

A12 Chelmsford to A120 widening scheme

TR010060

9.16 Supplementary Botanical Survey Report

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Supplementary Botanical Survey Report

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Acronyms and Abbreviations

BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
DCO	Development Consent Order
DEFRA	Department for Environmental, Food & Rural Affairs
EIA	Environmental Impact Assessment
ES	Environmental Statement
LNR	Local Nature Reserve
LPA	Local Planning Authority
LWS	Local Wildlife Site
MMU	Minimum Mapping Unit
NERC	Natural Environment and Rural Communities Act 2006
NNNPS	National Networks National Policy Statement
NSIP	Nationally Significant Infrastructure Project
SSSI	Site of Special Scientific Interest
UKHab	UK Habitat Classification Assessment

1 Executive Summary

- 1.1.1 This report presents the results of additional botanical and hedgerow surveys along the gas main diversion (Little Braxted to Springfield AIA2, Chapter 2 of the Environmental Statement (ES) [TR010060/APP/6.1]) undertaken in 2022, on land not covered by the original suite of surveys reported in Appendix 9.8 of the ES. It presents an evaluation of present botanical flora and hedgerows based on recent surveys. It also presents the policy and legislative context within which the environmental impact assessment has been carried out. Likely significant effects on, and mitigation for botanical flora and hedgerows are considered in Chapter 9 of the ES.
- 1.1.2 Habitats were categorised using best practice guidance (UK Habitat Classification Working Group, 2018) on 20 July 2022. All habitats were classified to at least Level 3 in the UK Habitats Classification (UKHab) primary habitat classification hierarchy. Categories of secondary habitat code were used to record additional habitat attributes.
- 1.1.3 The survey found seven primary UK Habitat types within the site including: f2d aquatic marginal vegetation, f2f other swamp, g3c other neutral grassland, w1d wet woodland, w1g7 other broadleaved woodland types, w1g6 line of trees, and u1e built linear features. Wet woodland is a UK Biodiversity Action Plan (BAP) priority habitat.
- 1.1.4 The condition assessment for all six suitable UK Habitat types found each habitat to be of 'moderate' condition (f2d, f2f, g3c, w1d, w1g7 and w1g6).
- 1.1.5 Of particular significance was a female black poplar (*Populus nigra*) in the north-west of the site. In addition, mature oaks are present along the eastern boundary of the survey area.
- 1.1.6 There were two hedgerows identified within the survey area, both qualifying as Hedgerows priority habitat, i.e. hedgerows comprised at least 80% native species, but that were not important or ancient / irreplaceable hedgerows. In accordance with DMRB LA 108 these are assessed as being of National importance for biodiversity.
- 1.1.7 National Highways is working with the owner of the gas main to develop the design and construction methodology for the gas main diversion which could impact this part of the proposed scheme. Where practicable impacts will be avoided or otherwise mitigated.

2 Introduction

2.1 Background

- 2.1.1 The A12 Chelmsford to A120 Widening Scheme (the 'proposed scheme') comprises improvements to the A12 between junction 19 (Boreham) at TL 741094, and junction 25 (Marks Tey) at TL 917238, a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout. It also includes safety improvements, including closing of existing at grade accesses, and reducing access to cyclists along the dual carriageway by providing an alternative route for walkers, cyclists and horse riders.
- 2.1.2 The proposed scheme would require new crossings of watercourses and potential improvements to existing culvert and bridge crossings. There are eight crossings of main rivers, six of which comprise existing crossings and two of which comprise new crossings on proposed offline sections of road. Three of the crossings would require minor realignments at the crossing points.
- 2.1.3 There are various gas mains that would be affected by the proposed scheme and would therefore need to be diverted from their existing location to avoid clashes with the proposed scheme. The asset referred to as Little Braxted to Springfield – A1A2 is of particular importance due to the extent of the diversion required (this is referred to as 'the gas main diversion' through the ES. The works to widen the A12 as part of the proposed scheme would cause two principal pinch-points that would require diversion of the existing gas main into a new corridor. The two pinch-points are:
- a. where the gas main passes between the A12 and existing housing and church by Maldon Road
 - b. where the gas main passes between the A12 and Whetmead Local Nature Reserve (LNR).
- 2.1.4 The proposed scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act (2008), triggering the need to apply for a Development Consent Order (DCO). A DCO application was submitted to the Planning Inspectorate (PINS) by National Highways in August 2022 and was accepted by the Planning Inspectorate on 12 September 2022. The application was supported by an Environmental Statement (ES) which included numerous appendices. Appendix 9.8 (Phase 1 Habitat Report) of the ES summarised the baseline data collected with respect to habitat assessment.
- 2.1.5 Due to the iterative nature of the design process in the lead up to DCO submission there were changes in the Order Limits. Some of the changes occurred subsequent to the end of the optimal survey season and therefore a small number of surveys could not be completed prior to the DCO submission.

2.2 Purpose of the report

- 2.2.1 This report presents the results of these additional botanical and hedgerow surveys of the gas main diversion (Little Braxted to Springfield A1A2, Chapter 2 of the ES [TR010060/APP/6.1]) undertaken in 2022, on areas of land not covered by the original suite of surveys reported in Appendix 9.8 of the ES. Likely significant effects on, and mitigation for protected and notable plants and habitats are considered in Chapter 9 of the ES, and this report concludes whether the results of the surveys affect the results of that assessment. It presents the policy and legislative context within which the environmental impact assessment (EIA) has been carried out.

2.3 Survey Objectives

- 2.3.1 The key objectives of the botanical survey were to:
- a. Identify and map the habitats present within the survey area (shown in Appendix A) using the methodology set out in UK Habitat Classification assessment (UK Habitat Classification Working Group, 2018).
 - b. Undertake a condition assessment of all habitats recorded within the survey area (Natural England, 2022).
 - c. Record any notable plant species present within the survey area.
- 2.3.2 The key objectives of the hedgerow survey were to:
- a. survey all hedgerows within the Order Limits of the gas main diversion following good practice survey methodology.
 - b. collect information to identify hedgerows qualifying as priority habitat.
 - c. collect information to identify species-rich hedgerows.
 - d. collect information to undertake an assessment of hedgerows against the wildlife and landscape criteria in Schedule 1 of the Hedgerows Regulations 1997.

3 Legislation and policy

- 3.1.1 The provisions of international legislation, incorporated into UK law and relevant to the assessment, are identified in Sections 3.2 – 3.7.

3.2 Conservation of Habitats and Species Regulations 2017

- 3.2.1 Articles 1 and 2 of the Habitats Directive require that the UK maintains at favourable conservation status the habitats and species listed in the Annexes to the Directive. Annex I of the Directive lists 78 habitats occurring in the UK (hereafter, Annex I Habitats), and Annex II lists four bryophyte and nine vascular plant species occurring in the UK (JNCC, 2014). Twenty-three of the Annex I Habitats are a priority for conservation within the European Union (hereafter, priority Annex I Habitats).
- 3.2.2 The main way in which the UK implements the requirements of the Habitats Directive to conserve the listed species and habitats is by the designation of sites supporting Annex I habitats or populations of Annex II species of community importance as Special Areas of Conservation (SAC). These sites contribute to the EU-wide network of sites known as the Natura 2000 network.

3.3 Wildlife and Countryside Act 1981

- 3.3.1 Wild plants are protected in domestic legislation under the Wildlife and Countryside Act 1981 (as amended). Section 13 of the Act makes it an offence if any person:
- intentionally picks, uproots or destroys any wild plant included in Schedule 8 of the Act;
 - not being an authorised person, intentionally uproots any wild plant not included in Schedule 8;
 - sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant; or
 - publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things.
- 3.3.2 Schedule 8 of the Act lists five fungi, 30 lichens, two stoneworts, 37 bryophytes and 113 vascular plants which are afforded special protection the special protection described in items a. and c. above.
- 3.3.3 In addition to protection of wild plants, Section 14(2) of the Act makes it an offence to plant or otherwise cause to grow in the wild any plant which is included in Part II of Schedule 9 of the Act. The Schedule is a list of invasive non-native species, comprising 12 algae and 42 vascular plants.

3.4 The Invasive Alien Species (Enforcement and Permitting) Order 2019

- 3.4.1 The Invasive Alien Species (Enforcement and Permitting) Order 2019 makes it an offence to plant or otherwise cause to grow in the wild any plant species listed on Schedule 2 of the Order and requires due diligence to be exercised to avoid committing such an offence. The Order provides for the licensing of certain activities with respect to the controlled species, such as eradication or management. Schedule 2 lists nine plant species, all of which are also listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

3.5 Priority Habitats

- 3.5.1 The Natural Environment and Rural Communities Act 2006 (NERC) ties together wildlife legislation and planning policies. Section 40 of the Act places a duty on government and statutory bodies in England, such as National Highways, to consider the conservation of biodiversity when carrying out their normal functions.
- 3.5.2 Section 41 of the NERC requires the Secretary of State to publish a list of species and habitats that are of principal importance for the conservation of biodiversity in England (hereafter referred to as 'priority species and habitats'), and to promote the conservation of these species and habitats. The list is published by Natural England and comprises 943 species and 56 terrestrial, freshwater, coastal and marine habitats.
- 3.5.3 The list of priority habitats includes the hedgerows priority habitat. This habitat is defined as any hedgerow where at least 80% of the woody vegetation comprises native species (BRIG, 2011)

3.6 National Policy Statement for National Networks

- 3.6.1 The National Networks National Policy Statement (NNNPS) sets out the Government's policies to deliver the development of NSIP on the national road and rail networks in England. The Secretary of State uses the NNNPS as the primary basis for making decisions on DCO applications.
- 3.6.2 Paragraph 5.22 of the NNNPS states that the applicant's assessment should describe any likely significant effects on internationally, nationally and locally designated sites of ecological conservation importance; protected species; habitats (including irreplaceable habitats such as ancient woodland and veteran trees); and other species identified as being of principal importance for the conservation of biodiversity. The surveys described in this report will inform the assessment of significant effects within the ES.
- 3.6.3 In addition to the national policy set out in the NNNPS, the proposed scheme must also have regard to relevant legislation and local plans and policy.

3.7 National Planning Policy Framework

- 3.7.1 The National Planning Policy Framework (NPPF) 2019 sets out the government's economic, environmental and social planning policies. It provides the Government's view on how planners should balance nature

conservation with development and helps ensure that Government meets its biodiversity commitments. The framework focuses on planning for prosperity, people and places, promoting increased levels of development and supporting infrastructure, whilst also protecting and enhancing the natural and historic environment. It also has core principles that include the need to “proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth”.

- 3.7.2 Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.

3.8 Hedgerows Regulations (1997)

- 3.8.1 The Hedgerows Regulations (1997) provides protection of certain hedgerows as described within the regulations. Any part of these hedgerows may not be removed until permission is granted. An application to remove a hedgerow must be made to the Local Planning Authority (LPA), who will either issue a hedgerow retention or removal notice.
- 3.8.2 As per Section 6(1)(e) of the regulations, ‘the removal of any hedgerow to which these Regulations apply is permitted if it is required for carrying out development for which planning permission has been granted or is deemed to have been granted’. Consent to remove hedgerows would be authorised through consent of the Development Consent Order (DCO) application, not through an application to the LPA.
- 3.8.3 A hedgerow is protected if it:
- a. has a continuous length of, or exceeds, 20m (with gaps of 20m or less within the hedgerow)
 - b. has a continuous length of less than 20m, but meets another hedge at each end
 - c. a countryside hedgerow
- 3.8.4 A countryside hedgerow is defined as any hedgerow that is not within, or does not mark the boundary of, a dwelling place or private garden, and is on or next to (Defra, 2019);
- a. land used for agriculture or forestry
 - b. land used for breeding or keeping horses, ponies or donkeys
 - c. common land

- d. a village green
 - e. a Site of Special Scientific Interest (SSSI)
 - f. a protected European site such as a Special Area of Conservation (SAC) or Special Protection Area (SPA)
 - g. a local or national nature reserve
 - h. land belonging to the state.
- 3.8.5 A hedgerow is deemed 'important' if it:
- a. has existed for a least 30 years
 - b. satisfies at least one of the criteria listed in the archaeological and history, or wildlife and landscape criteria in Part II of Schedule 1 of the Regulations.

4 Methodology

4.1 Desk Study

- 4.1.1 A desk study was undertaken in 2020 to obtain information pertaining to botanical species and hedgerows in the study area and surrounding landscape. The desk study provided sufficient coverage of the gas main diversion.
- 4.1.2 The methodology and the results of the desk study are presented in detail in Appendix 9.7 Hedgerow Survey Report [TR010060/APP/6.3] and Appendix 9.8 Phase 1 Survey Report [TR010060/APP/6.3].

4.2 Field Survey

UK Habitats Classification Surveys

- 4.2.1 UK Habitats Classification (UKHab) surveys were undertaken for an area of land which had not been accessed previously. The survey area was determined by the extent of landownership which overlapped with land within the Order Limits in the vicinity of the gas main diversion to the south of Whetmead Local Nature Reserve (LNR) and Local Wildlife Site (LWS) as shown in Appendix A.
- 4.2.2 Surveys were led by an ecologist experienced in UKHab surveys and botanical identification. Surveyors mapped and classified all habitats within the survey area, following the UKHab survey methodology (UK Habitat Classification Working Group, 2018). Target notes were used to map notable ecological features recorded during the survey visit and their locations are shown on the figure in Appendix A. DAFOR scores, target notes and supporting photographs are provided in Appendix B, C and D respectively.
- 4.2.3 The fine scale mapping methodology recommended in UKHab was followed:
- features smaller than the Minimum Mapping Unit (MMU) of 25m² were mapped as points;
 - linear features less than 1m wide were mapped as lines; and
 - linear features more than 1m wide or non-linear features with an area greater than the MMU were mapped as polygons.
- 4.2.4 All habitats were classified to at least Level 3 in the UKHab primary habitat classification hierarchy. Secondary habitat codes were used to record additional habitat attributes.
- 4.2.5 The level of additional information recorded about the habitats was determined based on professional judgement of the ecological value of habitats, with the following recorded as required:
- date of survey;

- b. notes;
 - c. photographs;
 - d. lists of vascular plants; and
 - e. condition assessment.
- 4.2.6 Notes included information such as habitat structure and management and any change in habitat from previous survey was recorded. Lists of vascular plants were recorded from within each of the canopy, shrub and field layers of the vegetation, with the abundance of each taxon in each layer given a qualitative score of abundance using the DAFOR system, i.e. 'dominant', 'abundant', 'frequent', 'occasional', 'rare', 'locally dominant', 'locally abundant' or 'locally frequent'. The nomenclature for vascular plants followed Stace (2019).
- 4.2.7 Condition assessment was undertaken for all habitat features mapped, following the Defra Biodiversity Metric 3.1 (Natural England, 2022). For each habitat feature assessed, the date of assessment and condition were recorded. Condition was recorded as 'good', 'moderate', 'poor' and 'N/A', assessed using the condition assessment form appropriate to the habitat. The assessment was recorded as free text, referring to the main condition assessment criteria.

Hedgerow Surveys

- 4.2.8 The aim of the field survey was to assess the hedgerows along the gas main diversion following the methodology outlined in the Hedgerow Survey Handbook (Defra, 2007).
- 4.2.9 The field survey was carried out on 6 September 2022 by suitably qualified, competent, and experienced ecologists.
- 4.2.10 For each feature surveyed, an in-field assessment was undertaken of whether:
- a. the feature was a hedgerow
 - b. the feature was a countryside hedgerow
 - c. the woody vegetation was likely to be at least 30 years old
- 4.2.11 The assessment of age was based on professional judgement, using field evidence such as signs of planting, location and age of trees and shrubs.
- 4.2.12 The following hedgerows were surveyed in detail, following the Hedgerow Survey Handbook (Defra, 2007):
- a. hedgerows that were not countryside hedgerows but were considered likely to be old features, possibly predating the residential property
 - b. hedgerows considered to be less than 30 years old but have been assessed as a priority habitat
 - c. countryside hedgerows considered to be at least 30 years old
- 4.2.13 For such hedgerows the following details were recorded:

- a. a standard list of attributes, including survey metadata and attributes from the survey form in the Hedgerow Survey Handbook (Defra, 2007)
 - b. photographs representing key features of the hedgerow, such as vegetation structure and trees
 - c. lists of target vascular plant taxa (defined in 3.2.16) from the hedgerow and each 30m sample section (defined in 3.2.15)
- 4.2.14 For other features surveyed, survey metadata, a description of the feature, and photographs were recorded.
- 4.2.15 The 30m sample sections were defined as:
- a. where the length of the hedgerow did not exceed 30m, the whole hedgerow
 - b. where the length of the hedgerow exceeded 30m but not 100m, the central 30m of the hedgerow
 - c. where the length of the hedgerow exceeded 100m but not 200m, the central 30m within each half of the hedgerow
 - d. where the length of the hedgerow exceeded 200 metres, the central 30m within each third of the hedgerows
- 4.2.16 Target vascular plants were defined as:
- a. woodland herbs – herbaceous woodland field layer species, such as those listed on Schedule 3 of the Hedgerows Regulations (1997), and ancient woodland indicator species in Essex (Rose and O'Reilly, 2006)
 - b. brambles – dewberry *Rubus caesius* and members of *the Rubus fruticosus* aggregate
 - c. climbers – all woody and herbaceous climbing plants, including mistletoe *Viscum album* but excluding brambles and roses
 - d. trees/shrubs – woody species, including roses and excluding brambles and woody climbers
- 4.2.17 For each vascular plant taxon recorded, and for the whole hedgerow and each sample section, the relative abundance within the woody or herbaceous layers of the vegetation was recorded. A qualitative score of 'dominant', 'abundant', 'frequent', 'occasional' or 'rare' was used, corresponding to approximately 50- 100%, 30-50%, 15-30%, 5-15% and less than 5% total cover, respectively. Taxa were recorded as 'present' or 'absent' from each 30m sample section. Where further context was required, notes were collected with the records.
- 4.2.18 The survey was carried out using the Collector for ArcGIS application on an iPad. A map with a layer representing the digitised hedgerows was used to record the hedgerow attributes and photographs. The lengths of hedgerow for sampling were located using a layer showing the pre-digitised sample sections and the Global Positioning System (GPS) built into the iPad (horizontal accuracy approximately 5m). Lists of vascular plants were recorded in a table related to the hedgerow layer.

- 4.2.19 The database of hedgerow features digitised from the desk study were edited in the field where:
- the hedgerow represented was longer or shorter than the digitised feature, or where the hedgerow was in the wrong location
 - a feature represented more than one hedgerow (eg. there was a gap longer than 20m)
 - a hedgerow was identified in the field that had not been identified during the desk study
- 4.2.20 The nomenclature for recording vascular plants generally followed Stace (2019). Nomenclature for brambles followed Edees and Newton (1988). Some non-native taxa listed in Sell and Murrell (1997-2018), such as in the genera *Acer* and *Euonymus*, were recorded.
- 4.2.21 Condition assessment was undertaken for the hedgerows following the Defra Biodiversity Metric 3.1 (Natural England, 2022). For each habitat feature assessed, the date of assessment and condition were recorded. Condition was recorded as 'good', 'moderate', 'poor' and 'N/A', assessed using the condition assessment form appropriate to the habitat. The assessment was recorded as free text, referring to the main condition assessment criteria.

4.3 Limitations

UK Habitats Classification Surveys

- 4.3.1 The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document.
- 4.3.2 This report should be read in full, and excerpts may not be representative of the findings.
- 4.3.3 This report has been prepared exclusively for Jacobs' client and no liability is accepted for any use or reliance on the report by third parties.
- 4.3.4 Some of the habitat encountered was difficult to assess due to dense vegetation and some areas being inundated with water. This was particularly prevalent in the wet woodland and swamp habitats. However, this did not significantly affect the ability to assess accurately the habitats present within the survey area as all areas were assessed to at least a Level 3 UK Habitat code.
- 4.3.5 The survey was conducted in summer, which is an appropriate time of year to conduct botanical surveys. However, some vernal species are detectable only in spring so the species detected during the survey may not be definitive.

Hedgerow Surveys

- 4.3.6 The survey was carried out towards the end of the recommended hedgerow survey period which is between April and October (Defra, 2007). The

surveys followed a period of hot and dry weather during the spring and summer seasons. Some early-flowering woodland herbs may have therefore been present in the hedgerows but were not identified during the surveys. It is possible that these herbs may have completed their life cycle earlier than normal due to the weather conditions. This may limit the Hedgerows Regulations assessment where information about woodland herbs is required.

5 Results

5.1 Desk study

- 5.1.1 The results of the desk study for hedgerows and botanical species for the proposed scheme are presented in Appendix 9.7 Hedgerow Survey Report and Appendix 9.8 Phase 1 Survey Report respectively.

5.2 Field Study

UK Habitats Classification Surveys

- 5.2.1 The UKHab habitat types identified during the 2022 survey are listed in Table 1. The location of these habitats and species table is shown in Appendix A, with DAFOR scores presented in Appendix B. Photographs and Target Notes (TN) taken during the survey are provided in Appendix C and D.

Table 1 UK Habitats assessment with species and DAFOR scales

Habitat Type	Condition	Description
Primary: f2f other swamp Secondary: 11 scattered trees, 16 tall herb,	Moderate	F2f swamp habitat with scattered crack willow (<i>Salix fragilis</i>) trees to the south of the survey area, dominated by nettles with frequent recordings of greater pond sedge (<i>Carex riparia</i>), purple loosestrife (<i>Lythrum salicaria</i>), great willowherb (<i>Epilobium hirsutum</i>) and bindweed (<i>Calystegia sepium</i>) throughout. The habitat has a wet ditch nearby to the south which transitions into a reedbed populated by common reed (<i>Phragmites australis</i>). Rare occurrences of forbs such as curly dock (<i>Rumex crispus</i>) and hedge bindweed (<i>Calystegia sepium</i>) around the habitat edges adjacent to the g3c (other neutral grassland) habitat which borders to the east and west of the parcel.
Primary: f2d aquatic marginal vegetation Secondary: 11 scattered trees, 16 tall herb,	Moderate	Riparian edge vegetation with scattered Scot's pine (<i>Pinus sylvestris</i>) and crack willow along the length of the River Blackwater within the western edge of the survey area. Dominant common nettle (<i>Urtica dioica</i>) forms the majority of the herbaceous vegetative diversity within this habitat with occasional wild angelica (<i>Angelica sylvestris</i>), purple loosestrife and great willowherb along the length of the edge of the pathway and riparian habitat. Lone standing female black poplar present in north-western corner with potential otter holt (TN6).
Primary: w1d wet woodland	Moderate	Open wet woodland habitat to the south of the survey area with frequent crack willow trees. Majority of the lower vegetation includes frequent common nettle with

Habitat Type	Condition	Description
Secondary: 16 tall herb,		scattered shrubs of dogwood (<i>Cornus sanguinea</i>) and lone standing swamp cypress (<i>Taxodium disticum</i>), silver birch (<i>Betula pendula</i>) and willows (<i>Salix</i> spp.). Edge herbaceous habitat vegetation is diverse along the eastern and western borders of the habitat including occasional water mint (<i>Mentha aquatica</i>), wild angelica, great willowherb and comfrey (<i>Symphytum officinale</i>) with seven other ground flora herbaceous species occurring rarely within the habitat edge vegetation.
Primary: w1g7 other broadleaved woodland types	Moderate	Species diverse planted woodland to the northern section of the survey area with several older oak (<i>Quercus robur</i>). Planted species include field maple (<i>Acer campestre</i>), cherry (<i>Prunus avium</i>), alder (<i>Alnus glutinosa</i>), spindle (<i>Euonymus europaeus</i>), hornbeam (<i>Carpinus betulus</i>) and hazel (<i>Corylus avellana</i>). Limited ground vegetation of ground ivy (<i>Glechoma hederacea</i>) and common nettle due to shading from dense canopy from mature trees. Frequent rabbit warrens (TN2 and TN3) along the eastern border of the habitat with a log pile (TN4) within the northern border.
Primary: w1g6 line of trees	Moderate	W1g6 line of dominant mature oak trees (approximately 350/400 years old) with occasional scattered mature ash (<i>Fraxinus excelsior</i>) and alder trees along a continuous fence line throughout the eastern boundary of the survey area.
Primary: g3c other neutral grassland Secondary: 11 scattered trees, 160 sward type mosaic	Moderate	Neutral grassland habitat which forms the pathway and adjacent vegetation to the east of the survey area. Vegetation along the length of the pathway includes trample tolerant herbaceous and grass species such as annual meadow grass (<i>Poa annua</i>), self-heal (<i>Prunella vulgaris</i>) and creeping buttercup (<i>Ranunculus repens</i>). Herbaceous vegetation between the woodland habitats along the western border of the grassland habitat includes water figwort (<i>Scrophularia auriculata</i>), common nettle and common comfrey. Various rabbit burrows (TN1) and log piles (TN5) also present along edges of pathway.
Primary: g3c other neutral grassland	Moderate	Neutral grassland habitat which forms the western pathway and adjacent vegetation to the west of the survey area. Composition of vegetation throughout the habitat includes common grass and herbaceous species such as annual meadow grass, creeping buttercup, self-heal and ground ivy. Similar composition to eastern section of g3c habitat of larger herbaceous species

Habitat Type	Condition	Description
		including common nettle, creeping thistle (<i>Cirsium arvense</i>) and common comfrey.
Primary: u1e built linear features	N/A	Fence line which spans the length of the eastern boundary of the survey area along w1g6 line of trees.

Hedgerow Surveys

- 5.2.2 Two countryside hedgerows were identified during the 2022 survey, both of which were classified as priority habitat because at least 80% of the woody vegetation comprised native species. Neither hedgerow was classified as an important or ancient / irreplaceable hedgerow. Hedgerow 001 was of a similar diameter throughout and less than 30 years old suggesting the hedgerow was recently planted. Although hedgerow 002 has existed for at least 30 years, it did not meet the criteria to be classified as an important or ancient / irreplaceable hedgerow.
- 5.2.3 A summary of hedgerows can be found in Table 2 and their location shown in Appendix A. Photographs of the hedgerows are provided in Appendix D.

Table 2 Hedgerow survey results

Hedgerow ID	Grid reference	Condition	Description
001	TL 83343 14165	Moderate	Species-poor hedgerow with no gaps. Section 1 was dominated by common hawthorn (<i>Crataegus monogyna</i>) with abundant blackthorn (<i>Prunus spinosa</i>). Section 2 had abundant blackthorn and hawthorn, with white bryony (rare) (<i>Bryonia dioica</i>) and dog rose (occasional) (<i>Rosa canina</i>). A ditch runs alongside the hedgerow, and three semi-mature English oak (<i>Quercus robur</i>) trees are present.
002	TL 83376 13766	Moderate	Species-poor hedgerow dominated by blackthorn. Other species present included occasional common hawthorn and field maple, and rare elder (<i>Sambucus nigra</i>). Nettle, burdock, and thistle in abundance, indicating area is likely nutrient enriched. A ditch runs alongside the hedgerow.

6 Discussion

6.1 Summary

- 6.1.1 From the results of the botanical survey seven habitats were identified to Level 3 UK Habitat codes. All habitats were classified as moderate condition.
- 6.1.2 One UK BAP Priority Habitat, wet woodland, was identified during the survey. This habitat is infrequent within the UK with an estimated 50,000 – 70,000 hectares remaining in the UK (DEFRA, 2008). The habitat is typically composed of birch, alder and willow species within a variety of soil types and levels of soil water saturation with abundant deadwood habitat.
- 6.1.3 At the time of the survey no notable botanical species were identified. Nettle was dominant within the w1d wet woodland and f2f swamp habitat in the centre of the survey area especially.
- 6.1.4 A female black poplar was identified within the survey area, and it is understood from a consultation response from Essex Wildlife Trust a second female black poplar is located to the south (outside the survey area and Order Limits).
- 6.1.5 Two countryside hedgerows were identified within the survey area, both of which qualify as priority habitat but that are not important or ancient / irreplaceable hedgerows. As priority habitat, in accordance with DMRB LA 108, these hedgerows are assessed as being of National importance for biodiversity.
- 6.1.6 National Highways is working with the owner of the gas main to develop the design and construction methodology for the gas main diversion which could impact this part of the proposed scheme. Where practicable, impacts on ecologically sensitive features will be avoided, or otherwise mitigated.

7 References

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Appendix A. Figures

Figure 1 – UK Habitat Classification

Figure 2 – Hedgerow location plan

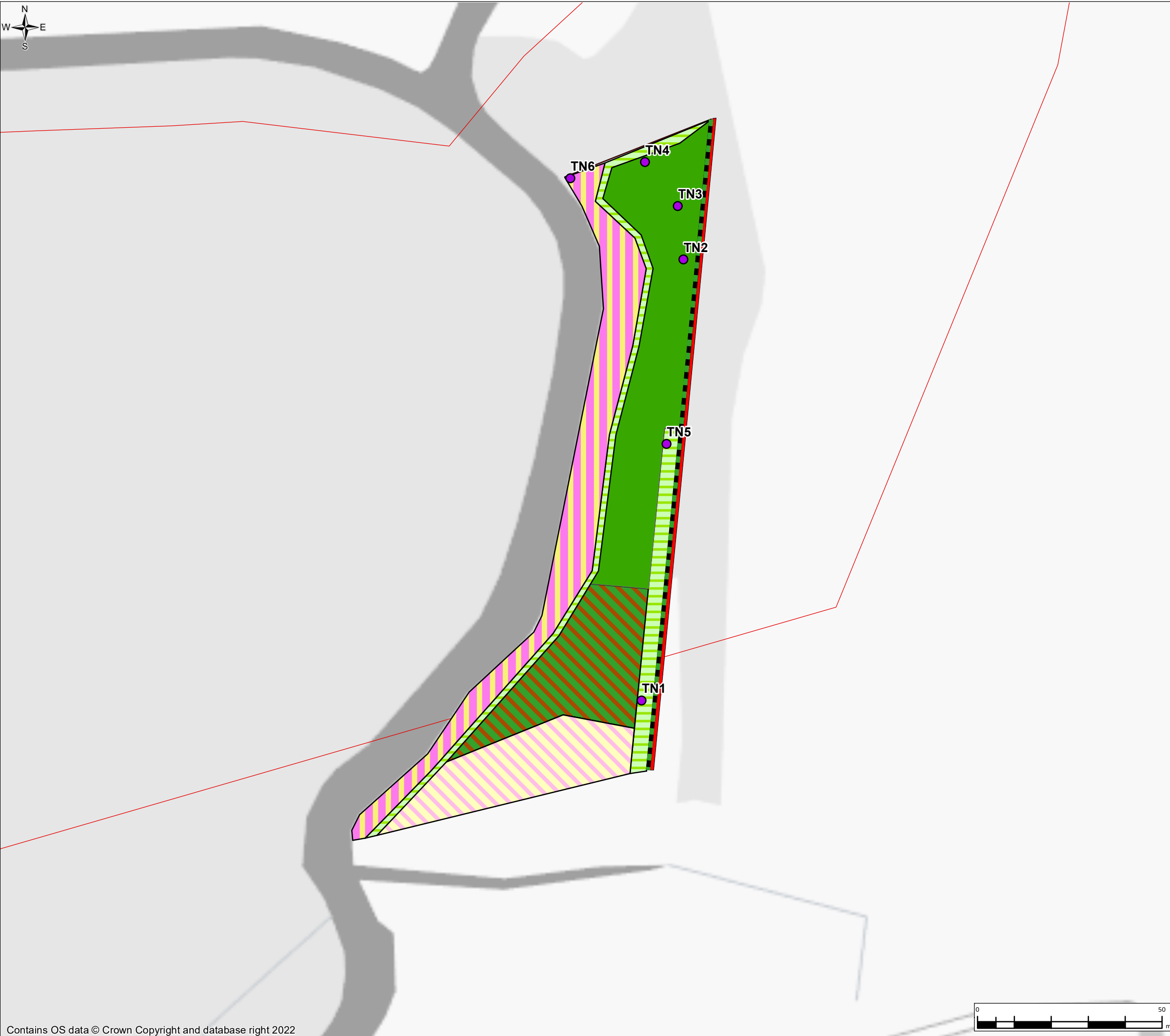
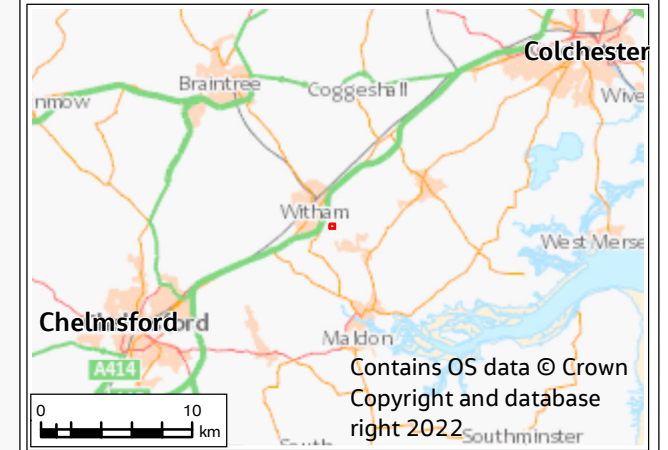


FIGURE 1

Legend

- Order Limits
- Habitat type (UK Hab)**
- w1g6 - Line of trees
- f2d - Aquatic marginal vegetation
- f2f - Other swamp with scattered trees
- g3c - Other neutral grassland
- u1e - Built linear features
- w1d - Wet woodland
- w1g7 - Other broadleaved woodland types



P1.0	20/01/2023	FINAL	JC	KL	AJ	SL
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd



Project
**REGIONAL DELIVERY PARTNERSHIP
 A12 CHELMSFORD TO A120 WIDENING SCHEME**

Drawing Title
**BOTANICAL SURVEY REPORT – UK HABITAT
 CLASSIFICATION**

Drawing Status
S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:1000	DO NOT SCALE
Jacobs No.	B36601D4	
Client No.	HE551497	Rev P1.0

Drawing Number
HE55 1497-JAC-EBD-5_SCHME-SK-LE-0008

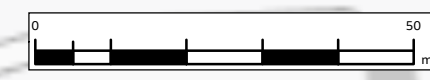
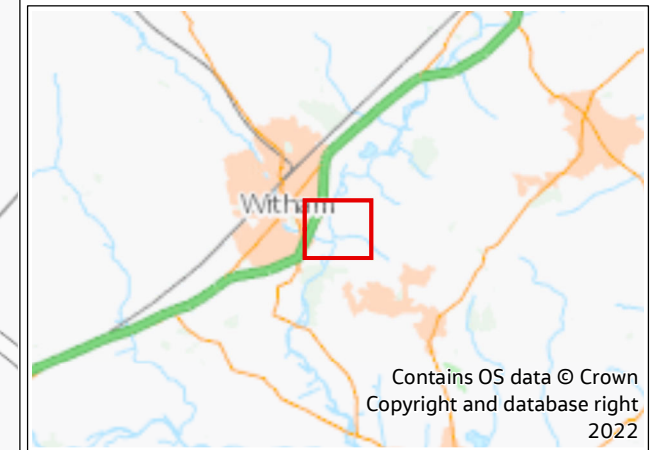
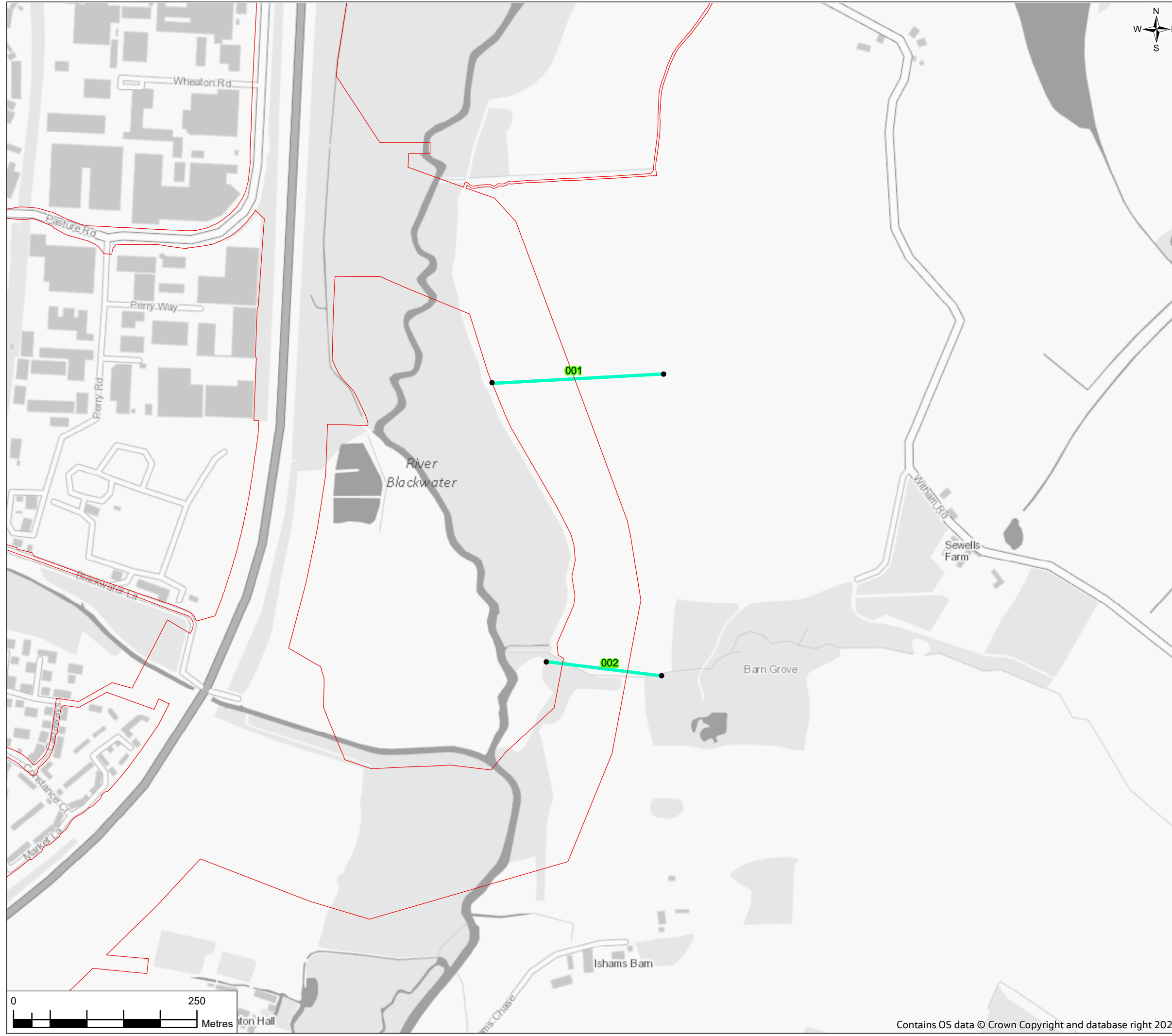


FIGURE 2



Legend

- Order Limits
- Hedgerows**
- Not important - species poor
- Hedgerow end points
- Priority Habitat**
- Priority



P01	10/02/23	Initial issue	JC	LW	NP	SG
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Client

Project

**REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME**

Drawing Title

**SUPPLEMENTARY BOTANICAL SURVEY REPORT
HEDGEROW LOCATION PLAN
SHEET 1 OF 1**

Drawing Status **S3 - SUITABLE FOR COMMENTS AND REVIEW**

Scale @ A3	1:5000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number **HE551497-JAC-EBD-5_SCHME-SK-LE-0008**

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Appendix B. UK Habs Survey DAFOR table


Common name	Species name	f2f	f2d	w1d	w1g7	w1g6	g3c (east)	g3c (west)
Field maple	<i>Acer campestre</i>	-	-	-	F	-	-	-
Alder	<i>Alnus glutinosa</i>	R	-	-	R	R	-	-
Wild angelica	<i>Angelica sylvestris</i>	O	O	O	-	-	-	-
Greater burdock	<i>Arctium lappa</i>	O	-	-	-	-	-	-
Silver Birch	<i>Betula pendula</i>	R	-	R	-	-	-	-
Hedge bindweed	<i>Calystegia sepium</i>	F	-	F	-	-	-	-
Pendulous sedge	<i>Carex pendula</i>	O	-	-	-	-	-	-
Greater pond sedge	<i>Carex riparia</i>	F	-	-	-	-	-	-
Hornbeam	<i>Carpinus betulus</i>	-	-	-	R	-	-	-
Creeping thistle	<i>Cirsium arvense</i>	-	-	R	-	-	R	R
Spear thistle	<i>Cirsium vulgare</i>	-	-	R	-	-	R	R
Dogwood	<i>Cornus sanguinea</i>	-	-	R	-	-	-	-
Hazel	<i>Corylus avellana</i>	-	-	-	A	-	-	-
Common teasel	<i>Dipsacus fullonum</i>	R	-	R	-	-	-	-
Great willowherb	<i>Epilobium hirsutum</i>	F	O	O	-	-	-	-
Spindle	<i>Euonymus europaeus</i>	-	-	-	R	-	-	-
Ash	<i>Fraxinus excelsior</i>	-	-	-	R	R	-	-
Cleavers	<i>Galium aparine</i>	R	-	-	-	-	-	-
Ground ivy	<i>Glechoma hederacea</i>	R	-	-	O	-	O	O
Hogweed	<i>Heracleum sphondylium</i>	-	-	R	-	-	-	-

Common name	Species name	f2f	f2d	w1d	w1g7	w1g6	g3c (east)	g3c (west)
Holly	<i>Ilex aquifolium</i>	-	-	-	R	-	-	-
Purple loosestrife	<i>Lythrum salicaria</i>	O	O	-	-	-	-	-
Water mint	<i>Mentha aquatica</i>	-	-	O	-	-	-	-
Common reed	<i>Phragmites australis</i>	R	-	-	-	-	-	-
Scot's pine	<i>Pinus sylvestris</i>	-	R	-	-	-	-	-
Annual meadow grass	<i>Poa annua</i>	-	-	-	-	-	A	A
Self-heal	<i>Prunella vulgaris</i>	-	-	-	-	-	O	O
Cherry	<i>Prunus avium</i>	-	-	-	O	-	-	-
Pedunculate oak	<i>Quercus robur</i>	-	-	-	O	D	-	-
Creeping buttercup	<i>Ranunculus repens</i>	-	-	R	-	-	O	O
Curly dock	<i>Rumex crispus</i>	R	-	R	-	-	-	-
Willow species	<i>Salix sps.</i>	-	-	O	O	-	-	-
Crack willow	<i>Salix x fragilis</i>	R	R	F	-	-	-	-
Water figwort	<i>Scrophularia auriculata</i>	-	-	-	-	-	R	R
Common comfrey	<i>Symphytum officinale</i>	-	-	O	-	-	O	O
Swamp cypress	<i>Taxodium disticum</i>	-	-	R	-	-	-	-
Common lime	<i>Tilia x europaea</i>	-	-	-	R	-	-	-
Common nettle	<i>Urtica dioica</i>	D	D	A	F	-	O	O

Appendix C. Target notes


Target Note	Description	Photograph numbers
TN1	Log piles present on south-eastern border of the survey area along pathway	1 – 4
TN2	Rabbit warren along eastern side of the survey area	5
TN3	Rabbit warren next to fence line	6
TN4	Log and brash pile to north of survey area	7
TN5	Rabbit burrow on eastern border of survey area	8
TN6	Female native black poplar and potential otter holt	9


Appendix D. Photographs


Description	Photographs
UK Habitats Classification Survey	
<p>Photograph 1: Example of log piles (TN1).</p>	


Description	Photographs
<p>Photograph 2: Rabbit warren 1 (TN2).</p>	


Description	Photographs
<p>Photograph 3: Rabbit warren 2 (TN3).</p>	

Description	Photographs
<p>Photograph 4: Log and brush pile (TN4).</p>	

Description	Photographs
<p>Photograph 5: Rabbit burrow 1 (TN5).</p>	

Description	Photographs
<p>Photograph 6: Female native black poplar with potential otter holt (TN6).</p>	

Description	Photographs
<p>Photograph 7: f2f other swamp.</p>	


Description	Photographs
<p>Photograph 8: f2f other swamp, scattered trees and shrubs, reedbeds visible outside the survey area.</p>	

Description	Photographs
<p>Photograph 9: f2f other swamp – common reed along ditch.</p>	

Description	Photographs
<p>Photograph 10: f2d aquatic marginal vegetation to the right, g3c grassland (western pathway) and f2f swamp edge habitat.</p>	

Description	Photographs
<p>Photograph 11: f2d aquatic marginal vegetation – lone standing Scot's pine.</p>	 A photograph showing a lone standing Scot's pine tree in a field of aquatic marginal vegetation. The tree is tall and slender with a reddish-brown trunk and dense green needles. It stands in a field of lush green plants, likely watercress, which are growing in a shallow, muddy area. The background shows more trees and a clear blue sky.


Description	Photographs
<p>Photograph 12: f2d aquatic marginal vegetation with mature crack willow, common nettle dominant.</p>	


Description	Photographs
<p>Photograph 13: f2d aquatic marginal vegetation, black poplar in north-west of site.</p>	

Description	Photographs
<p>Photograph 14: f2d aquatic marginal vegetation – mature crack willow, view of River Blackwater and western pathway</p>	


Photograph 15: f2d
aquatic marginal
vegetation – mature crack
willow, view of River
Blackwater and western
pathway



Description	Photographs
Photograph 16: w1d wet woodland	 A photograph of a wet woodland. The foreground is dominated by dense, bright green vegetation, likely broad-leaved plants. In the mid-ground, there are several tall, slender trees with dense, light green foliage, possibly willows. The background shows a clear blue sky with a few wispy white clouds. The overall scene is a lush, green woodland environment.

Description	Photographs
<p>Photograph 17: w1d wet woodland - f2f other swamp behind vegetation</p>	

Description	Photographs
Photograph 18: w1d wet woodland	 A photograph of a wet woodland. The foreground is dominated by dense, tall green vegetation, likely reeds or sedges. The background shows a dense canopy of trees with green foliage, with a clear blue sky visible through the branches.


Description	Photographs
<p>Photograph 19: w1g7 other broadleaved woodland types – young hazel</p>	


Photograph 20: w1g7
other broadleaved
woodland types




Photograph 21: w1g7
other broadleaved
woodland types – the
mature oaks in the north of
the predominantly planted
woodland



Description	Photographs
<p>Photograph 22: w1g7 other broadleaved woodland types – semi-mature oaks in the northern part of the predominantly planted woodland</p>	

Description	Photographs
<p>Photograph 23: w1g7 other broadleaved woodland types – planted field maple, hornbeam, hazel and limes</p>	

Description	Photographs
<p>Photograph 24: w1g6 line of trees – u1e linear fence line visible with large mature oak</p>	

Description	Photographs	
Hedgerow Survey		
<p>Photographs 25 - 28: Hedgerow 001 - classified as a priority hedgerow.</p>		

Description	Photographs	
		

Description	Photographs	
<p>Photograph 29-32: Hedgerow 002 - classified as a priority hedgerow.</p>		

Description	Photographs	
		