnamed woods North of Moor Lane.

- 2.3.6 Semi-natural mixed woodland is found in one area within the land required for the construction for the Proposed Scheme within the Rugeley grid connection, north of New House and Cawarden Springs Wood LWS.
- 2.3.7 There is also one area of semi-natural mixed woodland directly adjacent to the land required for the construction of the Proposed Scheme east of Springs Cawarden Farm and Cawarden Springs Wood LWS.
- 2.3.8 Plantation broadleaved woodland is found in four areas within the land required for the land required for the construction of the Proposed Scheme: at Fradley Wood BAS, Rice's spinney, Tomlinson's spinney and an unnamed woodland south-east of Stockwell Heath.
- 2.3.9 There are also four plantation broadleaved woodland areas directly adjacent to the land required for the construction of the Proposed Scheme south-west of Alrewas Hayes, within Trentside Meadows LWS, on Common Lane north of Bar Farm and west of Woodend Common Barn.
- 2.3.10 Plantation mixed woodland is found in two areas within the land required for the construction for the Proposed Scheme at Woodgate north of Crawley Lane and south of Moor Lane Stockwell Heath.
- 2.3.11 There is also one small plantation coniferous woodland east of Woodend Common Barn that lies within the land required for the construction of the Proposed Scheme.

### *Scrub*

- 2.3.12 Few areas of scrub were recorded. Of those areas surveyed tree species included hawthorn, willow and elder with bramble, nettle and rosebay willowherb (*Chamerion angustifolium*) as dominant species within the ground layer. Scrub habitat comprises 1.8ha within the land required for the construction of the Proposed Scheme.

### *Hedgerows*

- 2.3.13 In total, 65km of hedgerow habitat was recorded within the land required for the construction of the Proposed Scheme. This includes:
- 4.7km of intact species-rich hedgerow;
  - 6km of intact species-poor hedgerow;
  - 2km of defunct native species-rich hedgerow;
  - 3.9km of defunct species-poor hedgerow;
  - 3.7km of native species-rich hedgerow with trees; and
  - 2.5km of species-poor hedgerow with trees.

- 2.3.14 Hedgerows that comprise native species qualify as a habitat of principal importance. Typical woody species include pedunculate oak, hawthorn, holly, rose (*Rosa sp.*), alder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

#### *Parkland and scattered trees*

- 2.3.15 There are no large areas of parkland or scattered trees within the Fradley to Colton community area but mature tree-lines are found at some field boundaries which include relict hedges and veteran trees. Both broadleaved and mixed trees are present, dominant species include willow, English oak, pedunculated oak, ash, alder, Leyland cypress (*Cupressus × leylandii*), sycamore, beech and elm.

#### *Grassland and marsh*

- 2.3.16 The main grassland type in the Fradley to Colton community area is improved grassland used for cattle grazing (145.7ha), poor semi-improved (5.3ha). Semi-improved grassland with occasional marshy areas is present to a much lesser extent. These are found at the following locations:

- Trentside Meadows LWS, on the Trent floodplain, qualifies as coastal floodplain grazing marsh, a habitat of principal importance. Grassland habitats found during survey are associated with well-drained pastures, are homogenous and subject to cattle grazing; the site lies partially within the land required for the construction of the Proposed Scheme;
- Lount Farm LWS on the boundary of the Fradley to Colton and the Colwich to Yarlet community areas. Comprises lowland hay meadow, currently managed as species rich lowland meadow with high forb density and lies partially within the land required for the construction of the Proposed Scheme; and
- the Trent Valley floodplain near Handsacre is within the land required for the construction of the Proposed Scheme and may qualify as floodplain grazing marsh, a habitat of principal importance and local BAP<sup>7</sup> habitat.

#### *Watercourses*

- 2.3.17 The five main watercourses that are crossed by the Proposed Scheme are:
- areas of the Trent and Mersey Canal;
  - Pyford Brook is a moderately flowing brook, approximately 2m wide and 0.3m deep, between arable fields with steep-sided banks. The bankside vegetation is mostly open, dominated by bramble and nettle, but there are woodland blocks adjacent in some areas. It flows into the King's Bromley Wharf to Fradley Junction, Coventry Canal LWS, 200m south of land required for the construction of the Proposed Scheme, a site noted for diverse emergent and marginal vegetation;

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<sup>7</sup> Staffordshire Wildlife Trust, *Staffordshire Biodiversity Action Plan (BAP)*, Staffordshire Biodiversity Action Plan Steering Group

- Bourne Brook is a 2m wide and 0.5m deep watercourse which flows under road and through semi-natural broadleaved woodland. There is scattered scrub down to the channel on both banks with nettle, hawthorn, holly and thistle;
- the River Trent is a slow flowing wide river with Trentside Meadows LWS providing a floodplain at Netherton; and
- Moreton Brook connects to the River Trent as well as other smaller water bodies. The water depth is between 0.2–0.4m and has little aquatic vegetation. Trees including alder, hawthorn and sycamore were recorded along both banks. The banks support areas of sparse ruderal vegetation and bare ground, due to heavy shading. The adjacent fields are cattle grazed.

2.3.18

Nine smaller watercourses were identified in the area of land required for the construction of the Proposed Scheme. They are mostly low flowing watercourses associated with arable land with bank vegetation dominated by dense bramble and gorse scrub:

- Ashby Stitch is a small brook that flows into Ravenshaw Wood, Black Slough and Slaish LWS;
- Crawley Brook flows from New Plantation to Tomlinson’s Spinney woodland;
- drain at Echils farm, south of Rookery Lodge;
- Luth Burn watercourse;
- an unnamed tributary of Bentley Brook south-west of Blithbury that flows through a small semi-natural broadleaved woodland;
- an unnamed watercourse west of Blithbury, from Woodley Gate Lane;
- an unnamed tributary of the Moreton Brook that flows through Stockwell Heath;
- an unnamed tributary of Moreton Brook that crosses the B5013 Uttoxeter Road; and
- an unnamed tributary of the Moreton Brook near Jonghams Cottage is a 1m wide seasonally dry ditch. The vegetation within the ditch is made up of a mixture of short and tall grasses, rushes willowherbs and semi aquatic and aquatic species, including; watercress, bittersweet (*Celastrus orbiculatus*), great willowherb (*Epilobium hirsutum*), floating sweet grass (*Glyceria fluitans*), and soft rush (*Juncus effusus*). The bankside vegetation is an unmanaged strip of around 1m wide which includes, cocks foot (*Dactylis glomerata*), hogweed, (*Festuca spp*), Yorkshire fog (*Holcus lanatus*) and bentgrass (*Agrostis spp.*).

### *Water bodies*

2.3.19

King's Bromley Wharf to Fradley Junction, Coventry Canal LWS, within the land required for the construction of the Proposed Scheme, are two lengths of canal that meet at Fradley Junction that support diverse bands of both marginal and emergent vegetation, which include several uncommon and rare species within the county.

2.3.20 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 316, including the Rugeley connection. This includes:

- 38 within the area of land required for the construction of the Proposed Scheme;
- 103 between 100m and the area of land required for the construction of the Proposed Scheme;
- 73 between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- 102 between 250m and 500m from the area of the land required for the construction of the Proposed Scheme.

2.3.21 Ditch surveys were carried out in six locations:

- Pyford Brook, ditch not heavily modified and supporting a range of aquatic fauna;
- near Bromley Wharf marina, containing standing water but heavily choked by vegetation. The invasive species Himalayan balsam was recorded at this location;
- Ashby Stitch, no notable flora and ditch not permanently wet;
- Trentside Meadows, still ditch with no evidence of management between two grazed fields;
- Luth Burn, a dry overgrown ditch within improved grassland, common flora present; and
- Moreton Brook at Lount Farm LWS, ditch in a boggy area within lowland hay meadow.

2.3.22 Most water bodies within the Proposed Scheme are ponds set within agricultural land or residential gardens, often surrounded by woodland copses. Ditches are typically associated with the watercourses. Part of a large lake north of the A513 Rugeley Road, west of King's Bromley, is within 100m of land required for the construction of the Proposed Scheme and connects to the River Trent.

2.3.23 There is a large pond at Rugeley Power Station Club which is likely to be used recreationally. Nine ponds have been identified from aerial photography within the grid connection location. There is a significant cluster of ponds at New Barn 400m west of Blithbury Road and south of Hollow Lane. Another cluster is present at the north of the connection route at Hurst Wood Farm and is within land required for the construction of the Proposed Scheme.

#### *Arable and cultivated land*

2.3.24 The habitat audit data from Staffordshire and Cheshire Biological Records Centre and aerial photos show that this area is dominated by arable fields with occasional hedgerows and trees. Arable land comprises 401ha of land required for the

construction of the Proposed Scheme in this area. Most areas of farmland surveyed did not identify areas of arable set aside. One area of field margins, at Bentley Farm, south of Blithbury did support some interesting arable weeds on the field edges, including small bugloss (*Anchusa arvensis*) and chamomile (*Matricaria recutita*).

### *Buildings and structures*

- 2.3.25 There are 85 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.
- 2.3.26 There are concentrations of residential buildings at Riley Hill, Kings Bromley, Blithbury and Stockwell Heath that are either within or directly adjacent to the land required for the construction of the Proposed Scheme.

### **Colwich to Yarlet (CA2)**

- 2.3.27 Access was obtained to approximately 51.8% of the area of land required for the construction of the Proposed Scheme in CA2 and a 250m buffer from this boundary.
- 2.3.28 Land in and adjacent to land required for construction of the Proposed Scheme includes the Trent and Mersey Canal and River Trent. Habitats consist of arable fields with surrounding woodland and semi-natural ancient woodland and areas of parkland and amenity associated with Ingestre golf course.

### *Woodland*

- 2.3.29 There are 123 woodland blocks and clusters scattered throughout, or directly adjacent to, the length of the route in the Colwich to Yarlet community area. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
  - 12.4ha of semi-natural broadleaved woodland,
  - 0.06ha of semi-natural mixed woodland;
  - 4.7ha of plantation broadleaved woodland; and
  - 2.4ha of plantation mixed woodland.
- 2.3.30 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which is likely to qualify as a lowland mixed deciduous woodland, a habitat of principal importance, and includes the following:
  - Flushing Covert / Town Field Plantation is a broadleaved semi-natural woodland within the land required for the construction of the Proposed Scheme. The woodland is located between Lionlodge Covert LWS and Ingestre Park Golf Course with an additional area within the golf course. It is dominated by mature pedunculate oak with lime, poplar, sycamore, and ash is also present. Natural England has confirmed this woodland is of potential relevance to the assessment in this area and will be added to the AWI;
  - three woodlands within Ingestre Park Golf Course and Ingestre Wood;
  - The Grove, located on Yarlet Hill;



- three small woodlands around Moreton House, including a pond surrounded by mature oak, willow, hawthorn, marginal vegetation and abundant reed sweet-grass;
- a small woodland at Tithebarn Farm;
- a small woodland to the south of the Hoomill Cottages, dominated by ash and wych elm with an understorey dominated by elder and hawthorn;
- two unnamed woodlands, north and south-west of Upper Haynards;
- two small woodland strips along unnamed tributaries of the Kingston Brook east of Lower Berryhill and south of Hopton; and
- Lower Berryhill, a broadleaved woodland plantation, and Upper Berryhill, a small deciduous semi-natural broadleaved woodland, are located south of the Staffordshire Showground.

2.3.31 There are also several areas of semi-natural broadleaved woodland located adjacent to the land required for the construction of the Proposed Scheme:

- Tithebarn Covert and Jewstrump Covert are semi-natural broadleaved woodlands with some features of mixed woodland areas with pine trees. Natural England has confirmed Tithebarn Covert is of potential relevance to the assessment in this area and will be added to the AWI;
- Lambert's Coppice, west of Ingestre Park. Natural England has confirmed this woodland is of potential relevance to the assessment in this area and will be added to the AWI;
- areas of semi-natural broadleaved woodland adjacent to the River Trent near Hoo Mill, Thatchholme Covert, east of Little Ingestre and Lion Lodges, a small sub-section of Lionlodge LWS;
- areas of woodland associated with Ingestre Park Golf Course, north of the Club House, south of Mill Lane and west of Upper Haynards;
- multiple broadleaved woodland areas around Hopton, including woodland areas surrounding Hopton Pools LWS, two small woodlands north of Hopton Lane near St. Peter's Chapel, a very small unnamed wood along a dismantled railway and a woodland east of Hopton Farm, adjacent to Sandon Road; and
- within the Yarlet area there is a small traditional orchard at Newbuildings Farm, south-west of the Proposed Scheme, Yarlet Wood, a semi-natural woodland near Grove Cottage and a semi-natural broadleaved woodland and small area of traditional orchard at Yarlet School, dominated by mature pedunculate oak, ash and sycamore.

2.3.32 Semi-natural mixed woodland is found in one area within the land required for the construction for the Proposed Scheme, Lionlodge Covert, which is a LWS and large semi-natural mixed woodland that supports several ancient woodland indicator species in the ground flora.

- 2.3.33 There are also two areas of semi-natural mixed woodland directly adjacent to the Proposed Scheme, one at Ford's Belt and the woodland associated with Tixall Pool Covert BAS and Blackheath Covert (Fox Covert).
- 2.3.34 There are three areas of plantation broadleaved woodland within the land required for the construction of the Proposed Scheme west of Tithebarn Farm, five small blocks on the south-east side of Ingestre Park Golf Course and north-west of Hilltop Farm.
- 2.3.35 There is also one plantation broadleaved woodland directly adjacent to the Proposed Scheme, New Plantation BAS, located west of Yarlet School contains two small areas of standing water flanked by arable land and semi-improved grassland.
- 2.3.36 Plantation mixed woodland is found in two areas within the land required for the construction for the Proposed Scheme, at Little Covert and a noteworthy belt of woodland on the west side of Ingestre Park Golf Course that connects with Bricklawn Covert and Ingestre Wood.
- 2.3.37 There is also one area of plantation mixed woodland directly adjacent to the Proposed Scheme just to the south of Ingestre Park Golf Club. There is a small woodland that is predominantly mixed plantation woodland with semi-natural broadleaved woodland in the north-west corner. The mixed plantation woodland contains Scots pine, sycamore, beech, elder, larch (*Larix spp*), sweet chestnut, hawthorn, pedunculate oak, rowan and field maple. The broadleaved woodland is dominated by small leaved lime (*Tilia cordata*) with horse chestnut (*Aesculus hippocastanum*), sycamore, elder, hazel and beech. Throughout is an understorey of nettle, with snowberry (*Symphoricarpos albus*), elder, box leaved honeysuckle (*Lonicera pileata*) and bramble.

### Scrub

- 2.3.38 Scrub was recorded scattered along field edges and surrounding ponds. Species include bramble, common nettle, dogwood, hawthorn, elder, beech and hornbeam (*Carpinus betulus*). Concentrated areas of scrub were noted in Ingestre Park Golf Course and in the surrounding area at Hopton Pools. Scrub habitat comprises 0.5ha within the land required for the construction of the Proposed Scheme.

### Hedgerows

- 2.3.39 In total 33.9km of hedgerow habitat was recorded within the land required for the construction of the Proposed Scheme. This includes:
- 22.4km of intact species-rich hedgerow;
  - 5.5km of intact species-poor hedgerow;
  - 0.4km of defunct native species-rich hedgerow;
  - 1.7km of defunct species-poor hedgerow;
  - 0.8km of native species-rich hedgerow with trees; and
  - 3.1km of species-poor hedgerow with trees.
- 2.3.40 Hedgerows that comprise native species qualify as a habitat of principal importance. Typical woody species include pedunculate oak, hawthorn, blackthorn, rose sp., alder and elder.

- 2.3.41 There are no hedgerows designated as LWS within 250m of the Proposed Scheme.
- 2.3.42 Most of the arable fields are bordered by hedgerows. Hedgerow species recorded include hawthorn, blackthorn, elder, holly, dogwood, rose sp., beech, and hazel. Mature trees found within these hedgerows include pedunculate oak, alder, sycamore, willow and ash.

#### *Parkland and scattered trees*

- 2.3.43 Scattered trees are present throughout the Colwich to Yarlet community area including pedunculate oak, willow, hawthorn, blackthorn, alder, elder and ash. The Ingestre Park Golf Club contains several small strips of parkland and planted scattered trees. Species present within the area of the Proposed Scheme include poplar, lime, pedunculate oak, silver birch and cherry. Within 100m of the Proposed Scheme, wellingtonia (*Sequoiadendron giganteum*) is present and approximately 170m north of the area of the Proposed Scheme is a mature horse-chestnut.

#### *Grassland and marsh*

- 2.3.44 Pasturefields Salt Marsh Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is of international importance for its inland salt meadow, an Annex 1<sup>8</sup> priority habitat. The site is located 270m north of the Proposed Scheme, to the east of Ingestre, and is considered the best example in the UK of a natural salt spring and inland salt meadow. The salt meadow habitat is characterised by red fescue (*Festuca rubra*), with saltmarsh rush (*Juncus gerardii*), sea plantain (*Plantago maritima*), common saltmarsh-grass (*Puccinellia maritima*), lesser sea-spurrey (*Spergularia marina*) and sea arrowgrass (*Triglochin maritima*). The site is connected to the coastal and floodplain grazing marsh along the River Trent that is within the Proposed Scheme.
- 2.3.45 There is one LWS designated for its grassland habitat that falls within the land required for the construction of the Proposed Scheme, Lount Farm LWS, north-east of Colwich and adjacent to Moreton Brook. Lount Farm consists of unimproved neutral grassland which is likely to qualify as a lowland hay meadow, a habitat of principal importance. The species recorded on site include Yorkshire fog, sweet vernal grass (*Anthoxanthum odoratum*) and red fescue.
- 2.3.46 Grassland and marsh habitat likely to qualify as habitats of principal importance within the land required for the construction of the Proposed Scheme include the following:
- floodplain grazing marsh in the valley of the River Trent near Great Haywood is likely to qualify as coastal and floodplain grazing marsh. The area mainly comprises of arable, improved and semi-improved grassland. The improved grassland in the area is dominated by perennial rye-grass with the semi-improved grasslands containing abundant perennial rye-grass (*Lolium perenne*), Yorkshire fog, crested dog's-tail (*Cynosurus cristatus*) and meadow barley (*Hordeum secalinum*); and

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<sup>8</sup> European Commission (1992), *Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Annex 1)*

- to the south of Toldish Lane is an area of grassland which is likely to qualify as lowland meadow.

2.3.47 The grassland habitat within the land required for the construction of the Proposed Scheme is dominated by improved (161ha), poor semi-improved (24ha), semi-improved (10ha) and amenity (14ha) grassland.

- improved grassland is found throughout the area and is dominated by Yorkshire fog and perennial ryegrass;
- poor semi-improved grassland is typically found around farmsteads; and
- semi-improved grassland, with an area of 15ha and includes perennial ryegrass, Yorkshire fog, crested dog's-tail, meadow barley, white clover (*Trifolium repens*) dock species (*Rumex sp.*) and creeping thistle (*Cirsium arvense*); and Amenity grassland is found within Ingestre Park Gold Course, residential areas and surrounding the Staffordshire Show Ground, utilised for show-jumping.

### *Watercourses*

2.3.48 The main watercourses that are crossed by the Proposed Scheme are the River Trent and the Trent and Mersey Canal.

2.3.49 There are eight unnamed ordinary watercourses that are crossed by the Proposed Scheme:

- a tributary of Moreton Brook to the east of Grange Farm;
- west of Tithebarn Farm;
- south of Toldish Lane;
- within Lionlodge covert;
- a tributary of the Kingston Brook to the east of Lower Berryhill;
- south of Hopton pools;
- south of Marston; and
- north of Yarlet.

2.3.50 Most are shallow and associated with intensive agricultural land with some small patches of woodland although the watercourse to the east of Grange Farm runs through Lount Farm LWS, a marshy wet meadow.

2.3.51 There are five additional unnamed small watercourses associated mainly with arable land within the Proposed Scheme which are subject to permanent diversions.

### *Water bodies*

2.3.52 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 191. This includes:

- thirty-three within the area of land required for the construction of the Proposed Scheme;
- thirty-seven between 100m and the area of land required for the construction of the Proposed Scheme;
- fifty-eight between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- sixty-three between 250m and 500m from the area of land required for the construction of the Proposed Scheme.

2.3.53 Tixall Park Pool BAS lies directly adjacent to the land required for the construction of the Proposed Scheme, south-west of Ingestre Park Golf Course, and is designated for the large pool and marginal vegetation. Ponds in the Colwich to Yarlet community area are mostly within woodlands or arable fields or semi-improved grasslands, surrounded by trees and marginal vegetation.

2.3.54 The Great Haywood Marina contains landing stages, canal boats and has vegetated banks with an area of open water to the north for boat mooring.

#### *Arable and cultivated land*

2.3.55 The majority of the land within the area required for the Proposed Scheme is dominated by arable fields (187ha) a small amount of cultivated land consists of ephemeral / short perennial. Arable land is frequently lined with hedgerows and scattered trees. The areas of farmland that were surveyed included arable set-aside land but no species-rich arable margins were surveyed.

#### *Buildings and structures*

2.3.56 There are 121 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme and 613 buildings within 100m from the area of land required for the construction of the Proposed Scheme.

2.3.57 There are concentrations of residential buildings at Hopton, Marston and Yarlet that are within and directly adjacent to the land required for the construction of the Proposed Scheme. Great Haywood residential buildings are directly adjacent to the land required for the construction of the Proposed Scheme.

#### **Stone and Swynnerton (CA3)**

2.3.58 Access was obtained to approximately 78.9% of the area of land required for the construction of the Proposed Scheme and a 250m buffer from this boundary.

2.3.59 Land in and adjacent to land required for construction of the Proposed Scheme consists of arable fields and multiple areas woodland associated with the Swynnerton estate. Woodland and ancient semi- natural woodland fall within the land required for the construction of the Proposed Scheme.

#### *Woodland*

2.3.60 There are 189 woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in the Stone and

Swynnerton community area. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:

- 25.0ha of semi-natural broadleaved woodland,
- 6.6ha of semi-natural mixed woodland;
- 2.6ha of plantation broadleaved woodland;
- 0.4ha of plantation mixed woodland; and
- 3.5ha plantation coniferous woodland.

2.3.61 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which is likely to qualify as a lowland mixed deciduous woodland, a habitat of principal importance, and includes the following:

- Clifford's Wood LWS will be added to the AWI due to the potential relevance to the assessment in this area, as confirmed by Natural England. Clifford's Wood is associated with a series of adjacent smaller woodlands that lie to the north-west of the site. These woodlands are utilised for the rearing of pheasants and include various pens and feeding structures for this purpose. Clifford's Wood comprises a mosaic of semi-natural broadleaved woodland dominated by pedunculate oak and beech with lime, sycamore and mixed plantation woodland with oak, scots pine and larch, with an introduced understorey of cherry laurel (*Prunus laurocerasus*) and rhododendron and a bluebell dominated ground flora. A number of mature beech and oak trees are located along the northern edge of the woodland. The smaller woodlands associated with Clifford's Wood are a similar mixture of broadleaved and conifer plantation, many of which support a ground flora dominated by bluebell;
- Poolhouse Wood is an LWS and a damp deciduous woodland formed from two separate woodland blocks dominated by ash and alder with an understorey dominated by bramble with frequent fern species;
- Fox Covert is partially included within the area designated as Highlow Meadows LWS, it is dominated by alder and sycamore, with an area of pine plantation at the western end;
- five small unnamed woodland areas surrounding ponds scattered throughout the arable field at Walton Heath;
- a small woodland block, 500m west of Darlaston Grange, north of Yarnfield lane;
- a line of five woodland blocks with ponds along arable field margins east of the M6 at Fox Covert;
- three woodland areas surrounding Blakelow. These comprise young scrubby woodland that has established around the margins of two ponds with

agricultural fields surrounding on all sides of the woodlands. Species present include beech, sycamore and ash;

- Lodge Covert is a large linear woodland bisected by the M6 motorway, the section to the north-east of the M6 is designated as a LWS. It is comprised of sycamore, hornbeam, ash, silver birch, oak and holly with a ground flora of bracken, bluebells, brambles and nettles;
- a small woodland area directly north of The Stretters, separated by lane and hedgerow; and
- Cash's Pit, a woodland north of the A51. The dominant species is birch with ash, beech, sycamore, a hazel understorey and bluebell dominant ground flora.

2.3.62 There are also several areas of semi-natural broadleaved woodland located directly adjacent to the land required for the construction of the Proposed Scheme:

- Swynnerton Old Park LWS consists of Swynnerton Old Park and Nursery Common and is listed as an Ancient Woodland Inventory Site (AWIS). The LWS is directly adjacent to the Proposed Scheme at Nursery Common. These woodlands have a similar character comprising semi-natural broadleaved areas, broadleaved plantation dominated by larch and areas of pine dominated conifer plantation. The ground flora has a heath character dominated by bracken (*Pteridium aquilinum*), with areas including ancient woodland indicator species such as dog's mercury, lords and ladies (*Arum maculatum*) and bluebell;
- Darlaston Wood is a large woodland east of the M6 within the Darlaston Park area. Areas of this woodland comprise of the Darlaston Wood LWS, 188m north-east, and ancient replanted woodland;
- Pirehill, north of LWS consists of a large fishing pool and a stretch of wet woodland, a habitat of principal importance, to the west;
- Closepit Plantation LWS is dominated by sycamore with a series of heavily shaded eutrophic pools. It is adjacent to the A51, situated between Stabhill Plantation and Sandyford Farm and is directly adjacent on three sides to the land required for the construction of the Proposed Scheme;
- Hatton Common LWS is a half semi-natural woodland with rowan and half coniferous plantation woodland with silver birch and Scots pine;
- a woodland at Darlaston Grange, adjacent to Yarnfield Lane;
- an area of woodland north of Hall Lane at the Shrubs, Calloway Pit and Closepit Plantation;
- Eastwood, located roughly opposite Cash's Pit on the southern side of the A51; and
- Hatton Rough, located north east of Clifford's Wood, with pedunculate oak, European beech, willow and alder.

- 2.3.63 Semi-natural mixed woodland is found in two areas within the land required for the construction for the Proposed Scheme, as follows:
- Birchwood is a small area of wet woodland, a habitat of principal importance. It is located on the northern end of Highlow Meadows LWS, west of the M6 and is dominated by beech and sycamore; and
  - a small area of semi-natural mixed woodland with sycamore, lime and ash species, north of the Tittensor Road and Stab Lane junction and an associated block just south of Tittensor Road in Swynnerton.
- 2.3.64 There are also two areas of semi-natural mixed woodland directly adjacent to the Proposed Scheme, within the Shrubs south of Hall Lane and The Stretters.
- 2.3.65 Plantation broadleaved woodland is found in two areas within the land required for the construction of the Proposed Scheme, Stabhill Plantation and a small woodland north of the A51 with connectivity to The Stretters.
- 2.3.66 There are also three plantation broadleaved woodland areas directly adjacent to the Proposed Scheme: at Stone Golf Course near Filly Brook; within the Shrubs; and an unmanaged orchard that has developed into scrubby broadleaved woodland at the corner of a large field north east of the A519 – A51 roundabout.
- 2.3.67 Plantation mixed woodland is found in one area within the land required for the construction for the Proposed Scheme, a small woodland block on the north-west corner of Walton Heath Farm, surrounded by arable and improved grassland.
- 2.3.68 There are also two areas of plantation mixed woodland directly adjacent to the Proposed Scheme, at the Shrubs and two woodlands north-east of Cliffords Wood, Black Bank at the corner of the A51 and Common Lane and a woodland block approximately 80m east of The Hattons.
- 2.3.69 There are five areas of plantation coniferous woodland within the land required for the construction of the Proposed Scheme one at The Compound, three north-west of Clifford’s Wood and one south east of Hatton Rough.
- 2.3.70 There are also two areas of plantation coniferous woodland directly adjacent to the Proposed Scheme at the Shrubs, north of Hall Lane and three areas of woodland north-east of Clifford’s Wood, one along the Common Lane track north of The Hattons and two clustered blocks approximately 140m west of New Waste Plantation.

### *Scrub*

- 2.3.71 Both dense/continuous and scattered scrub occurred in random patches within some land parcels. Scrub was recorded along woodland edges and surrounding ponds. Species include holly, rose sp., bramble, grey willow (*Salix cinerea*), elder, hawthorn, and blackthorn. Scrub habitat comprises up to 2.3ha within the land required for the construction of the Proposed Scheme.

### *Hedgerows*

- 2.3.72 In total, 45.6km of hedgerow habitat was recorded in the land required for the construction of the Proposed Scheme. This includes:



- 19.3km of intact species-rich hedgerow;
- 11.1km of intact species-poor hedgerow;
- 2.7km of defunct native species-rich hedgerow;
- 3.9km of defunct species-poor hedgerow;
- 3.7km of native species-rich hedgerow with trees; and
- 4.9km of species-poor hedgerow with trees.

2.3.73 Hedgerows that comprise native species qualify as a habitat of principal importance. Typical woody species include pedunculate oak, hawthorn, blackthorn, rose sp., field maple and elder.

2.3.74 There are no hedgerows designated as LWS within 250m of the Proposed Scheme.

2.3.75 Most of the arable fields are bordered by hedgerows. Mature trees are found within these hedgerows including oak, alder, sycamore, willow and ash. Hedgerow species recorded include hawthorn, blackthorn, elder, holly, rose sp., field maple and hazel. Other species noted in these hedgerows are crab apple (*Malus sylvestris*) and wild cherry.

#### *Parkland and scattered trees*

2.3.76 Stone Golf Course is an area of parkland adjacent to Filly Brook LWS and Yarnfield Lane that is partially within the land required for the construction of the Proposed Scheme along the existing rail line to the south-east side of the site.

2.3.77 Swynnerton Park, a large area of parkland located to the east of Swynnerton, south and west of Lodge Covert, is partially within the land required for the construction of the Proposed Scheme. Many of the trees are mature specimens and include a potential veteran oak. These scattered trees are located within improved pasture grassland between larger blocks of broadleaved woodland. Tree species present include pedunculate oak, ash, lime, sycamore and horse chestnut.

2.3.78 The majority of scattered trees within the Stone and Swynnerton community area are within hedgerows at field boundaries, many of which are within the land required for the construction of the Proposed Scheme. The number of scattered trees through the rest of this area is limited, with a small number of fields supporting individual or a handful of scattered trees. Many of these trees are mature specimens of pedunculate oak or ash.

#### *Grassland and marsh*

2.3.79 The main grassland type in the Stone and Swynnerton community area is improved grassland used for cattle grazing (143ha), amenity grassland (4.0ha), poor semi-improved (10ha) and neutral semi-improved (23ha). Semi-improved grassland with occasional marshy areas is present to a much lesser extent.

2.3.80 Filly Brook LWS is a watercourse and area of semi-improved neutral grassland and damp pasture west of Stone, within the land required for the construction of the Proposed Scheme. The floodplain of Filly Brook appears to be unmanaged with areas of scattered willow scrub and tall ruderals. The dominant grass is Yorkshire-fog

reflecting the wet nature of the grassland. In the absence of detailed surveys, it is assumed on a precautionary basis to meet the criteria of lowland meadows, a habitat of principal importance.

- 2.3.81 Highlow Meadows LWS, west of the M6 and within the land required for the construction of the Proposed Scheme, supports a range of semi-natural grassland habitat types including semi-improved grassland and species-rich marshy grassland (Purple Moor-grass and Rush Pasture habitat of principal importance). However, following NVC survey in this area, the species composition is more characteristic of NVC MG4 *Alopecurus pratensis-Sanguisorba officinalis* grassland, not the Purple Moor-grass and Rush Pasture it was originally identified as. The area surveyed has a marshy characteristic and is representative of lowland meadow habitat of principal importance.
- 2.3.82 Two areas of marshy grassland, south of Beatty Hall BAS, have been identified alongside an unnamed stream to the north of Yarnfield. The larger of these two areas of marshy grassland is located directly adjacent to the land required for construction of the Proposed Scheme, the latter within 100m of the Proposed Scheme. In the absence of a detailed survey of this grassland it is assumed to qualify as coastal and floodplain grazing marsh, a habitat of principal importance.
- 2.3.83 The most common grassland recorded during the field study was improved grassland which was generally dominated by perennial rye-grass with frequent white clover and creeping buttercup (*Ranunculus repens*). There are also many areas along the route of semi-improved and poor semi-improved neutral grassland within the land required for the construction of the Proposed Scheme, extending up to and beyond the 100m buffer. Species encountered in areas of semi-improved grassland often include a mixed composition of meadow fox tail (*Alopecurus pratensis*), cock's foot, Yorkshire fog, false oat-grass (*Arrhenatherum elatius*), rough meadow-grass (*Poa trivialis*), perennial rye-grass, red fescue, creeping bent (*Agrostis stolonifera*), timothy (*Phleum pratense*), crested dog's tail (*Cynosurus cristatus*) and sweet vernal grass.
- 2.3.84 A small area of unimproved neutral grassland exists along the northern boundary of Dog Lane, within the land required for the construction of the Proposed Scheme.

### *Watercourses*

- 2.3.85 The main watercourses crossed by the Proposed Scheme are:
- an unnamed watercourse, tributary of River Trent, at Pirehill House approximately 0.1m deep with a sandy, stony substrate that flows north-easterly towards a large pond along an intact species-poor hedgerow and within a semi-natural broadleaved woodland with elm, willow, holly, ash, hawthorn, oak, elder and hazel present;
  - an unnamed watercourse within Walton Heath Farm arable field along an intact species-poor hedgerow;
  - Filly Brook Millstream passing Pool House Wood LWS and under the M6;
  - three unnamed tributary streams/drains at Highlow Meadows LWS, flowing from the semi-natural broadleaved woodland through an area of neutral semi-improved grassland;

- a number of watercourses associated with woodlands at Lodge Covert, at Tittensor Road near Sandyford Farm, within Clifford's Wood, two watercourses that flow around the Hatton Rough woodland area; and
- a tributary to Meece Brook at Bent Lane, Shelton under Harley, flowing south-westerly along a hedgerow adjacent to arable and improved grassland.

2.3.86 There are three unnamed minor watercourses that are crossed by the Proposed Scheme:

- Yarnfield Lane;
- east of Tittensor Road; and
- west of Closepit Plantation.

#### *Water bodies*

2.3.87 The LWS north of Pirehill consists of a large fishing pool and stretch of wet woodland, surrounded by semi-improved and improved agricultural land and is within the land required for the construction of the Proposed Scheme.

2.3.88 Lower Hatton BAS is 217m south-west from the Proposed Scheme and has a small pond with diverse marginal vegetation.

2.3.89 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 246. This includes:

- 70 ponds are within the area of land required for the construction of the Proposed Scheme;
- 61 ponds are between 100m and the area of land required for the construction of the Proposed Scheme;
- 51 ponds are between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- 64 ponds are between 250m and 500m from the area of land required for the construction of the Proposed Scheme.

2.3.90 Few of the water bodies within the Stone and Swynnerton community area were garden ponds in residential areas. The majority of ponds surveyed are located within arable fields or semi-improved grasslands on farmsteads, often surrounded by bramble and nettle scrub. Ponds were also found in many of the woodland areas along the route.

#### *Arable and cultivated land*

2.3.91 The majority of land take within the Proposed Scheme is dominated by arable fields (240ha) bordered by hedgerows, with occasional scattered trees in the fields.

#### *Buildings and structures*

2.3.92 Within the Stone and Swynnerton community area there is a low density of buildings within or adjacent to the area of land required for the construction of the Proposed

Scheme. Eighty-eight buildings lie within the land required for the construction of the Proposed Scheme and 614 buildings lie within 100m of the Proposed Scheme.

- 2.3.93 The majority of buildings within the area are isolated farmsteads. There is one small area of residential properties near Swynnerton town centre within 100m of the land required for the construction of the Proposed Scheme. Both Stone and Yarnfield town centres are located outside of the 500m buffer.

### **Whitmore Heath to Madeley (CA4)**

- 2.3.94 Access was obtained to approximately 72.3% of the area of land required for the construction of the Proposed Scheme and a 250m buffer from this boundary.
- 2.3.95 Land in and adjacent to land required for construction of the Proposed Scheme consists of two main watercourses, River Meece and the River Lea. Arable fields and multiple areas of woodland are present including Whitmore Wood AWIS.

### *Woodland*

- 2.3.96 There are 86 woodland blocks and clusters scattered throughout, or directly adjacent to, the length of the route in the Whitmore Heath to Madeley community area. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 20.6ha of semi-natural broadleaved woodland;
  - 0.04ha of semi-natural mixed woodland;
  - 0.2ha of plantation broadleaved woodland;
  - 6.8ha of plantation mixed woodland; and
  - 6.1ha of plantation coniferous woodland.
- 2.3.97 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which is likely to qualify as a lowland mixed deciduous woodland, a habitat of principal importance, and includes the following:
- Whitmore Wood is an AWIS and is located within the land required for the construction of the Proposed Scheme. The canopy is dominated by downy birch (*Betula pubescens*) with occasional rowan. Other areas of the wood consist of plantation on ancient woodland, where the middle and the south-west corner sections of the woodland are dominated by coniferous plantations, such as larch and western red cedar (*Thuja plicata*). In total, 11 vascular plant species indicative of ancient woodland are present. Part of this woodland is listed as lowland mixed deciduous woodland, which is a habitat of principal importance;
  - Barhill Wood is an AWIS and is listed as lowland mixed deciduous woodland, dominated by sycamore and pedunculate oak. Rowan and sycamore dominate the understorey with occasional elder and five vascular plant species that are indicative of ancient woodland were recorded in the ground cover;

- Hey Sprink, wood south-west of, includes birch, alder, rowan and hawthorn. Natural England has confirmed this woodland is of potential relevance to the assessment in this area and will be added to the AWI;
- unnamed wood south of Hey Sprink, Natural England has confirmed this woodland is of potential relevance to the assessment in this area and will be added to the AWI. The woodland comprises species including oak, alder, goat willow (*Salix caprea*) and holly;
- unnamed strip of woodland adjacent to Bent Lane at Meece Brook, is dominated by oak and lime species with elder, hazel, willow sp., hawthorn, wych elm, sycamore, ash, bracken and nettle;
- one area of woodland at Whitmore Heath, dominated by silver birch, sessile oak (*Quercus petraea*) and downy birch;
- an unnamed woodland bordering the disused Silverdale Line of the Stoke to Market Drayton Railway connects to the south-west boundary of Hey Sprink; and
- three woodlands around Manor Farm and Hey House and a small strip along the West Coast Main Line (WCML).

2.3.98 There are also several areas of semi-natural broadleaved woodland located directly adjacent to the land required for the construction of the Proposed Scheme:

- Hey Sprink is listed on the AWI and is an ancient replanted woodland site. The woodland at Hey Sprink may qualify as a lowland mixed deciduous woodland, a habitat of principal importance and conservation priority of the local BAP. The area of woodland adjacent to the Proposed Scheme is semi-natural broadleaved woodland. There is also a large area of mixed semi-natural woodland and small pockets of coniferous plantation woodland. Within the semi-natural woodland area, the canopy is dominated by downy birch and sycamore. Hazel is occasional. In total, nine vascular plant species indicative of ancient woodland were recorded;
- unnamed woodland at the Lum, River Lea corridor, LWS and Grafton's Wood LWS are both listed on the AWI;
- Wrinehill Wood, east of BAS, Natural England has confirmed this woodland is of potential relevance to the assessment in this area and will be added to the AWI. The woodland is dominated by alder, silver birch, rowan and oak and consists of a number of narrow, scattered woodland remnants;
- Wrinehill Wood is listed on the AWI and qualifies as lowland mixed deciduous woodland and is comprised of alder, silver birch, rowan, and oak;
- a woodland around Whitmore town, along Meece Brook;
- Moat Wood and Brickyard Wood LWS;
- multiple woodland areas throughout Whitmore Heath. One block, south of the A53 is dominated by mature beech with some scattered patches of broad

buckler fern (*Dryopteris austriaca*), bluebell and bracken. The woodland areas in the centre of Whitmore Heath are dominated by silver birch;

- one small strip of woodland north-east of Whitmore Wood;
- two small unnamed woodlands north of Red Lane at Bar Hill. Species recorded include sycamore, holly, hazel, ash, elder and willow. Ground cover includes ferns, tufted hair grass (*Deschampsia cespitosa*), red campion (*Silene dioica*) and foxglove (*Digitalis purpurea*);
- woodland areas on either side of the WCML north of the A525 in Madeley;
- two woodland blocks east of Wrinehill Wood, north-west of Beechfields with alder, silver birch, rowan and oak. Ground flora consists of wood avens (*Geum urbanum*), bluebell, opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*), herb Robert (*Geranium robertianum*), red campion, tufted hair grass and wavy hair grass (*Deschampsia flexuosa*);and
- a small unnamed woodland at Wrinehill Mill, adjacent to a water body and north east of Wrinehill Hall.

2.3.99 Plantation broadleaved woodland is found in one area within the land required for the construction for the Proposed Scheme, a small woodland connected to a semi-natural broadleaved woodland, just south of the A525 near Bar Hill House.

2.3.100 Plantation mixed woodland is found in one area directly adjacent to the land required for the construction for the Proposed Scheme, a strip of woodland adjacent to the west side of the WCML near Hey House. Species includes semi-mature to mature Scot's pine, lime and horse chestnut with an elder and hawthorn understorey.

### Scrub

2.3.101 Scrub was recorded along field edges, around ponds, alongside woodlands and along the railway corridor. Species included holly, rose sp., bramble, hawthorn, blackthorn, ash and elder. Scrub habitat comprises 0.1ha within the land required for the construction of the Proposed Scheme.

### Hedgerows

2.3.102 In total, 22.7km of hedgerow habitat was recorded within the land required for the construction of the Proposed Scheme. This includes:

- 9.6km of intact species-rich hedgerow;
- 4.6km of intact species-poor hedgerow;
- 1.8km of defunct native species-rich hedgerow;
- 1.8km of defunct species-poor hedgerow;
- 2.6km of native species-rich hedgerow with trees; and
- 2.3km of species-poor hedgerow with trees.

2.3.103 Hedgerows that comprise native species qualify as a habitat of principal importance. Typical woody species include pedunculate oak, hawthorn, rowan, field maple, holly, rose sp., alder, elder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

2.3.104 There are no hedgerows designated as LWS within 250m of the Proposed Scheme.

#### *Parkland and scattered trees*

2.3.105 There are no areas of parkland within the land required for the construction of the Proposed Scheme; however scattered trees are present throughout. This includes lines of trees and small clusters.

#### *Grassland and marsh*

2.3.106 The majority of grassland within the land required for the construction of the Proposed Scheme is improved grassland (192ha), with smaller scattered areas of species poor semi-improved grassland (28ha) and neutral semi-improved (21ha). Small areas of unimproved grassland (3ha) and amenity grassland (2.2ha). Areas of more diverse grassland are found at the following locations:

- marshy grassland to the east of Meece Brook is representative of lowland meadow habitat of principal importance and a conservation priority of the local BAP. The presence of quaking-grass, yellow-rattle (*Rhinanthus minor*), betony, field scabious (*Knautia arvensis*) and meadow crane's-bill are indicative of unimproved meadow. Crested dog's tail, common birds-foot trefoil, red fescue, Yorkshire fog and common knapweed (*Centaurea nigra*) are abundant and present across the meadow. Lady's bedstraw and yellow oat-grass (*Trisetum flavescens*) are locally abundant;
- marshy grassland south of Hey Sprink Wood and the WCML. Species include tall sedges, common reed, soft rush, meadowsweet (*Filipendula ulmaria*) and reedmace (*Typha latifolia*). This grassland is listed as coastal and floodplain grazing marsh, a habitat of principal importance;
- neutral unimproved grassland is present south of the A53 Newcastle Road, within the land required for the construction of the Proposed Scheme. Grassland is dominated by Yorkshire fog, rough meadow grass and yellow oat-grass. Herbaceous plants include common knapweed, hedge bedstraw (*Galium mollugo*), lady's bedstraw (*Galium verum*), meadow crane's-bill (*Geranium pratense*), field scabious, common bird's-foot-trefoil (*Lotus corniculatus*), musk mallow (*Malva moschata*), ribwort plantain (*Plantago lanceolata*), meadow buttercup (*Ranunculus acris*), yellow-rattle, common sorrel (*Rumex acetosa*), broad-leaved dock (*Rumex obtusifolius*), common ragwort (*Senecio jacobaea*), ragged robin (*Silene flos-cuculi*), bladder campion (*Silene vulgaris*), red clover (*Trifolium pratense*) and white clover. The grassland is likely to be representative of lowland meadow, a habitat of principal importance.
- neutral species rich semi improved grassland occurs within fields adjacent to Meece Brook, within the land required for the construction of the Proposed Scheme. Species include knapweed, common sorrel, sweet vernal grass, birds foot trefoil (*Lotus corniculatus*), cocks foot, hogweed, buttercup (*Ranunculus*

sp), vetch (*Vicia sativa*), mouse ear (*Cerastium fontanum*), cowslip (*Primula veris*), cranesbill (*Geranium* sp.) and oxeye daisy (*Leucanthemum vulgare*).

- acid grassland north of Barhill Wood may qualify as lowland acid grassland, a habitat of principal importance and local BAP habitat. The habitat is dominated by bent grass (*Agrotis* sp) with other species including tormentil (*Potentilla erecta*), bird's foot trefoil, scabious, cat's ear (*Hypochaeris radicata*), sheep's sorrel (*Rumex acetosella*), harebell (*Campanula rotundifolia*) and mouse ear.

### Watercourses

2.3.107 The main watercourses crossed by the Proposed Scheme are:

- Meece Brook, the River Lea and several smaller watercourses will be crossed by the Proposed Scheme. The River Lea and Meece Brook may qualify as habitats of principal importance;
- River Lea, a 1-2m wide and less than 0.5m deep watercourse with moderate flow, low turbidity and a gravel base. Vegetation adjacent to the river includes foals watercress (*Apium nodiflorum*), meadowsweet, foxglove and male fern (*Dryopteris filix-mas*); and
- Checkley Brook, from east of the WCML to west of Wrinehill Mill, flows south-westerly to connect with the River Lea tributary. The aquatic vegetation within the watercourse is limited to yellow iris (*Iris pseudacorus*) and it has a heavily vegetated margin of great willowherb, and is shaded by a broadleaved semi-natural woodland strip on its northern bank.

2.3.108 There are eight additional unnamed smaller watercourses that are crossed by the Proposed Scheme:

- four small and shallow unnamed watercourses situated within the Whitmore Heath and Whitmore Wood area. One flows through a grassland while the other three are partially shaded by the woodland with vegetation including hazel, ash, elder, bluebell, elegant silk-moss (*Pseudotaxiphyllum elegans*), rough-stalked meadow-grass, opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*), enchanter's nightshade (*Circaea lutetiana*), golden saxifrage, ramsons (*Allium ursinum*), yellow archangel and wood sorrel (*Oxalis acetosella*);
- three drains east of the WCML and south of the disused Silverdale Line of the Stoke to Market Drayton Railway. The watercourses are small with dense riparian vegetation including willowherb, soft rush, wild angelica (*Angelica sylvestris*), reed grass (*Phragmites australis*), nettle, false oat grass (*Arrhenatherum elatius*), elder, yellow flag (*Iris pseudocorus*) and goat willow;
- two small watercourses joining River Lea from the west near Wrinehill Wood, surrounded by cattle-grazed improved grassland with perennial rye grass (*Lolium perenne*), broad leaved dock, annual meadow grass (*Poa annua*) and white clover; and



- a watercourse that separates from Checkley Brook at Main Road, flowing south along the WCML and across to the overflow at Wrinehill Mill.

2.3.109 There are three additional unnamed smaller watercourses that are directly adjacent to the land required for the construction of the Proposed Scheme:

- a small, shaded unnamed watercourse that runs parallel to Whitmore Heath to the east; and
- an unnamed watercourse that flows through Wrinehill Wood (east of) and another within Wrinehill Wood. Both flow north to meet the River Lea just south of Wrinehill Hall.

### *Water bodies*

2.3.110 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 143. This includes :

- 30 within the area of land required for the construction of the Proposed Scheme;
- 44 between 100m and the area of land required for the construction of the Proposed Scheme;
- 32 between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- 37 between 250m and 500m from the area of land required for the construction of the Proposed Scheme.

2.3.111 Few were garden ponds in residential areas. The majority of the ponds surveyed are within arable fields / improved pasture often surrounded by bramble and nettle scrub.

### *Arable and cultivated land*

2.3.112 This area contains large areas of arable farmland (73.7ha) set within the wider rural landscape. The areas of farmland that were surveyed included areas of arable set-aside land but no species-rich arable margins were surveyed.

### *Buildings and structures*

2.3.113 There are 40 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme and 554 buildings within 100m from the Proposed Scheme.

2.3.114 Most of these are isolated farmsteads or low density residential housing. A residential area called Whitmore Heath is the largest area of residential properties within or adjacent to the Proposed Scheme.

### **South Cheshire (CA5)**

2.3.115 Access was obtained to approximately 30.9% of the area of land required for the construction of the Proposed Scheme and a 250m buffer from this boundary.

## Woodland

- 2.3.116 There are 96 woodland blocks and clusters scattered throughout, or directly adjacent to, the length of the route in the South Cheshire community area. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 9.5ha of semi-natural broadleaved woodland;
  - 0.4ha of semi-natural mixed woodland;
  - 2.0ha of plantation broadleaved woodland;
  - 0.1ha of semi-natural coniferous woodland; and
  - 0.4ha of plantation mixed woodland.
- 2.3.117 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which is likely to qualify as a lowland mixed deciduous woodland, a habitat of principal importance, and includes the following:
- a block north of Checkley Lane west of Randilow Farmhouse with oak, elder, hawthorn, hazel and birch and the woodland strips surrounding the arable land north of Randilow Farmhouse;
  - scattered woodland blocks north of Den Lane in the Lower Den Farm area to Gonsley Green Farm. Species found include oak, alder, elder, hawthorn, ash, willow, blackthorn and hazel with an understorey of nettle, field rose (*Rosa arvensis*), bramble, broad buckler-fern (*Dryopteris dilatata*), willowherb sp., ragwort (*Jacobaea vulgaris*), Yorkshire fog and bluebell;
  - two small woodland blocks and a woodland strip east of Swill Brook and west of the railway;
  - a block south of Oakleigh Cottage and Newcastle Road; and
  - a woodland block with a pond south of the junction of the A500 and B5071.
- 2.3.118 There are also several areas of semi-natural broadleaved woodland located directly adjacent to the land required for the construction of the Proposed Scheme:
- a small woodland block at Randilow Cottage;
  - two small woodland blocks west of Moss House, with a few cowslips and Lords and Ladies in the ground cover;
  - one woodland block at Coppice Bank and one north-west of Gonsley Green Farm;
  - a block within Wychwood Park Golf Course, dominated by alder, with goat willow, silver birch, oak, hawthorn, rowan and elder;
  - a strip of broadleaved woodland south of Weston Lane at Brook House, near Basford Brook and Mere Gutter LWS;

- a woodland block and strip, along the B500, at Basford;
- three blocks of broadleaved woodland east of the Basford Sidings at the start of Crewe town, crossed by Basford Brook and Mere Gutter LWS; and
- areas of broadleaved woodland along either side of Crewe Interventions line from Crewe to Sandbach.

- 2.3.119 There is no semi-natural mixed woodland within or adjacent to the land required for the construction for the Proposed Scheme.
- 2.3.120 Plantation broadleaved woodland is found in three areas along the WCML within the land required for the construction of the Proposed Scheme west of Chorlton Lane, along the south side of the A500, and along the length of the Basford Sidings, north of the A500.
- 2.3.121 There are also two plantation broadleaved woodland areas directly adjacent to the Proposed Scheme, surrounding Chorlton and east of the Basford Sidings.
- 2.3.122 There is a large mixed plantation woodland block within the land required for the construction of the Proposed Scheme, north of Newcastle Road at Wychwood Park Golf Course that is also within Basford Brook LWS.
- 2.3.123 There are also two areas of mixed plantation woodland directly adjacent to the Proposed Scheme, south of Brook House and along the north side of the A500.
- 2.3.124 There is also one small plantation coniferous woodland at Coppice Bank.

### *Scrub*

- 2.3.125 Both dense/continuous and scattered scrub occurred in random patches within some land parcels, with 7.8ha within land required for the construction of the Proposed Scheme. Scrub is recorded scattered along field edges, surrounding ponds and adjacent to the rail corridor. Species include bramble, common nettle, ramsons and hemlock (*Conium maculatum*).

### *Hedgerows*

- 2.3.126 In total, 21.9km of hedgerow habitat was recorded within the land required for the construction of the Proposed Scheme. This includes:
- 12km of intact species-rich hedgerow;
  - 3.6km of intact species-poor hedgerow;
  - 1.7km of defunct species-poor hedgerow;
  - 1.1km of native species-rich hedgerows with trees; and
  - 3.5km of species-poor hedgerow with trees.
- 2.3.127 Hedgerows that comprise native species qualify as a habitat of principal importance. Typical woody species include pedunculate oak, hawthorn, blackthorn, rose sp., field maple and elder.
- 2.3.128 There are no hedgerows designated as LWS within 250m of the Proposed Scheme.

- 2.3.129 Most of the arable and poor semi-improved fields are bordered by hedgerows. Mature trees are found within these hedgerows including oak, alder, sycamore, willow and ash. Hedgerow species recorded include hawthorn, blackthorn, elder, ivy (*Hedera helix*), rose sp., rowan, field maple and hazel.

*Parkland and scattered trees*

- 2.3.130 Scattered trees present throughout the land required for the construction of the Proposed Scheme include line of trees and small clusters.

*Grassland and marsh*

- 2.3.131 The majority of grassland within the land required for the construction of the Proposed Scheme is improved grassland (82ha), poor semi improved (25ha), neutral semi improved (31ha), amenity grassland (1.5ha) with 0.1ha of acid grassland and 1.3ha of marshy grassland.

- 2.3.132 More varied grasslands include the following:

- areas of semi-improved grassland with adjacent area of marshy grassland south of Newcastle Road. Vegetation is dominated by soft rush, great willowherb, creeping bent and young willow saplings; and
- an area of marshy grassland south-east of Heath Farm.

- 2.3.133 Additional grassland habitat located adjacent to land required for the construction of the Proposed Scheme include:

- a strip of semi-improved grassland west of Back Lane, Basford;
- an area of semi-improved grassland near Heath Farm with bent grasses dominant and Yorkshire Fog and red clover also recorded;
- an area of semi-improved grassland south of Newcastle Road with birds foot trefoil, Yorkshire fog, common bent (*Agrostis capillaris*), knapweed, cranesbill, self heal (*Prunella vulgaris*), oxeye daisy and scabious sp.;
- an area of semi-improved grassland within Wychwood Park Golf Club;
- an area of semi-improved grassland on either side of Checkley Brook south of Checkley Lane;
- an area of semi-improved grassland east of Mere Gutter and west of Common Lane. Species recorded include creeping bent, Yorkshire fog, common bent, timothy, perennial rye grass, ribwort plantain, creeping thistle, germander speedwell (*Veronica chamaedrys*), common ragwort, hogweed, white clover and common nettle;
- a small parcel of semi-improved grassland south of Crewe, west of Crewe Road;
- three small areas of marshy grassland east of Betley Common near Basford Brook and Mere Gutter LWS.
- an area of marshy grassland north of Mill Lane and east of Croatia Mill Farm;

- Midland Meres and Mosses Phase 1 Ramsar<sup>9</sup> / Betley Mere SSSI located 283m north-east from the land required for the construction of the Proposed Scheme includes good quality semi-improved grassland and lowland meadows as part of a habitat mosaic of habitats of principal importance; and
- poor semi-improved grassland parcels north of Crewe Road and south of Gresty Lane comprised of annual meadow-grass (*Poa annua*), meadow foxtail, broadleaved dock, common chickweed (*Stellaria media*), ribwort plantain, creeping buttercup, soft rush, creeping thistle, rosebay willowherb, common mouse-ear, common hogweed, lesser celandine (*Ficaria verna*), wavy bitter-cress (*Cardamine flexuosa*), daisy (*Bellis perennis*) and red-dead nettle (*Lamium purpureum*).

### Watercourses

2.3.134 The main watercourses crossed by the Proposed Scheme are:

- a tributary of River Lea, west of Wrinehill Mill, flowing north-west;
- Checkley Brook, west of Wrinehill Mill and flowing south-west to connect with the River Lea tributary. The aquatic vegetation within the watercourse is limited and is heavily vegetated along the bank margins;
- three small drains, south of Den Lane associated with the quarry and surrounding ponds;
- two unnamed tributaries of Mere Gutter, north west of Coppice Bank and south of Waybutt Lane;
- Swill Brook and an associated drain, north of Gonsley Green Farm with bankside vegetation of Himalayan balsam, reed canary grass, branched bur reed, and soft rush;
- an unnamed watercourse parallel to the west side of WCML and Chorlton Lane;
- Basford Brook where it is adjacent to Newcastle Road; and
- an unnamed watercourses adjacent to the A500, north of Basford.

### Water bodies

2.3.135 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 278. This includes:

- 55 within the area of land required for the construction of the Proposed Scheme;
- 53 between 100m and the area of land required for the construction of the Proposed Scheme;

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<sup>9</sup> Ramsar Convention Secretariat, 2013, *The Ramsar Convention Manual: a guide to the Convention on Wetlands*

- 63 between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- 107 between 250m and 500m from the area of land required for the construction of the Proposed Scheme.

2.3.136 Ponds surveyed are generally within arable fields or semi improved grasslands.

*Arable and cultivated land*

2.3.137 The majority of land in this area is arable fields with 236ha within the land required for the construction of the Proposed Scheme. Field surveys showed large areas of arable farmland bordered by hedgerows and trees within the land required for the construction of the Proposed Scheme.

*Buildings and structures*

2.3.138 There are 83 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.

2.3.139 Buildings present within the land required for the construction of the Proposed Scheme include farm buildings such as barns, outbuildings, sheds and farm houses. Buildings are present in higher densities as the scheme approaches Crewe. These buildings mainly consist of residential and industrial buildings associated with the town.

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