High Speed Two

Phase One: London-West Midlands Ancient Woodland Strategy

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1 Executive summary

1.1.1 Ancient woodlands are areas that have been continuously wooded since at least 1600 AD. Ancient woodlands are complex ecosystems, and as they take hundreds of years to establish. They are irreplaceable. Both ancient semi-natural woodland (ASNW), and plantations on ancient woodland (PAWS) sites are afforded equal policy protection under the National Planning Policy Framework (NPPF).

1.1.2 In accordance with the recommendations of Natural England's review of HS2 Ltd's no net loss in biodiversity calculation, ancient woodland and compensation to be provided in response to ancient woodland losses has been removed from the no net loss calculation.

1.1.3 This document, the Ancient Woodland Strategy for HS2 Phase One, provides an area based comparison between the losses of ancient woodland habitat that will occur as a consequence of the scheme and the associated package of compensation measures to be provided in response to those losses that cannot be reasonably avoided.

1.1.4 Data from a wide range of sources, including national datasets (e.g. Natural England's ancient woodland inventory), regional datasets, and information provided by stakeholders such as Natural England and the Woodland Trust have been utilised to inform production of the strategy.

1.1.5 The route wide assessment within the SES3 and AP4 ES reported that the scheme was expected to result in the loss of 30.1ha of ancient woodland. Cumulatively these losses were identified as a residual adverse effect on an irreplaceable resource significant at the national level.

1.1.6 Following updates made following completion of the SES and AP process, the outputs of the strategy show that overall Phase One of HS2 is expected to result in losses of approximately 29.4ha of ancient woodland (24.8ha ancient semi-natural woodland and 4.6ha of plantation on ancient woodland) (see Table 1 for a summary and for a breakdown by woodland see Table 41). This is a reduction of 0.8ha from that reported in the SES3 and AP4 ES.

1.1.7 The largest scale loss from any single ancient woodland is 3.6ha from Broadwells Wood (CFA 18), which consists of 3.2ha of ancient semi-natural woodland and 0.4ha PAWS.

1.1.8 A total of 32 ancient woodlands will be subject to direct loss of habitat as a consequence of the scheme. This remains a residual adverse effect on an irreplaceable resource significant at the national level. Of the 32 ancient woodlands where direct losses will occur, at 19 of these the area of ancient woodland that will be lost as a consequence of the scheme is less than 1ha. This includes 12 ancient woodlands where the area of ancient woodland lost will be less than 0.5ha.

1.1.9 No additional ancient woodlands (i.e. beyond the 32 subject to direct effects through habitat loss) are expected to be subject to significant adverse effects.

1.1.10 Ancient woodland is an irreplaceable resource. Where effects on ancient woodland cannot be reasonably avoided then HS2 Ltd has committed to provide a range of compensation measures in response to these losses.

Table 1: Overview of ancient woodland strategy

	Direct loss of ancient woodland (ha)	Areas of ancient woodland within the land covered by the Bill that will be retained (ha)	Area of receptor sites for ancient woodland soils (ha)	Areas of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soils receptor) (ha)	Area of enhancement and/or restoration of ancient woodland (ha)	Area of enhancement and/or restoration of non-ancient woodland (ha)
TOTALS	**29.4 (including 4.6ha Plantation on Ancient Woodland (PAWS)**	**11.9**	**27.5**	**112.5**	**17.3**	**13**

1.1.11 No set ratios of loss to gain have been used in determining an appropriate level of compensation response. The level of compensation provision provided in each case has been derived through professional judgement, taking into account the scale of the impacts and the value of the woodland affected, which differ in terms of both the existing habitat structure, and the diversity of the areas concerned.

1.1.12 A route wide summary of the compensation measures currently proposed in response to effects on ancient woodland habitats is as follows (see Section 7 for further details):

- 27.5ha of ancient woodland soils[1] to be translocated to receptor sites;
- 112.5ha of new woodland planting (N.B. this is in addition to the areas identified as receptor sites for ancient woodland soils);
- 17.3ha of enhancement of ancient woodland; and
- 13.0ha of enhancement of non-ancient woodland habitat.

1.1.13 The above measures are considered a robust and proportionate response to the loss of ancient woodland that is expected to occur as a consequence of the scheme. These measures are additional to those considered within the HS2 Ltd no net loss calculation for replaceable habitats, which is reported separately and is expected to result in a net gain in the extent of woodland and scrub habitat of an additional 550ha.

1.1.14 In response to Natural England's review of HS2 Ltd's no net loss in biodiversity metric the Department for Transport has committed to further increasing its compensatory response to the expected loss of ancient woodland. As a consequence HS2 Ltd will:

- seek to maximise woodland planting on land bought in relation to HS2 – initial

[1] These areas are expected to be planted following soil translocation carried out in accordance with the Ecology Technical Standard.

estimates suggest that this will be up to 50 hectares; and

- establish a £5 million fund to support third party woodland planting projects to provide woodland enhancement beyond what is required under standing advice from Natural England and the Forestry Commission.

1.1.15 In accordance with the Code of Construction Practice (CoCP) and the Environmental Minimum Requirements (EMR's), during detailed design and construction efforts will continue to be made to seek to avoid or further reduce the impacts of the scheme. As a consequence the 29.3ha of ancient woodland losses currently expected should be considered to be a worst-case figure which may be improved upon during detailed design.

1.1.16 As detailed design is undertaken, further information will be gathered relating to both the areas of ancient woodland that will be affected, and proposed receptor sites. As this further information becomes available HS2 Ltd will continue to work with local landowners, Natural England and other relevant bodies during detailed design to refine the compensation strategy for each woodland. Where appropriate this may include consideration of alternative (and available) locations for compensatory provision put forward by HS2 Ltd or other landowners. For example, opportunities that may allow consolidation of smaller fragments of compensation planting within a larger area of habitat creation that will be easier to manage and conserve in the long term.

2 Abbreviations, acronyms and descriptions

Table 2: Abbreviations, acronyms and descriptions

Abbreviation/Acronym	Description
AP	Additional Provision
ASNW	Ancient Semi-natural Woodland
CAD	Computer-aided design
CIEEM	Charted Institute of Ecology and Environmental Management
ES	Environmental Statement
EIA	Environmental Impact Assessment
EMR	Environmental Minimum Requirements
ERG	Ecological Review Group
ESMP	Ecology Site Management Plan
GIS	Geographical Information System
ha	hectare
LNR	Local Nature Reserve
LWS	Local Wildlife Site
km	kilometre
NIA	Nature Improvement Area
NCC	Nature Conservancy Council
NNL	No net loss
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NVC	National Vegetation Classification
m	metre
PAWS	Plantations on ancient woodland sites
QA	Quality assurance
SES	Supplementary Environmental Statement
SINC	Site of Importance for Nature Conservation
SSSI	Site of Special Scientific Interest
SES	Supplementary Environmental Statement
SMR	Scope and Methodology Report
TWAO	Transport and Works Act Order

3 Introduction

3.1 Background to High Speed Two

3.1.1 The Hybrid Bill for high speed rail between London and the West Midlands ('the Bill') was submitted to Parliament together with an Environmental Statement (ES) in November 2013 ('the main ES'). If enacted by Parliament, the Bill will provide the powers to construct, operate and maintain Phase One of High Speed Two (HS2). This phase of HS2 will provide a new north-south railway between London, Birmingham and the West Midlands.

3.1.2 Since deposit of the Bill in November 2013, the need for a variety of changes to the scheme has arisen through the High Speed Rail (London – West Midlands) Select Committee process, on-going discussions with petitioners and key stakeholders, and as a result of design refinements.

3.1.3 Those changes which do not require an amendment to the Bill (e.g. changes to construction assumptions, new environmental baseline information and corrections to the main ES) have been reported in a series of Supplementary Environmental Statements (SES). Changes to the scheme that require amendments to the Bill have been promoted in Parliament through a series of Additional Provisions (AP), which were each accompanied by an ES.

3.1.4 This section will provide an introduction to both Phase One of HS2, and information to place the ancient woodland strategy within a wider context.

3.2 Background to HS2's ancient woodland strategy

3.2.1 Based on the recommendations of the Natural England review of HS2's no net loss in biodiversity calculation, ancient woodland habitats have been removed from the calculation in order to make it clear that ancient woodland losses are irreplaceable.

3.2.2 HS2's no net loss in biodiversity objective (and associated calculation) therefore now only relates to losses and gain in replaceable habitats. Ancient woodland and associated compensation measures therefore fall outside of the scope of the HS2 no net loss calculation for replaceable habitats.

3.2.3 This document (the Ancient Woodland Strategy for HS2 Phase On) provides an area based comparison of the losses of ancient woodland habitat that will occur as a consequence of the scheme and the associated package of compensation measures to be provided in response to those losses that cannot be reasonably avoided.

3.2.4 The ancient woodland strategy supersedes and consolidates three separate ancient woodland strategy documents produced previously by HS2 for individual sections of the route and shared with some key stakeholders.

4 Context for HS2's ancient woodland strategy

4.1 Introduction

4.1.1 This chapter provides background information relating to the role of the HS2 ancient woodland strategy for Phase One, the underlying policy context, and the process followed in developing the package of compensation measures proposed.

4.2 Policy and guidance

4.2.1 Natural England and the Forestry Commission's standing advice in relation to ancient woodland defines ancient woodland as any area that has been wooded continuously since at least 1600 AD. It includes:

- 'ancient semi-natural woodland' mainly made up of trees and shrubs native to the site, usually arising from natural regeneration;
- 'plantations on ancient woodland sites'- areas of ancient woodland where the former native tree cover has been felled and replaced by planted trees, usually of species not native to the site

4.2.2 All ancient woodlands are therefore afforded equal policy protection, and all losses of ancient woodland are considered irreplaceable[2].

4.2.3 Section 118 of The National Planning Policy Framework (NPPF)[3] sets out a series of principles that should be taken into account when determining planning submissions, which include the following in relation to ancient woodland:

- *Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss*;

4.2.4 The accompanying National Planning Practice Guidance (NPPG)[4] states that:

- *Both Ancient Semi-Natural Woodland (ASNW) as well as Plantations on Ancient Woodland Sites (PAWS) are ancient woodland. Both types should be treated equally in terms of the protection afforded to ancient woodland in the National Planning Policy Framework.*

4.2.5 England's biodiversity strategy for the period up to 2020 [5] also references the Government's commitments in relation to ancient woodland, as follows :

- *We are committed to providing appropriate protection to ancient woodlands and to more restoration of plantation on ancient woodland sites (in recognition of that particular*

[2] Gov.uk (2015) Ancient woodland and veteran trees: protecting them from development. https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#history Accessed 13/02/17.
[3] Department for Communities and Local Government (DCLG, 2012) National Planning Policy Framework. DCLG, London.
[4] Gov.uk (2016) National Planning Practice Guidance - Natural Environment https://www.gov.uk/guidance/natural-environment Accessed 13/02/2017.
[5] Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Defra, London.

value)….

4.2.6 In considering schemes where impacts on ancient woodland are likely to occur Natural England's standing advice in relation to ancient woodland[6] advises that the mitigation hierarchy should be implemented and in the first instance efforts should be made to avoid ancient woodland through redesigning the scheme.

4.2.7 Where the relevant planning authority decides to grant permission in line with the NPPF, then appropriate mitigation or compensation should be provided. Given that ancient woodland is irreplaceable any habitat creation provided in response to these losses is not a direct replacement. However, establishing new trees and woodland, as well as other measures such the translocation of ancient woodland soils[7], and the restoration of existing ancient woodland are identified as potentially acceptable methods of providing mitigation or compensation where losses of ancient woodland occur.

4.3 Ancient woodland inventory

4.3.1 In the early 1980's the Nature Conservancy Council (NCC) compiled an inventory of woodland sites to identify those likely to be ancient. This project involved utilising a range of a historic data from old maps and documents, alongside field survey information and aerial photograph interpretation to identify all woodland in Britain which had existed since 1600AD.

4.3.2 Only woodland sites over 2ha (on the 1930's base maps used in the project) were included on the original inventory, and some of the woodlands less than 2ha that were excluded are likely to be ancient[8]. In recent years Natural England (who now maintain and update the inventory for England) have added to the national inventory for England (hereafter 'the ancient woodland inventory) some areas of ancient woodland that are less than 2ha in size where recent updates to local ancient woodland inventories have been undertaken with the aim of identifying all areas of ancient woodland, regardless of their size. In addition, parcels of ancient woodland that were identified in the original NCC project have remained within the inventory even where there have been subsequent losses of ancient woodland that have reduced the area of ancient woodland remaining to less than 2ha.

4.3.3 Following the publication of the main ES in November 2013, the Woodland Trust identified to Natural England a series of woodlands of less than 2ha in size in the vicinity of the scheme which it believed to be ancient. HS2 subsequently commissioned its consultants to undertake a review of available data for these sites (including historic mapping) to verify their status. This evidence was provided to Natural England to inform decision making on the status of each woodland concerned. This process culminated in HS2 Ltd updating its assessment of the total area of ancient woodland affected by the scheme within the SES and AP2 ES in July 2015, to recognise all sites agreed with Natural England to be ancient. These additional sites were subsequently added to Natural England's ancient woodland inventory in October 2015.

[6] Gov.uk (2015) Ancient woodland and veteran trees: protecting them from development. https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#history Accessed 13/02/17.
[7] Ancient woodlands cannot be translocated as they are a highly complex ecosystem. However, collecting and moving the soils from translocated areas of ancient woodland is likely to
[8] Ancient Woodland Inventory (Provisional) for England - Digital Boundaries, Natural England http://www.gis.naturalengland.org.uk/pubs/gis/tech_aw.htm (accessed 17.04.15)

4.4 Development of HS2 compensation proposals

4.4.1 Ancient woodland ecosystems are highly complex and have developed over several hundred years. It is not possible to translocate ancient woodland habitat, or mitigate its loss. HS2 Ltd has sought to avoid and reduce ancient woodland during the preliminary design work undertaken to date, and where losses of ancient woodland are expected to occur as a consequence of the scheme these losses have been recorded within the ES documents as permanent adverse residual effects.

4.4.2 The main ES and subsequent AP ESs document the avoidance, mitigation and compensation measures that have been incorporated into the scheme. This approach was undertaken following due consideration of the mitigation hierarchy, as summarised in Figure 1 and set out in further detail within the 'Ecological Principles of Mitigation' Technical Note (November 2013 ES, Volume 5 Appendix: SMR Addendum).

4.4.3 The scheme has been designed, where reasonably practicable, to avoid impacts on sensitive ecological receptors. However, given the scale of the scheme, and a series of sometimes conflicting environmental constraints, there are locations where impacts on ecological effects cannot be reasonably avoided.

4.4.4 Where the potential for significant adverse ecological effects was identified, feedback has been provided to the design team and the scope for avoiding or reducing the impacts (i.e. mitigation has been considered. This process has been driven by collaborative working between the HS2 Ltd engineering, design and environmental teams and has been informed by the consultation and engagement process associated with the main ES, and subsequent AP ES's.

4.4.5 The compensation measures provided for in the Hybrid Bill in response to adverse effects on habitat and species as a consequence of the scheme were determined as part of the ecological impact assessment reported within the ES.

4.4.6 Where losses of ancient woodland are expected to occur a range of compensatory measures are proposed by HS2 Ltd in response to the loss of ancient woodland habitats across the route including:

- translocation of ancient woodland soils;
- translocation of coppice stools;
- new woodland creation; and
- enhancement and/or restoration of existing woodlands through management.

4.4.7 A combination of the above measures will be employed in order to provide an appropriate level of compensation for each ancient woodland loss that occurs as a result of the scheme. No set ratios of loss to gain have been utilised in determining an appropriate level of compensation response.

4.4.8 The compensation requirements for individual impacts were considered on a 'site by site' basis, taking into account the scale of the impacts and the value of the woodland affected; which differ in terms of both the existing habitat structure, and the flora and faunal diversity of the areas concerned. These requirements were then consolidated into a suitable

compensation strategy for the wider local area (e.g. consolidating the creation of new woodland in one area to address losses of two separate areas of broadleaved woodland). The approach to determining the level of compensation included within the Hybrid Bill for HS2 Phase One is the same as that traditionally used by all major UK infrastructure projects over the last 30 years. This process did not involve the use of a biodiversity offsetting metric or other loss to gain ratios.

4.4.9 The detailed design of the scheme is yet to be undertaken and therefore there remain opportunities to reduce the effects of the scheme on ancient woodland. In addition, there may be the potential to refine the compensatory measures currently proposed where this can be achieved through agreement with landowners and stakeholders, and without delay to project programme.

4.4.10 It should be noted that the salvage and translocation of ancient woodland soils has been included as a compensatory measure that will (where conditions are suitable) act to provide the best opportunity to retain some of the diversity associated with the ancient woodland seed (and bulb) bank, mycorrhiza and other fungi and invertebrates. Such measures will form one part of the compensatory response, and even where ancient woodland soils are translocated the soils receptor areas would not be considered to represent ancient woodland.

5 Methodology

5.1 Scope of the ancient woodland strategy

5.1.1 The scope of the ancient woodland strategy for Phase One of HS2 covers:

- all ancient woodlands identified to be impacted by the scheme within the main ES and associated AP ESs; and
- all compensatory habitat creation and habitat enhancement currently proposed specifically in response to the loss of ancient woodland.

5.1.2 All areas of habitat that are considered within the ancient woodland strategy are excluded from the scope of the HS2 no net loss calculation for replaceable habitats. Therefore, all compensatory habitat creation and habitat enhancement measures referred to within this strategy are in addition to those considered within the no net loss calculation.

5.1.3 This version of the ancient woodland strategy does not currently include consideration of any additional ancient woodland compensation measures that may be provided through the £5 million of additional funding announced by the Department for Transport in November 2016 to support third party woodland planting projects. However, it is expected that the compensation proposals that arise from this funding source will be incorporated into this document in the future.

5.1.4 Details of specific measures for long-term management and monitoring for each ancient woodland will be prepared at the relevant detailed design stage and included within the relevant iteration of the Ecology Site Management Plan (ESMP) for that location.

5.1.5 It is expected that all future relevant information relating to each ancient woodland will be captured by the respective ESMP and not in an updated Ancient Woodland Strategy.

5.2 Approach

5.2.1 This document collates, updates and expands upon the information reported in draft ancient woodland strategy documents prepared for HS2 Ltd internal use during 2015/2016.

5.2.2 The content principally draws upon information that has been collected in support of the ecological impact assessments reported in the main ES, and the subsequent AP ESs.

5.2.3 For each ancient woodland, relevant content relating to the expected impacts on ancient woodland, and the proposed compensation in response to these losses have been populated under a series of standard headings as set out in Table 3.

Table 3: Information provided for each ancient woodland affected by the scheme

Section heading	Description of content included in this section
Baseline conditions	Current conditions at the ancient woodland to be affected based on available desk study and field survey data.
Valuation	CIEEM geographic frame of reference allocated within the main ES or relevant subsequent SES or AP ES.
Measures taken to avoid or reduce impacts	Summary of measures incorporated during the scheme design to date that have served to avoid of reduce impacts on ancient woodlands. This section includes a summary of any changes that have been implemented as part of amendments to the scheme design documented in a relevant SES or AP ES.
Impacts and associated effects	This section provides details of the expected area of ancient woodland affected by the scheme (ha), and the geographical level at which the resultant effect is considered to be significant.
Compensatory measures	This section provides a summary of compensatory measures to be provided in response to effects on ancient woodland. This includes (where applicable) details of the proposed receptor site for ancient woodland soils; initial data regarding soil conditions at donor and receptor site; extent of new woodland planting (ha); and details of any proposed enhancement of existing woodland.

5.3 Data sources

5.3.1 Table 4 provides a summary of key data sources that informed the production of HS2's ancient woodland strategy.

Table 4: Summary of key data sources utilised in the ancient woodland strategy

Data type	Description	Source(s)
Natural England ancient woodland inventory	Location of ancient woodlands	Natural England via data.go.uk website[9]
Statutory site designation details	Citations for woodlands affected by the scheme that are designated as statutory nature conservation sites	Natural England[10] Multi-Agency Geographic Information for the Countryside (MAGIC)[11]

[9]Data.gov.uk (2016) Ancient Woodlands (England) https://data.gov.uk/dataset/ancient-woodlands-england1
[10] http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp & https://designatedsites.naturalengland.org.uk/SiteSearch.aspx
[11] http://www.magic.gov.uk/

Data type	Description	Source(s)
Non-statutory site designation details	Designation details for non-statutory sites for nature conservation. This data was obtained from various local authorities and Local Environmental Records Centres (LERCs) across the route	Greenspace Information for Greater London Hertfordshire Environmental Records Centre Buckinghamshire and Milton Keynes Environmental Records Centre Warwickshire County Council (Warwickshire Biological Records Centre) Staffordshire Ecological Record
Historic Maps	Historic map regression using publicly available early maps including: estate, survey, tithe, and available Ordnance Survey maps	Heritage Gateway Online[12] Staffordshire and Stoke-on-Trent Archives
Field data from HS2 habitat surveys	Phase 1 habitat survey and National Vegetation Classification (NVC) survey data from field surveys undertaken by HS2 where access has been available	HS2 via gov.uk website (HS2 Phase One environmental statement volume 5: ecology appendices), and further surveys undertaken since the 2013 ES (unpublished).
Ecology Chapters of HS2 Phase ES	Ecology chapters of the main ES and subsequent AP ES, detailing the expected scale of habitat losses from ancient woodland and compensation to be provided in response to these losses.	HS2 via gov.uk website (HS2 Phase One Volume 2 CFA reports for main ES[13], SES and AP2 ES[14],, and SES3 and AP4 ES[15]
Archaeological Record	Review of archaeological record	HS2 via gov.uk website (HS2 Phase One environmental statement volume 5: cultural heritage appendices[16])
Aerial Photography	Review of aerial photography surveys	HS2 Ltd (fly over aerial photography of the route alignment)

[12] Heritage Gateway (2016) Online search facility for information on England's historic sites and buildings http://www.heritagegateway.org.uk/gateway/default.aspx

[13] https://www.gov.uk/government/publications/hs2-phase-one-environmental-statement-volume-2-community-forum-area-reports-and-map-books/hs2-phase-one-environmental-statement-volume-2-community-forum-area-reports-and-map-books

[14] https://www.gov.uk/government/publications/volume-2-community-forum-area-reports-and-map-books

[15] https://www.gov.uk/government/publications/ses3-and-ap4-es-october-2015-volume-2-community-forum-area-reports-and-map-books

[16] https://www.gov.uk/government/publications/hs2-phase-one-environmental-statement-volume-5-cultural-heritage/hs2-phase-one-environmental-statement-volume-5-cultural-heritage

Data type	Description	Source(s)
LiDAR	Review of Environment Agency LiDAR survey data (selected woodland only)	Data.gov.uk website[17]
Place names	Review of place names (CFA25 only)	William Dargue – An Online History of Birmingham Placenames[18]
Soils data	Soils data for the scheme as reported in the agriculture, forestry and soils assessment	HS2 via gov.uk website (HS2 Phase One environmental statement Volume 5; agriculture, forestry and soils

5.4 Constraints

5.4.1 Due to access restrictions it has not been possible to access all affected ancient woodland sites to undertake field survey. Where baseline survey has not been possible prior to Royal Assent, detailed vegetation survey will be undertaken prior to the commencement of construction, to provide a robust baseline to inform any proposed translocation of soils or plant material and inform future targets for monitoring and management.

5.4.2 Natural England's ancient woodland inventory was found to contain some errors which over-estimate the extent of ancient woodland. For example, in some locations ancient woodland was found to be mapped on the embankment of modern railway cuttings, or extending into adjacent arable fields. Where such errors have been identified the extent of ancient woodland areas accounted for within this document has been adjusted accordingly.

5.4.3 During the review of historical data, maps and documents it was not always possible to obtain access to all pre-nineteenth century mapping, due to copyright issues and/or incomplete mapping. In addition incomplete or imprecise supporting documents, such as tithe apportionments or survey records represented a constraint to the historical review. Best endeavours were made to access and utilise relevant historic information to determine which woodlands are likely to be ancient.

5.4.4 During production and quality assurance of this report errors have been identified within the three separate ancient woodland strategy documents that were previously provided in draft to some relevent third parties for their information. The separate strategy documents are superseded by this document, and all errors identified have been addressed within this version of the strategy. All updated figures are based on the assumptions detailed in this document, and estimates are made in advance of the detailed design of the scheme.

[17] Data.gov.uk - Lidar Composite DSM - 2m available at https://data.gov.uk/dataset/lidar-composite-dsm-2m1

[18] William Dargue (2016) William Dargue – A History of Birmingham Places and Placenames from A to Y https://billdargue.jimdo.com/placenames-gazetteer-a-to-y/

5.5 Route-section specific assumptions

CFA 1 to CFA6

5.5.1 The only ancient woodland within land required for the Scheme in CFA1 to CFA6 inclusive is Newyear's Green Covert (CFA 6). This woodland will be retained and an assurance to this effect (Ref HoC/1508) was given to the Woodland Trust (see Appendix 1) during the House of Commons Select Committee process.

CFA 7 to CFA15

5.5.2 It is understood that the scheme design will no longer include the provision of the haul road through Uxbridge Golf Course, which would have passed within close proximity of the western boundary of Pinnocks Wood, an area of ancient semi-natural woodland. It is assumed that the scheme design will now revert to the AP2 scheme at this location. Therefore, no impacts on Pinnock's Wood are expected.

5.5.3 Since submission of the main ES, a revised design to the Chilterns Tunnel has been developed, extending it by approximately 2.6km and emerging to the north-west of South Heath. The extension of the tunnel means that the route will pass beneath a number of areas of ancient woodland that would previously have been affected by the scheme. As such, the scheme will not result in any habitat loss from the following ancient woodlands: Farthings Wood, Mantle's Wood and Sibley's Coppice (all located in CFA 9).

5.5.4 The revised ancient woodland inventory includes areas of habitat that are situated on cuttings of the Aylesbury Link railway line, and the FCC sidings to the south of Calvert. They are unlikely to represent ancient woodland due to the removal of topsoil required for the construction of railway infrastructure. HS2 Ltd has informed Natural England of this discrepancy in the ancient woodland inventory.

5.5.5 The land identified as required for the construction and operation of the scheme includes a small area (less than 0.1ha) within the boundary of Sheephouse Wood SSSI. This area forms part of a woodland ride that runs perpendicular to the alignment. It was originally included within the scheme in order to allow planting up of the ride to aid initial bat mitigation proposals in this area. The need for this planting has subsequently been superceded by the inclusion of the Sheephouse Wood mitigation structure. HS2 Ltd does not now intend to undertake any works within the boundary of Sheephouse Wood SSSI.

5.5.6 HS2 Ltd is promoting an application for a Transport and Works Act Order (TWAO) to relocate the FCC Waste Services (UK) Ltd. railway sidings to the south of Sheephouse Wood at Greatmoor, Buckinghamshire, opposite the Greatmoor Energy from Waste (EfW) facility. If the application is successful, the areas which would have specifically been required for the previous relocation site for the railway sidings north of Decoypond Wood, implemented as part of AP4, will be retained under their current land uses, which include part of an area of ancient woodland. The impacts on this ancient woodland have been described for both scenarios (i.e. where the application for a TWAO is successful and where the application is not successful) in the relevant section (See Section 6.1.11).

5.5.7 There are on-going discussions with landowners regarding the woodland planting required to compensate for the impacts on ancient woodland in the Bernwood Forest area (CFA12/CFA13). The changes being discussed are, with regards to the location of the planting

and potential alterations in order to better accommodate current agricultural land use. Any alterations to the planting will ensure that commitments to provide the same extent and level of connectivity as those measures currently included in the scheme will be maintained, and any changes will also ensure that these do not affect specific mitigation measures, such as providing flightlines for bats.

CFA16 to CFA22

5.5.8 No route section specific assumptions have been used in the evaluation and assessment of ancient woodlands within CFA16-CFA22.

CFA23 to CFA26

5.5.9 Within CFA25 the overhead high voltage line diversion has been designed to avoid additional loss of ancient woodland at Park Hall Wood (0.35ha already lost as a consequence of the construction of the Water Orton Cutting), and to avoid any losses at Parkhill Wood and Langley Hill Wood.

5.5.10 It is anticipated that some tree management works will be required at Parkhill Wood and Langley Hill Wood to facilitate the temporary high voltage line diversion. However, no intrusive works will be undertaken in these areas, and it is expected that the required management work are actually likely to enhance the condition of the woodland areas concerned.

6 Affected ancient woodlands and associated compensatory measures

6.1 Introduction

6.1.1 Sections 6.2 to 6.37 of this report provide detail of each of the ancient woodlands that are expected to be affected by the scheme, and the associated compensatory measures that are proposed in response to these losses. The text descriptions provided for each woodland should be read in conjunction with the corresponding maps which are included within Appendix 1.

6.1.2 Table 4, at the end of section 7, provides a route-wide summary of the impacts of the Proposed Scheme on ancient woodland and the associated compensatory provision in response to these losses.

6.1.3 Further details regarding the approach to the creation and management of compensatory habitats, which will apply to all sites where loss of ancient woodland habitat occur are provided below.

Translocation of ancient woodland soils

6.1.4 Detailed design of the scheme has yet to be undertaken, and in some locations it still has not been possible to gain access to undertake detailed baseline surveys. At this stage of the project it has been assumed that at all locations where losses of ancient woodland occur as a consequence of the scheme, the soil material will be translocated to a suitable receptor site.

6.1.5 Sections 6.2 to 6.37 of this document identify the currently proposed receptor sites for ancient woodland soils. As part of the detailed design process, surveys are to be undertaken at all proposed donor and receptor sites to confirm both:

a) those sites where it is beneficial to undertaken translocation of ancient woodland soils, and

b) the exact size and location of the receptor sites required.

6.1.6 The process of agreeing which woodlands support soils that it is worthwhile translocating will involve consultation with both Natural England and the Woodland Trust.

6.1.7 All translocation of ancient woodland soil that is undertaken will be conducted in accordance with the guidance and requirements set out within *Ecology Technical Standard (*see Appendix 3). It is expected that all soil receptors areas will be planted in accordance with the Ecology Technical Standard. Where appropriate translocation of coppice stools, saplings and dead wood will also be considered during detail design of these habitat creation areas.

6.1.8 In advance of detailed design there remain some discrepancies between the area of soils donor sites (i.e. areas where ancient woodland will be lost) and the proposed ancient woodland soils receptor sites. These discrepancies will be resolved during the detailed design process and in general it is expected that ancient woodland soils from those areas impacted will be salvaged and translocated to an area roughly similar in area to that where the impacts occurred. Where the size of the donor and receptor sites differ ,the following approach will be applied:

- Where the area of the proposed soils' receptor exceeds that of the area of ancient woodland that will be lost, then soils will only be translocated to an area of similar size to that where the impact occurred. Under such circumstances the remainder of the area will receive compensatory planting in accordance with the Ecology Technical Standard prescription for areas were no soil translocation is proposed (see Appendix 4).;
- Where the area of the proposed soils' receptor is less than the area of ancient woodland from which soils are deemed suitable for translocation, these will be translocated to other suitable areas within the land required for the scheme where compensatory woodland planting is already proposed.

Soil survey and physical characteristics

6.1.9 At present detailed soil survey information is not yet available for all potential donor and receptor areas.

6.1.10 In accordance with the Ecology Technical Standard detailed soil survey to record soil conditions and physical characteristics of the woodland will be undertaken at both the proposed donor and receptor sites to inform soil translocation. This will include details of the nutrient levels, soil texture, total depth, horizon thickness, rooting depth and structure.

Woodland planting

6.1.11 The reporting of compensatory measures draws a distinction between areas that will be receptor sites for ancient woodland soils, and all others areas of compensatory planting that will be provided in response to ancient woodland losses.

6.1.12 All areas of new planting to be provided in response to the loss of ancient woodland reported in Section 6.2 to 6.37 are in addition to those areas that will act as soil receptors (and will also, in due course be subject to planting). All areas of new woodland planting will be undertaken in accordance with the guidance set out within the Ecology Technical Standard (see Appendix 3).

Management and monitoring

6.1.13 HS2 Ltd has set out indicative commitments to the management and monitoring of ecology led habitat creation in support of HS2 Phase One, during the period of establishment within *Information Paper E26: Indicative Periods for the Management and Monitoring of Habitats Created for HS2 Phase One*[19].

6.1.14 HS2 Ltd has committed to managing and monitoring all locations where the translocation of ancient woodland soils is proposed for 50 years. For those locations where new areas of woodland habitat creation are proposed as part of the ecology compensation response management and monitoring will be provided for up to 50 years.

19 HS2 (2015) High Speed Two Information Paper - E26: Indicative Periods for the Management and Monitoring of Habitats Created for HS2 Phase One. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/437413/E26_-__Indicative_Periods_for_the_Management_and_Monitoring_of_Habitats_v1.1.pdf Accessed 7th December 2015.

6.2 Newyear's Green Covert (CFA 6)

Baseline conditions

6.2.1 New Year's Green Covert (see Figure EC-AWS-001) contains an area of ancient semi-natural woodland (2.2ha) that is located entirely within land that was identified within the Hybrid Bill plans as required for the construction and operation of the Scheme. Access has not been available to allow HS2 Ltd to conduct field survey of this woodland. However, it forms part of the larger Newyears Green Site of Biological Importance Grade 1 (SBI.I). The covert is described within the designation details as dominated by pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*) and hornbeam (*Carpinus betulus*).

Valuation

6.2.2 New Year's Green Covert was assessed as being of district/borough value within the ES, based on its designation as a SBI.I.

Measures taken to avoid or reduce impacts

6.2.3 The ancient woodland within Newyear's Green Covert is located within the land that was identified as being required for the Scheme. However, it has always been the intention of HS2 Ltd to ensure the retention of all of the areas of ancient woodland that fall within the Scheme. The woodland will be retained and an assurance to this effect (Ref HoC/1508) was given to the Woodland Trust (see Appendix 1) during the House of Commons Select Committee process

Impacts and associated effects

6.2.4 All areas of ancient woodland within Newyear's Green Covert will be retained. There will be no loss of ancient woodland and no indirect effects are anticipated on retained areas.

Compensatory measures

6.2.5 No losses of ancient woodland will occur at this site. Therefore, no compensatory measures are required.

Table 5 Ancient woodland strategy summary for Newyear's Green Covert

Woodland	Newyear's Green Covert
CFA	CFA 6
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Direct loss of ancient woodland (ha)	**0.0**
Area of ancient woodland located within the Hybrid Bill limits that will be retained, and not utilised during either construction or operation (ha)	**2.2**
Area of receptor site for ancient woodland soils (ha)	**0.0**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor) (ha)	**0.0**
Enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

6.3 Pinnocks Wood (CFA 7)

Baseline conditions

6.3.1 Pinnocks Wood (2.2ha) is ancient semi-natural woodland. HS2 Ltd have not been able to conduct survey of Pinnocks Wood to date, due to access refusals. The London Wildlife Trust (LWT) has provided a photograph showing that parts of the wood are degraded due to management/use. No other information on this wood is currently available.

Valuation

6.3.2 Pinnocks Wood has not been accessed for survey and despite the information from the LWT suggests that parts of the wood are degraded, however 'reasonable worst case' valuation has been assigned. As such, Pinnocks Wood is considered to be of up to county/ metropolitan value.

Measures taken to avoid or reduce impacts

6.3.3 The main ES reports that no significant impacts are expected on the ancient woodland within Pinnocks Wood as electricity cables will be tunnelled beneath the wood. The depth of the utilities will be sufficient to avoid adverse effects on tree roots and thus no direct impact on this woodland is expected.

6.3.4 The scheme includes provision for a temporary haul road through Uxbridge Golf Course, which was initially identified as being likely required to reduce the level of traffic on Swakeleys Road / Harvil Road. The haul road would pass through Fray's Farm Meadows SSSI for approximately 250m, and as such avoid any direct habitat loss from Pinnocks Wood, which is immediately east of the SSSI boundary at this location. However, the impacts of nitrogen and dust deposition over the nine-year period over which the haul would be constructed, in operation and subsequently removed could give rise to a temporary adverse effect on the conservation status of Pinnocks Wood. Changes in nitrogen and dust deposition would affect

approximately 0.3ha (13.5%) of ancient semi-natural woodland on the western edge of the Pinnocks Wood.

6.3.5 Following further traffic modelling in support of the detailed design it is currently assumed for that the haul road will no longer be required, and therefore as a consequence no impact on Pinnocks Wood is expected to occur. During detailed design the requirement for the haul road will be reviewed. In the unlikely event that it is required then the ancient woodland strategy will be updated to reflect this.

Impacts and associated effects

6.3.6 No impacts on the ancient woodland at Pinnocks Wood (see Figure EC-AWS-002) are expected as the electricity cables that will pass through this site will be tunnelled underground. The depth of the utilities will be sufficient to avoid adverse effects on tree roots and will thus avoid adverse effects on the conservation status of the wood.

Compensatory measures

6.3.7 No compensatory measures are proposed or required.

Table 6.Ancient woodland strategy summary for Pinnocks Wood

Woodland	The Pinnocks Wood
CFA	CFA 7
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Direct loss of ancient woodland (ha)	**0.0**
Area of ancient woodland located within the Hybrid Bill limits that will be retained, and not utilised during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.0**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor) (ha)	**0.0**
Enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

6.4 Ranston Covert and Battlesford Wood (CFA 7)

Baseline conditions

6.4.1 Ranston Covert and Battlesford Wood is ancient semi-natural woodland located within the Mid Colne Valley SSSI and qualifies as lowland mixed deciduous woodland, a habitat of

principal importance[20]. It is ash dominated woodland with frequent dog's mercury (*Mercurialis perennis*) in the ground flora.

6.4.2 National Vegetation Classification[21] (NVC) surveys undertaken in 2013[22] (Main ES Volume 5: Appendix EC-001-002) indicate that parts of these woods could be classified as NVC type ash woodland W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland. Two NVC sub-communities are present: W8d *Hedera helix* sub-community (ivy sub-community) and one with affinity to W8e *Geranium robertianum* sub-community (herb robert sub-community[23]). The understorey has a high diversity of ancient woodland indicator species including bluebell (*Hyacinthoides non-scripta*), dog's mercury, and moschatel (*Adoxa moschatellina*) and includes two populations of coralroot (*Cardamine bulbifera)*.

6.4.3 The citation for the Mid Colne Valley SSSI states that woodland in the SSSI is notable for its abundance of coralroot which has a restricted distribution nationally, but is characteristic of woodland in this locality.

Valuation

6.4.4 This area of ancient woodland is a reason for designation of the Mid Colne Valley SSSI and is therefore considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.4.5 The design of the Colne Valley Viaduct ensures that the River Colne will be diverted to flow between two viaduct piers avoiding the need for a long river diversion and the associated loss of river habitat and ancient woodland.

6.4.6 Following revisions to Natural England's ancient woodland strategy in 2014, which increased the extent of ancient woodland located within the land required for the scheme to 1.7ha, further design development was undertaken resulting in a 1.6ha reduction in the area of ancient woodland affected by the scheme.

6.4.7 A small (0.3ha) unnamed woodland approximately 500m north-west of Ranston Covert and Battlesford Wood was added to the ancient woodland inventory in 2014, and this change was reflected in the updated assessment reported in the SES and AP2 ES. An area of approximately 25m^2 of this ancient woodland is within the land required for the scheme. In view of its status as ancient woodland, no works will be undertaken within this woodland.

Impacts and associated effects

6.4.8 Following implementation of all amendments made within additional provisions (APs) the scheme will result in the loss of approximately 0.1ha of ancient semi-natural woodland from the eastern edge of Ranston Covert and Battlesford Wood (See Figure EC-AWS-003). This will result in a permanent adverse effect that will be significant at the county/metropolitan level.

[20] Habitat of principal importance includes 56 habitats that form priorities for conservation in the UK as identified in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
[21] The National Vegetation Classification (NVC) a common standard developed with the purpose of producing a comprehensive classification and description of the plant communities of Britain.
[22] HS2 Ltd (2013) Volume 5: Appendix EC-001-002 of the Hybrid Bill Environmental Statement (2013). ES 3.5.2.7-15.1 Volume 5 Technical Appendices CFA7-15: Colne Valley to Lower Boddington Ecological baseline data: designated sites, habitat surveys and flora
[23] This NVC subcommunity has a north western distribution in the British Isles, it is possible that the apparent similarity is caused by the absence or low abundance of species associated with subcommunities with a more southerly distribution.

6.4.9 As detailed in paragraph 6.4.7, the 25m² of unnamed ancient woodland north-west of Ranston Covert and Battlesford Wood that is within the land required for the scheme will be retained.

Compensatory measures

6.4.10 Table 7 provides a summary of the compensatory measures that are proposed in response to the expected effects on Ranston Covert and Battlesford Wood.

Table 7: Ancient woodland strategy summary for Ranston Covert and Battlesford Wood

Woodland	Ranston Covert and Battlesford Wood
CFA	CFA 7
Status	Ancient semi-natural woodland and forms part of Site of Special Scientific Interest.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.1**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.1**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**16.9**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.4.11 Soils and the associated seed bank from the 0.1ha of ancient woodland will be translocated to the northern boundary of Great Halings Wood within the Tilehouse Lane woodland creation area (see Figure EC-AWS-003). The affected populations of coralroot will also be translocated to this area.

6.4.12 The proposed receptor site is approximately 1.3km from the affected area of ancient woodland. Together with the provision of compensatory planting for the loss of non-ancient woodland habitat it will increase the connectivity between Juniper Wood, Little Halings Wood and Great Halings Wood, which are all ancient woodlands.

Soil conditions

6.4.13 The soil conditions at the ancient woodland donor is classified as 'loamy and clayey floodplain soils with naturally high groundwater', while the soil conditions at the receptor area is classified as 'medium loamy over clayey drift with siliceous stones'[24].

Woodland planting

6.4.14 Compensation for loss of ancient woodland will be provided through planting of approximately 16.9ha of new woodland west of Tilehouse Lane (see Figure EC-AWS-003). This planting will link Juniper Wood, Little Halings Wood and Great Halings Wood, which are all existing ancient woodlands. It is approximately 1.3km from the affected ancient woodland. This area of compensatory planting is for the loss of ancient woodland at Ranston Covert and Battlesford Wood as well as loss of non-ancient woodland habitat caused by the scheme elsewhere in the Colne Valley, including from the Mid Colne Valley SSSI.

6.5 Jones' Hill Wood (CFA 10)

Baseline conditions

6.5.1 Jones' Hill Wood (1.8ha) is ancient semi-natural broadleaved woodland dominated by beech (*Fagus sylvatica*) and qualifies as lowland mixed deciduous woodland, a habitat of principal importance. Desk study records indicate the presence of bluebell, primrose (*Primula vulgaris*) and early-dog violet (*Viola reichenbachiana*). The woodland has been subject to walkover survey, but NVC surveys are yet to be undertaken.

Valuation

6.5.2 Jones' Hill Wood is a small woodland and isolated from the extensive semi-natural broadleaved woodland that is present throughout the wider landscape. Therefore, it is considered to be of district/borough value.

Measures taken to avoid or reduce impacts

6.5.3 The land required for the construction of the scheme was minimised in the initial design reported in the Main ES to avoid the complete loss of Jones' Hill Wood. However, the scheme detailed in the Main ES still required land take of approximately 1ha.

6.5.4 Further design development was undertaken and the AP2 ES reported that reported a design change to move a construction access and temporary stockpile outside of the boundary of the ancient woodland. This avoided the loss of approximately 0.3ha of ancient woodland (a 30% reduction on that reported in the November 2013 ES).

Impacts and associated effects

6.5.5 The incorporation of AP's the scheme will result in the removal of approximately 0.7ha of ancient woodland from the southern part of Jones' Hill Wood (see Figure EC-AWS-004). Loss and fragmentation of this extent will result in a permanent adverse effect on the conservation status of this woodland that will be significant at the district/borough level.

[24] http://www.landis.org.uk/services/soilsguide/mapunit_list.cfm?sorttype_association=map_unit_name

Accessed 02/10/15

Compensatory measures

6.5.6 Table 8 provides a summary of the compensatory measures that are proposed in response to the expected effects on Jones' Hill Wood.

Table 8: Ancient woodland strategy summary for Jones' Hill Wood

Woodland	Jones' Hill Wood
CFA	CFA 10
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.7**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.7**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**4.1**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.5.7 Soil from Jones' Hill Wood will be translocated to a receptor site on the southern edge of the retained area of the wood. It is of equal size (0.7ha) to the area of Jones' Hill wood within the land required for the scheme (see Figure EC-AWS-004). The soils receptor site is located directly adjacent to the retained ancient woodland thus aims to reduce the effects of fragmentation and maximise the potential for achieving similar soil conditions.

Soil conditions

6.5.8 The affected area of Jones' Hill Wood and the translocation site are on the boundary of soil types described as 'freely draining slightly acid but base-rich soils' and 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

6.5.9 An area of approximately 4.1ha of woodland planting to compensate for the losses from Jones' Hill Wood will be situated immediately east of the retained ancient woodland and soils translocation area (see Figure EC-AWS-004). Its location provides a direct link with the unnamed wood 170m to the south-east and, in turn, this increases connectivity with Rushmoor Wood, the nearest area of ancient woodland in the district.

6.5.10 Approximately 25% of this compensation area will be used for a temporary stock pile, satellite construction compounds and an on-site construction traffic route and will be planted once

these activities are complete. The remainder of the compensation area will planted either before or at the time that habitat removal from Jones' Hill Wood occurs and will also be used a receptor site for great crested newt.

6.6 Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA 12)

Baseline conditions

6.6.1 An area of ancient woodland is present along the bridleway adjacent to the landfill south east of Calvert, and comprises approximately 1.9ha parallel to the western boundary of Sheephouse Wood SSSI. The area qualifies as habitat of principal importance, i.e. lowland mixed deciduous woodland. The 2014 update to Natural England's ancient woodland inventory resulted in a reduction in the extent of the area recognised as ancient woodland.

6.6.2 Approximately 0.4ha of the 1.9ha area identified as ancient woodland within the Natural England ancient woodland inventory is situated on the cutting of the Aylesbury Link railway line. This area is very unlikely to represent ancient woodland habitat due to the removal of topsoil required for the construction of railway infrastructure and has therefore been excluded from the extent of ancient woodland shown on Figure EC-AWS-005, and HS2's calculations of ancient woodland loss. HS2 Ltd has informed Natural England of this discrepancy in the ancient woodland inventory, and they have confirmed that they will address it in the next update to the ancient woodland inventory.

6.6.3 NVC surveys undertaken in 2013[25] indicate that the woodland resembles the NVC W8 *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland community. The canopy is dominated by pedunculate oak (*Quercus robur*) which is not characteristic for this NVC community (ash is typical). The shrub layer is dominated by bramble (*Rubus fruticosus agg.*), field rose (*Rosa arvensis*), hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*) and midland hawthorn (*Crataegus laevigata*), of which the latter is an ancient woodland indicator. The ground flora is diverse and includes 12 ancient woodland indicator species including bluebell, bush vetch (*Vicia sepium*), hairy woodrush (*Luzula pilosa*), primrose and wood anemone (*Anemone nemerosa*).

Valuation

6.6.4 This area of woodland (1.4ha) was part of Sheephouse Wood, and was split from it by the construction of the Aylesbury Link railway. Given its botanical diversity, association with Sheephouse Wood SSSI and proximity to other ancient woodlands it is considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.6.5 There were no specific measures taken to avoid or reduce the loss of ancient woodland along the bridleway adjacent to the landfill south-east of Calvert. The route of the railway is highly constrained in this location by Sheephouse Wood SSSI to the north, and the landfill and Energy for Waste (EfW) to the south and south west.

[25] HS2 Ltd (2013) Volume 5: Appendix EC-001-002 of the Hybrid Bill Environmental Statement (2013). ES 3.5.2.7-15.1 Volume 5 Technical Appendices CFA7-15: Colne Valley to Lower Boddington Ecological baseline data: designated sites, habitat surveys and flora

Impacts and associated effects

6.6.6 All of the (1.4ha area) of ancient woodland will be lost as a consequence of the construction of the rail alignment and the engineering earthworks required for the Calvert cutting, as well as land drainage and bridges. This will result in a permanent adverse effect that will be significant at the county/metropolitan level.

Compensatory measures

6.6.7 Table 9 provides a summary of the compensatory measures that are proposed in response to the expected effects on the woodland along the bridleway adjacent to the landfill south-east of Calvert.

Table 9: Ancient woodland strategy summary for woodland along the bridleway adjacent to the landfill south-east of Calvert

Woodland	Woodland along the bridleway adjacent to the landfill south-east of Calvert
CFA	CFA 12
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.4**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**1.4**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**24.0 (combined compensation for losses from five ancient woodlands in CFA12 & CFA13[26])**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.6.8 Ancient woodland soils from this woodland will be translocated to a receptor site on the northern edge of Finemere Wood, which is also ancient semi-natural woodland (Figure EC-AWS-005). The receptor area is almost of equal size to the area of ancient woodland being lost (1.4ha). It is approximately 1.3km to the south-east of the affected woodland.

Soil conditions

6.6.9 The soils in the affected area of woodland and the receptor site are both described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.6.10 An area of approximately 24ha of woodland planting will be provided to compensate for the loss of this woodland and the four other ancient woodland areas affected by the scheme in the vicinity[27]. (See Figure EC-AWS-005). The planting will be located between Finemere

[26] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

[27] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

Wood and Decoypond Wood and will increase the extent of woodland habitat and the level of connectivity between other ancient woodlands. The compensation areas will be planted at an early stage in construction and also provide flightlines and foraging habitat for bats.

6.7 Woodland opposite Decoypond Wood (CFA 13)

Baseline conditions

6.7.1 An area of approximately 1.4ha of woodland is located parallel to the western boundary of Decoypond Wood. This area was added to Natural England's ancient woodland inventory in 2014 and qualifies as the habitat of principal importance, lowland mixed deciduous woodland. Access restrictions associated with health and safety, due to proximity to an active landfill mean it has not yet been possible to access this woodland to undertake field surveys. However, given its proximity it is considered likely that the habitat resembles that of the 'woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA 12)', as described in Section 6.6 above.

6.7.2 Approximately 0.5ha of the 1.4ha polygon that is shown in Natural England's ancient woodland inventory is situated on the cutting of the Aylesbury Link railway line. This area is unlikely to represent ancient woodland habitat due to the removal of topsoil required for the construction of railway infrastructure. It has therefore been excluded from the extent of ancient woodland shown on Figure EC-AWS-005 and HS2's calculation of ancient woodland losses. HS2 Ltd has informed Natural England of this discrepancy in the ancient woodland inventory, and they have confirmed that they will address it in the next update to the ancient woodland inventory.

Valuation

6.7.3 This readjusted area of woodland (0.9ha) forms part of a resource of ancient woodland in the vicinity of the scheme in the former Bernwood Forest[28] and is considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.7.4 There were no specific measures taken to avoid or reduce the loss of ancient woodland opposite Decoypond Wood. The route of the railway is highly constrained in this location by Sheephouse Wood SSSI to the east, and areas of former landfill site to the south.

Impacts and associated effects

6.7.5 All of the 0.9ha ancient woodland area will be removed for the construction of the rail alignment and the engineering earthworks required for the Calvert cutting, as well as land drainage and bridges. This will result in a permanent adverse effect that will be significant at the county/metropolitan level.

Compensatory measures

6.7.6 Table 23 provides a summary of the compensatory measures that are proposed in response to the expected effects on the woodland opposite Decoypond Wood.

[28] A landscape once owned by the monarch and used largely for deer hunting, still comprising a mosaic of habitats including woodlands.

Table 10: Ancient woodland strategy summary for woodland opposite Decoypond Wood

Woodland	**Woodland opposite Decoypond Wood**
CFA	CFA 13
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.9**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.9**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**24.0 (combined compensation for losses from five ancient woodlands in CFA12 & CFA13)**[29]
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.7.7 Ancient woodland soils from this woodland will be translocated to a receptor site on the northern edge of Decoypond Wood approximately 100m from the affected area (see Figure EC-AWS-005). The receptor area allocated for soils from the Woodland opposite Decoypond Wood is of equal size to the ancient woodland being lost, and forms part of a larger soils receptor area which will also receive material from other nearby affected ancient woodlands. The receptor site is located directly adjacent to the retained ancient woodland at Decoypond Wood and thus aims to reduce the effects of fragmentation on the retained woodland.

Soil conditions

6.7.8 The soils in the affected area of woodland and the receptor site are both described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.7.9 An area of approximately 24ha of woodland planting will be provided to compensate for the loss of this woodland and the four other ancient woodland areas affected by the scheme in the vicinity[29]. (See Figure EC-AWS-005). The planting will be located between Finemere Wood

[29] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

and Decoypond Wood and will increase the extent of woodland habitat and the level of connectivity between other ancient woodlands. The compensation areas will be planted at an early stage in construction and also provide flightlines and foraging habitat for bats.

6.8 Decoypond Wood (CFA 13)

Baseline conditions

6.8.1 Decoypond Wood is ancient semi-natural woodland that qualifies as the habitat of principal importance, lowland mixed deciduous woodland. It is an LWS and the LWS citation notes that the site comprises a mix of wet ash and hazel coppice with oak, birch (*Betula* species) and field maple (*Acer campestre*). The site is understood to support a number of woodland plants including wood sedge (*Carex sylvatica*), three-nerved sandwort (*Moehringia trinervia*), bluebell, primrose and wood millet (*Milium effusum*). It is one of several areas of ancient woodland between Quainton and Calvert that are fragments of the former Bernwood Forest. Decoypond Wood has not yet been subject to survey by HS2 Ltd.

6.8.2 The 2014 updates to Natural England's ancient woodland inventory resulted in a small increase in the extent of recognised ancient woodland at Decoypond Wood, from 8.6ha to 8.9ha. The additional 0.3ha area is entirely situated on the cutting of the Aylesbury Link railway line. It is unlikely to represent ancient woodland habitat due to the removal of topsoil required for the construction of railway infrastructure, and has therefore been excluded from the extent of ancient woodland shown on Figure EC-AWS-005, and HS2 Ltd's calculations of ancient woodland loss. HS2 Ltd has informed Natural England of this discrepancy in the ancient woodland inventory, and they have confirmed that they will address it in the next update to the ancient woodland inventory.

Valuation

6.8.3 Decoypond Wood is designated as a LWS due to the quality of the ancient woodland it contains and is therefore considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.8.4 There have been no specific measures taken to avoid or reduce the loss of ancient woodland at Decoypond Wood. However, measures to reduce or remove impacts will be investigated during detailed design. The route of the railway is highly constrained in this location by Sheephouse Wood SSSI to the east, and areas of former landfill site to the south.

Impacts and associated effects

6.8.5 The construction of the rail alignment and the engineering earthworks and land drainage associated with the eastern bank of the Calvert cutting will result in the removal of approximately 1.1ha (12.5%) of ancient woodland from the western edge of Decoypond Wood (see Figure EC-AWS-005). The loss would result in a permanent adverse effect that is significant at the county/metropolitan level.

6.8.6 Approximately 0.9ha of the 1.1ha of ancient woodland habitat is required solely during the construction of the Scheme. Measures to reduce or remove the area of land required solely during construction will continue to be investigated during detailed design.

Compensatory measures

6.8.7 Table 24 provides a summary of the compensatory measures that are proposed in response to the expected effects on Decoypond Wood.

Table 11: Ancient woodland strategy summary for Decoypond Wood

Woodland	Decoypond Wood
CFA	CFA 13
Status	Ancient semi-natural woodland and Local Wildlife Site

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.1**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**1.1**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**24 (combined compensation for losses from five ancient woodlands in CFA12 & CFA13)**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.8.8 Soils from the affected area of Decoypond Wood will be translocated to a receptor site on the northern edge of the retained area of the woodland (See Figure EC-AWS-005). The receptor area allocated for soils from Decoypond Wood is of equal size to the area of ancient woodland at Decoypond Wood that will be lost as a result of construction, and forms part of a larger soils receptor area which will receive material from other nearby affected ancient woodlands. The receptor site is located directly adjacent to the retained ancient woodland at Decoypond Wood and thus aims to reduce the effects of fragmentation on the retained woodland.

Soil conditions

6.8.9 The soils in the affected area of woodland and the receptor site are both described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.8.10 An area of approximately 24ha of woodland planting will be provided to compensate for the damage to this woodland and the four other ancient woodland areas affected by the scheme in the vicinity[30]. (See Figure EC-AWS-005). The planting will be located between Finemere Wood and Decoypond Wood and will increase the extent of woodland habitat and the level of

[30] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

connectivity between other ancient woodlands. The compensation areas will be planted at an early stage in construction and also provide flightlines and foraging habitat for bats.

6.9 Woodland to the south of Calvert and west of the route (CFA 13)

Baseline conditions

6.9.1 This woodland comprises approximately 0.34ha of ancient semi-natural woodland identified in the 2014 revisions to the ancient woodland inventory. It qualifies as the habitat of principal importance, i.e. lowland mixed deciduous woodland.

6.9.2 NVC surveys undertaken in 2013[31] indicate that the wood could be classified as NVC type ash woodland W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland. The canopy is dominated by pedunculate oak, ash and aspen (*Populus tremula*), the latter being an indicator of ancient woodland. The vegetation layer below the canopy is dominated by hawthorn, while the ground flora contains the ancient woodland indicator species wood anemone and bluebell.

Valuation

6.9.3 This area forms part of a resource of ancient woodland in the vicinity of the scheme in the former Bernwood Forest. It is of limited size, but is considered to be of up to county/metropolitan value.

Measures taken to avoid or reduce impacts

6.9.4 There were no specific measures taken to avoid or reduce the loss of ancient woodland to the south of Calvert west of the route. The route of the railway is highly constrained in this location by Sheephouse Wood SSSI to the north-east, and areas of former landfill site to the south-west.

Impacts and associated effects

6.9.5 The construction of the rail alignment, engineering earthworks required for the western bank of the Calvert cutting, and land drainage (including an attenuation pond) will result in the permanent loss of approximately 0.1ha (32%) of ancient woodland from the eastern edge of this woodland (See Figure EC-AWS-005). The loss would result in a permanent adverse effect that is significant at the county/metropolitan level.

Compensatory measures

6.9.6 Table 12 provides a summary of the compensatory measures that are proposed in response to the expected effects on the woodland to the south of Calvert west of the route.

Table 12: Ancient woodland strategy summary for the woodland to the south of Calvert west of the route

Woodland	Woodland to the south of Calvert west of the route
CFA	CFA 13

[31] HS2 Ltd (2013) Volume 5: Appendix EC-001-002 of the Hybrid Bill Environmental Statement (2013). ES 3.5.2.7-15.1 Volume 5 Technical Appendices CFA7-15: Colne Valley to Lower Boddington Ecological baseline data: designated sites, habitat surveys and flora

Status	Ancient semi-natural woodland

Description	Extent of habitat in category (ha)
Area of direct loss of ancient woodland (ha)	**0.1**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.1**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**24.0 (combined compensation for losses from five ancient woodlands in CFA12 & CFA13)**[32]
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.9.7 Soil material from the affected area of this woodland will be translocated to a receptor site on the northern edge of the retained area of Decoypond Wood (see Figure EC-AWS-005). This area is approximately 490m from the affected woodland and provides direct connectivity with existing ancient woodland and large areas of compensatory planting thus reducing the effects of fragmentation while maintaining the extent of the woodland. The allocated area to receive soils from the Woodland to the south of Calvert west of the route is of equal size to the area of woodland that will be lost(0.1ha), and forms part of a larger soils receptor area which will receive material from other nearby affected ancient woodlands.

Soil conditions

6.9.8 The soils in the affected area of woodland and the receptor site are both described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.9.9 An area of approximately 24ha of woodland planting will be provided to compensate for the damage to this woodland and the four other ancient woodland areas affected by the scheme in the vicinity[33]. (see Figure EC-AWS-005). The planting will be located between Finemere Wood and Decoypond Wood and will increase the extent of woodland habitat and the level of connectivity between other ancient woodlands. The compensation areas will be planted at an early stage in construction and also provide flightlines and foraging habitat for bats.

[32] The 24a of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

[33] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

6.10 Woodland to the south of Calvert and east of the route (CFA 13)

Baseline conditions

6.10.1 The area comprises approximately 0.8ha of ancient semi-natural woodland identified in the 2014 revisions to the ancient woodland inventory. It also qualifies as a habitat of principal importance, i.e. lowland mixed deciduous woodland. This woodland is yet to be subject to field survey by HS2 Ltd.

6.10.2 Approximately 0.2ha of the 0.8ha area as area of ancient woodland within the ancient woodland inventory is situated on railway infrastructure, and has therefore been excluded from the extent of ancient woodland shown on Figure EC-AWS-005, and HS2 Ltd's calculations of ancient woodland loss. This area is unlikely to represent ancient woodland habitat due to the removal of topsoil required for the construction of railway infrastructure. It has been excluded from the extent of ancient woodland shown on Figure EC-AWS-005. HS2 Ltd has informed Natural England of this discrepancy in the ancient woodland inventory, and they have confirmed that they will address it in the next update to the ancient woodland inventory.

Valuation

6.10.3 This area forms part of a resource of ancient woodland in the vicinity of the scheme in the former Bernwood Forest and is therefore considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.10.4 The AP4 amendments included land for an additional overbridge; the Calvert sidings overbridge, for use by landfill traffic. The location of the Calvert sidings overbridge was determined by the need to minimise disturbance from lorry movements to residents of Calvert and of the flightline for bats provided by the Calvert green overbridge. For these reasons it was necessary for Calvert sidings overbridge to be located immediately south of this woodland. In order to reduce habitat loss, the eastern approach to the bridge had been placed outside the boundary of the woodland.

6.10.5 As detailed in Section 5.5, HS2 Ltd is promoting an application for a TWAO to relocate the FCC Waste Services (UK) Ltd. railway sidings to the south of Sheephouse Wood. As a result of this proposed relocation, areas which would have been specifically required for the relocation site for the railway sidings north of Decoypond Wood, as included in the AP4 amendments, would be retained under their existing land uses. Therefore, if the TWAO application is successful, this change to the scheme will reduce the scale of ancient woodland loss by approximately 0.1ha (a 25% reduction) from the woodland to the south of Calvert east of the route.

Impacts and associated effects

6.10.6 The construction of the rail alignment and the engineering earthworks associated with the eastern bank of the Calvert cutting will result in the permanent loss of approximately 0.5ha of ancient woodland from the western edge of this wood. This loss would be a permanent adverse effect that is significant at the county/metropolitan level.

6.10.7 As set out in paragraph 6.10.5 above, if the TWAO application is successful, the extent of ancient woodland loss from this wood would be reduced to approximately 0.4ha (see Figure

EC-AWS-005). Whilst there would be a reduction in ancient woodland loss, the effect would remain significant at the county/metropolitan level.

6.10.8 As the TWAO is yet to be approved the strategy currently assumes the worst-case loss of 0.5ha of ancient woodland from the Woodland to the south of Calvert east of the route.

Compensatory measures

6.10.9 Table 13 provides a summary of the compensatory measures that are proposed in response to the expected effects on the woodland to the south of Calvert east of the route.

Table 13: Ancient woodland strategy summary for the woodland to the south of Calvert east of the route

Woodland	Woodland to the south of Calvert east of the route
CFA	CFA 13
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.5**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.5**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**24.0 (combined compensation for losses from four ancient woodlands in CFA12 & CFA13)**[34]
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.10.10 Material from the affected area of this woodland will be translocated to a receptor site on the northern edge of the retained area of Decoypond Wood (see Figure EC-AWS-005). This area is approximately 450m from the affected woodland and provides direct connectivity with existing ancient woodland and large areas of compensatory planting thus reducing the effects of fragmentation while maintaining the extent of the woodland.

[34] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

6.10.11 The receptor site is of sufficient size for full extent of ancient woodland soils to be translocated to avoid the retention of an unviable fragment of woodland between the route and the Calvert sidings overbridge, if the TWAO application was not successful.

Soil conditions

6.10.12 The soils in the affected area of woodland and the receptor site are both described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.10.13 An area of approximately 24ha of woodland planting will be provided to compensate for the damage to this woodland and the four other ancient woodland areas affected by the scheme in the vicinity[35]. (see Figure EC-AWS-005). The planting will be located between Finemere Wood and Decoypond Wood and will increase the extent of woodland habitat and the level of connectivity between other ancient woodlands. The compensation areas will be planted at an early stage in construction and also provide flightlines and foraging habitat for bats.

6.11 Fox Covert (Whitfield) (CFA14)

Baseline conditions

6.11.1 A review of historic mapping and available field data for Fox Covert (Whitfield) (total area 1.6ha) undertaken by HS2 Ltd in 2014 identified that only approximately 0.6ha of Fox Covert (Whitfield) is likely to be ancient woodland. The woodland is located along the historic parish boundary and has broadly unchanged morphology since 1797, with the exception of a reduction in its northern extent and the 19th century addition at the southernmost extent. The area of likely ancient woodland is in the northern part of the wood and lies outside the land required for the scheme.

6.11.2 Fox Covert (Whitfield) (1.6ha) was identified as ancient semi-natural woodland in the October 2015 revision of the Natural England ancient woodland inventory. However, as reported in Section 3.1 of the SES and AP2 ES Volume 2 – CFA14, a review of available field data and historic mapping undertaken in 2014 identified only 0.6ha is likely to be ancient.

6.11.3 Fox Covert (Whitfield) was subject to NVC survey in 2013[36]. The canopy is dominated by ash, pedunculate oak, field maple and wild cherry (*Prunus avium*) and more rarely Scot's pine (*Pinus sylvestris*). The understorey comprised old hazel coppice and English elm (*Ulmus* species) as well as hawthorn and elder. The ground flora has a total of five ancient woodland indicator species including bluebell, herb Robert and lesser celandine (*Ranunculus ficaria*). It includes a raised boundary embankment.

Valuation

6.11.4 Fox Covert (Whitfield) is an LWS designated for its semi-natural broadleaved woodland and is of county/metropolitan value.

[35] The 24ha of woodland planting provided in this area represents a response to the losses of ancient woodland that will occur at Woodland along the bridleway adjacent to the landfill south-east of Calvert (CFA12), Decoypond Wood (CFA13), Decoypond Wood (CFA13), Woodland to the south of Calvert west of the route (CFA13),and Woodland to the south of Calvert east of the route (CFA13).

[36] HS2 Ltd (2013) Volume 5: Appendix EC-001-002 of the Hybrid Bill Environmental Statement (2013). ES 3.5.2.7-15.1 Volume 5 Technical Appendices CFA7-15: Colne Valley to Lower Boddington Ecological baseline data: designated sites, habitat surveys and flora.

Measures taken to avoid or reduce impacts

6.11.5 In the original scheme design reported in the November 2013 ES the extent of the land required for the construction was narrowed at Fox Covert (Whitfield) to minimise the loss of woodland, and avoid loss of the ancient woodland present in the northern part of the wood.

Impacts and associated effects

6.11.6 Construction of the Brackley south cutting including earthworks and the route alignment, as well as land drainage and bridge construction will remove 0.7ha (39%) of the western part of the wood (see Figure EC-AWS-006). However, the area of likely ancient woodland lies entirely outside the land required for the scheme and will not be affected by the scheme.

Compensatory measures

6.11.7 There is no requirement for compensation for loss of ancient woodland but an area of approximately 0.5ha for planting is provided to compensate for adverse effects on the integrity of the woodland in terms of its designation as an LWS. This area of compensation is not provided in response to losses of ancient woodland and therefore is not included within the habitat creation totals for the ancient woodland strategy.

6.12 Mossycorner Spinney (CFA 14)

Baseline conditions

6.12.1 Mossycorner Spinney contains an area of approximately 0.6ha in area that was recognised as ancient semi-natural woodland in the 2014 revisions to the ancient woodland inventory. It is lowland mixed deciduous woodland, i.e. a habitat of principal importance.

6.12.2 Surveys of the woodland undertaken in 2014, recorded the presence of woodland resembling the NVC W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community. The canopy was dominated by mature ash with a dense understorey of elder with blackthorn (*Prunus spinosa*), hawthorn and garden privet (*Ligustrum ovalifolium*). The ground flora was species-poor and three ancient woodland indicator species were present - wild cherry (*Prunus avium*), black bryony (*Tamus communis*) and blackcurrant (*Ribes nigrum*).

Valuation

6.12.3 The main ES reported that woodland at Mossycorner Spinney was of local/parish value and was unlikely to qualify as a habitat of principal importance. Further habitat survey undertaken since publication of the main ES identified that the area is likely to qualify as habitat of principal importance and local Biodiversity Action Plan (BAP) habitat. In addition, since the main ES the 0.6ha area of the woodland has been formally added to the ancient woodland inventory. In response to these changes the value of woodland at Mosseycorner Spinney was updated in the SES and AP2 ES to recognise that it is of district/borough value. This valuation takes into consideration its limited size and comparative isolation.

Measures taken to avoid or reduce impacts

6.12.4 The original scheme provided for the location of a temporary stockpile approximately 350m long parallel to the route and partially within Mossycorner Spinney. Following the 2014 revision of the ancient woodland inventory, the original scheme would have resulted in the loss approximately 0.3ha of the ancient woodland at Mossycorner Spinney (see Figure EC-

AWS-007). As reported in the SES and AP2 ES, a temporary stockpile of approximately 400m^2 was relocated to another location to avoid the loss of ancient woodland from temporary land take. The AP2 revised scheme therefore reduces the extent of ancient woodland loss by 400m^2 (a 13% reduction).

Impacts and associated effects

6.12.5 Following the incorporation of APs the scheme will remove 0.3ha of semi-natural ancient woodland at Mossycorner Spinney (see Figure EC-AWS-007). This land is required for the Mixbury Embankment, the route alignment and land drainage. This will result in an adverse effect on the conservation status of woodland at Mossycorner Spinney that is significant at the district/borough level.

Compensatory measures

6.12.6 Table 27 provides a summary of the compensatory measures that are proposed in response to the expected effects on Mossycorner Spinney.

Table 14: Ancient woodland strategy summary for Mossycorner Spinney

Woodland	Mossycorner Spinney
CFA	CFA 14
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.3**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.3**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**3.6**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.12.7 Soil material from the affected area of ancient woodland at Mossycorner Spinney will be translocated to a receptor site approximately 200m east of the affected ancient woodland and connected to it by intervening woodland along the Mixbury Brook (see Appendix 1 - Figure 7). It is of equal size to the area of ancient woodland affected at Mossycorner Spinney (0.3ha).

Soil conditions

6.12.8 The soils in the affected area of woodland and both receptor sites are described as 'medium loamy material over lithoskeletal limestone'.

Woodland planting

6.12.9 An area of approximately 3.6ha of planting to compensate for the damage to the ancient woodland at Mossycorner Spinney will be provided split across two areas. One is immediately west of the retained woodland (2.4ha) and the other is along the Mixbury Brook immediately to the east of the receptor site (1.2ha) (see Figure EC-AWS-007).

6.13 Halse Copse South (CFA 15)

Baseline conditions

6.13.1 Approximately 6ha (46%) of Halse Copse South is ancient semi-natural woodland and all of Halse Copse South is lowland mixed deciduous woodland, a habitat of principal importance.

6.13.2 NVC surveys undertaken in 2013[37] indicate that the northern part of the woodland at Halse Copse South is dominated by ash and field maple, with the majority showing affinity to the NVC W8a lowland ash and field maple *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland, *Primula vulgaris - Glechoma hederacea* sub - community. It is botanically rich and is a good example of this habitat. Ten ancient woodland ground flora indicator species are present including bluebell and wood sorrel (*Oxalis acetosella*). The southern part of the wood is dominated by pedunculate oak and is less species-rich.

Valuation

6.13.3 Halse Copse South is a LWS designated for the presence of ancient woodland and associated plants and is therefore considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.13.4 Consultation and further design work in relation to the possible extension of the Greatworth green tunnel was carried out in 2012. A review of options concluded that it was not viable to extend the green tunnel southwards for a variety of engineering and environmental reasons, including the potential for greater land take from Halse Copse South, as well as increased construction and operation costs of the scheme.

Impacts and associated effects

6.13.5 Construction of the Greatworth south cutting and an accommodation overbridge, as well as the route alignment and land drainage, will remove 1.4ha (11%) of habitat at Halse Copse South, of which 0.3ha is ancient woodland (see Figure EC-AWS-008). The majority of habitat removed (approximately 1.1ha) will be from the less botanically rich woodland, which is not ancient. The loss of 0.3ha of ancient woodland will result in a permanent adverse effect that is significant at the county/metropolitan level.

Compensatory measures

6.13.6 Table 28 provides a summary of the compensatory measures that are proposed in response to the expected effects on Halse Copse South.

[37] Volume 5: Appendix EC-001-002 of the Hybrid Bill Environmental Statement (2013). ES 3.5.2.7-15.1 Volume 5 Technical Appendices CFA7-15: Colne Valley to Lower Boddington Ecological baseline data: designated sites, habitat surveys and flora

Table 15: Ancient woodland strategy summary for Halse Copse South

Woodland	Halse Copse South
CFA	CFA 15
Status	Ancient semi-natural woodland and Local Wildlife Site

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.3**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**0.3**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**9.8**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.13.7 Material from the affected area of ancient woodland at Halse Copse South will be translocated to a receptor site adjoining the south-eastern boundary of Halse Copse North, located approximately 550m to the north of the affected ancient woodland (see Figure EC-AWS-007). This is of equal size to the area of ancient woodland at Halse Copse South that will be removed as a consequence of the scheme. The receptor site is located directly adjacent to existing ancient woodland thus reducing the potential effects of fragmentation.

Soil conditions

6.13.8 The soils in the affected area of woodland and receptor site are described as 'clayey chalky drift'.

Woodland planting

6.13.9 The main ES reported that an area of approximately 6ha of lowland mixed deciduous woodland would be provided between Halse Copse South and Halse Copse North to compensate for the loss of 0.3ha of ancient woodland from Halse Copse South. Following discussions with the landowner an alternative location to that proposed in the main ES has been identified.

6.13.10 Instead, compensation habitat will be provided at two locations. One area, 5.5ha in extent, is approximately 325m north-east of Halse Copse South with some connectivity via existing non-ancient woodland and is immediately southeast of the receptor site and the eastern boundary of Halse Copse North (see Figure EC-AWS-008). The other area is situated at Oaks Farm, approximately 9.3km southeast of Halse Copse South, and is approximately 4.3ha in extent (see Figure EC-AWS-007), consisting of adjacent parcels of 3.9ha and 0.4ha. Together

these areas will provide a greater area of compensation habitat than in the ES. This is to account for the distance of some of the compensatory habitat from the affected woodland at Halse Copse South.

6.14 Fox Covert (Glyn Davies Wood) (CFA 15)

Baseline conditions

6.14.1 Fox Covert (Glyn Davies Wood) (3.27ha) is an area of ancient semi-natural woodland and was added to the ancient woodland inventory in October 2015. The woodland qualifies as lowland mixed deciduous woodland, a habitat of principal importance.

6.14.2 It is dominated by ash and pedunculate oak (including several old oak trees), with hazel, honeysuckle (*Lonicera periclymenum*), bramble, hawthorn and elder in the understorey. and bluebell in the ground flora. A number of ancient woodland indicator ground flora species are present including wood meadow-grass (*Poa nemoralis*), field rose and three-nerved sandwort. Field survey identified the woodland as W8 *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland (closest to either *Geranium robertanium* or *Allium ursinum* sub-community, but poorly described by either in the NVC).

Valuation

6.14.3 Fox Covert (Glyn Davies Wood) is a comparatively large and diverse area of woodland. As an uncommon habitat in the wider landscape, it is considered to be of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.14.4 The main ES stated that 1.9ha of non-ancient woodland would be lost from Fox Covert (Glyn Davies Wood).

6.14.5 Following identification that part of Fox Covert (Glyn Davies Wood) is ancient woodland, an AP2 amendment was submitted. This change in scheme design allowed removal of the Stoneton Lane diversion through Fox Covert (Glyn Davies Wood). As such the AP2 amendment reduced the total habitat loss within Fox Covert (Glyn Davies Wood), by 0.6ha to approximately 1. 3 ha.

Impacts and associated effects

6.14.6 Construction of the Boddington cutting and associated land drainage will remove 1.3ha of ancient woodland from the south-western part of Fox Covert (Glyn Davies Wood) (see Figure EC-AWS-009). This loss of ancient woodland will result in a permanent adverse effect that is significant at the county/metropolitan level.

Compensatory measures

6.14.7 Table 16 provides a summary of the compensatory measures that are proposed in response to the expected effects on Fox Covert (Glyn Davies Wood).

Table 16: Ancient woodland strategy summary for Fox Covert (Glyn Davies Wood)

Woodland	Fox Covert (Glyn Davies Wood)
CFA	CFA 15

Status	Ancient semi-natural woodland

Description	Extent of habitat in category (ha)
Area of direct loss of ancient woodland (ha)	**1.3**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0**
Area of receptor site for ancient woodland soils (ha)	**1. 4**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**7.7**
Area of enhancement of existing ancient woodland (ha)	**0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)	**0**

Translocation of ancient woodland soils

6.14.8 Material from the affected area of ancient woodland at Fox Covert (Glyn Davies Wood) will be translocated to a receptor site on the north-western boundary of the remaining part of the wood (see Figure EC-AWS-009)This receptor site is of equal size to the area of the ancient woodland affected by the scheme, and is located directly adjacent to the retained and existing ancient woodland thus reducing the effects of fragmentation while maintaining the extent of the woodland.

Soil conditions

6.14.9 The soils in the affected area of woodland and receptor site are described as 'swelling clayey material passing to clay or soft mudstone'.

Woodland planting

6.14.10 Approximately 7.7ha of woodland planting to compensate for the damage to the ancient woodland at Fox Covert (Glyn Davies Wood) is proposed within a series of planting areas located either side of the alignment (see Figure EC-AWS-009). These areas were selected in order to provide connectivity with the remaining area of ancient woodland and provide woodland corridors either side of the scheme.

6.15 Burnt Firs (CFA 17)

Baseline conditions

6.15.1 Burnt Firs (1.4ha) is an area of broadleaved woodland surrounding an agricultural reservoir, near Burnt Heath Farm. This woodland was not on the ancient woodland inventory in 2012 but was added to the inventory in 2015 as ancient semi-natural woodland.

6.15.2 No survey has been carried out within this woodland due to a lack of access.

Valuation

6.15.3 Burnt Firs was assumed to be of local/parish value in the main ES and loss from this woodland was reported in the main ES Volume 5 Appendix EC-005-003 Register of local/parish level effects (CFA16 to CFA22).

6.15.4 As a result of additional cultural heritage baseline information, the SES (Part 1 of the SES and AP2 ES) identified Burnt Firs as likely to be ancient woodland and its value was increased to district/borough.

Measures taken to avoid or reduce impacts

6.15.5 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Burnt Firs. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.15.6 Review of historic mapping in 2014 identified that Burnt Firs was likely to be ancient woodland. Subsequently, the SES and AP2 ES updated the assessment to recognise the loss of ancient woodland habitat.

6.15.7 Although only 1.1ha of the ancient woodland at Burnt Firs is within the land required to construct the scheme (see Figure EC-AWS-010), the remaining strip of woodland along a farm access track will be smaller in size and more vulnerable to degradation. Therefore, the SES reports a worst-case scenario that the entire 1.4ha area of ancient woodland would be lost as a consequence of the scheme. This would result in a permanent adverse effect on the conservation status of the ancient woodland significant at a district/borough level.

Compensatory measures

6.15.8 Table 17 provides a summary of the compensatory measures that are proposed in response to the expected effects on Burnt Firs Wood.

Table 17.Ancient woodland strategy summary for Burnt Firs Wood

Woodland	Burnt Firs Wood
CFA	17
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	1.1
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	1.2
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	4.7

Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

6.15.9 A receptor area of up to 1.2ha suitable for any soils translocated from the part of Burnt Firs which will be lost as a consequence of the scheme will be provided. This will be between the route and the realigned Welsh Road on map number (see Figure EC-AWS-010).

Soil conditions

6.15.10 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'Slightly acid loamy and clayey soils with impeded drainage'

Woodland planting

6.15.11 Additional compensation in the form of 4.7ha of woodland habitat creation will be provided in the planting area between the route and the realigned Welsh Road currently shown on map number (see Figure EC-AWS-010).The proposed habitat creation area directly adjoins the ancient woodland translocation receptor site for soils from Burnt Firs Wood.

6.16 South Cubbington Wood (CFA 17)

Baseline conditions

6.16.1 South Cubbington Wood is part of the Princethorpe Woods Complex, the largest concentration of semi-natural ancient woodland in Warwickshire, which includes North Cubbington Wood and Western and Waverley Wood. The southern part of South Cubbington Wood, which lies within the land required for the construction of the scheme, supports ash woodland of a type that is locally rare in Warwickshire according to the LWS citation.

6.16.2 The northern portion of South Cubbington Wood (from chainage 135+225 northwards) was subject to NVC survey in 2012 (Main ES Volume 5 Appendix EC-001-003). Following land access NVC surveys were carried out on the central and southern portions of the woodland in 2015(SES and AP2 ES Volume 5 Appendix EC-001-002).

6.16.3 The results of the NVC survey describe South Cubbington Wood as an area of broadleaved native woodland with ash and pedunculate oak as canopy constants. Sessile oak and the non-native Monterey cypress (*Cupressus macrocarpa*) are also canopy constants in the central and southern portions of the woodland respectively. Occasional canopy species include: silver birch, sycamore, aspen, rowan and hornbeam in the northern portion of the woodland; silver birch and field maple in the central portion; and aspen and wild service tree (*Sorbus torminalis*) in the southern portion.

6.16.4 In the northern portion of South Cubbington Wood, hazel coppice is abundant throughout, but hazel growth has been affected by the shaded conditions caused by the closed canopy such that the coppice stools are not densely spaced, and it is easy to walk between them. Other shrubs include common hawthorn, field maple, holly (*Ilex aquifolium*), wild apple (*Malus* species) and blackthorn.

6.16.5 The ground flora is dominated by bluebell throughout, which had receded at the time of the survey. Wood millet is frequent throughout and wood anemone occasional. Yellow archangel

is occasional in the northern portion. Bramble, cleavers, ivy and male fern are also occasionally present. Variegated yellow archangel was recorded within the ground flora in South Cubbington Wood during a Phase 1 survey in May 2012 although this was not noted during the NVC surveys as it is an early growing species. This is a non-native species in Britain listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended), and grows in areas of dense shade and in dry conditions.

6.16.6 In the central and southern portions of South Cubbington Wood, the shrub layer is well developed with hawthorn and hazel as community constants with occasional field rose, bramble (central portion) and wych elm (southern portion). The ground flora is moderately diverse in the central portion, especially along the open rides and paths, which consists of the ancient woodland indicator species including bluebell, wood millet grass, wood anemone and primrose. The ground flora is very diverse in the southern portion, which consists of many ancient woodland indicator species including bluebell, wood millet grass and greater stitchwort.

6.16.7 From observations made during the NVC surveys, the woodland community at South Cubbington Wood as a whole most closely resembles W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix* sub-community (MATCH[38] coefficients of similarity of ~50%). The W8d woodland community is typical of calcareous soils in the lowlands with a dense canopy of ash with pedunculate oak. It is more common on heavy base-rich soils in the south-east of Britain and less common in central Britain. Ivy is dominant in the ground flora due to shading from the canopy and more diverse ground flora is common in open areas along pathways and clearings.

Valuation

6.16.8 South Cubbington Wood (33.6ha) was identified on the ancient woodland inventory in 2012 as PAWS (ancient replanted woodland) and is a Local Wildlife Site (LWS) in Warwickshire. South Cubbington Wood is recognised as lowland deciduous woodland on the Natural England inventory of Habitats of Principal Importance in England identified in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). South Cubbington Wood is of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.16.9 Cubbington retaining wall will reduce the land required for the construction of the scheme, and construction access will be restricted to the western side, with the haul route running outside the wood, to further reduce loss of ancient woodland habitat.

6.16.10 The retaining wall is adjoined on either side of the alignment by strips of ancient woodland that area located within the land identified as required for the scheme. These strips of woodland (0.7ha and 0.8ha in area - see Figure EC-AWS-011)) will be retained, but will subject to woodland edge management as required in order to ensure any risk of trees falling onto the adjacent railway and access roads is minimised.

[38] MATCH is a computer programme developed to aid the assignment of vegetation data to the communities and sub-communities of the National Vegetation Classification (NVC).

Impacts and associated effects

6.16.11 Loss of 2.0ha of broadleaved woodland habitat within South Cubbington Wood was reported in the main ES (see Figure EC-AWS-011).

6.16.12 The remaining woodland on either side of the route will be smaller in size and more vulnerable to degradation through edge effects, such as encroachment of scrub and wind throws during storms. The impacts were reported in the main ES to result in a permanent adverse effect on the conservation status of the ancient woodland that will be significant at a country/metropolitan level.

Compensatory measures

6.16.13 Table 18 provides a summary of the compensatory measures that are proposed in response to the expected effects on South Cubbington Wood

Table 18: Ancient woodland strategy summary for South Cubbington Wood

Woodland	South Cubbington Wood
CFA	17
Status	PAWS (ancient replanted woodland) and Local Wildlife Site.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	2.0 (all PAWS)
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	1.5
Area of receptor site for ancient woodland soils (ha)	2.0
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	6.7
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

The receptor site for ancient woodland soils is 2.0ha in size and is located approximately 160m north-east of the donor site. The receptor site has been chosen to create a woodland link between North Cubbington Wood and Weston Wood, whilst retaining the degraded rush pasture in the southern part of Waverley and Weston Woods LWS (see Figure EC-AWS-011).

Soil conditions

6.16.14 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'.

Woodland planting

6.16.15 Since submission of the Bill, in response to petitions and considerations in the Select Committee, a requirement was identified to reconfigure the large area of woodland habitat creation adjacent to South Cubbington Wood in order to reduce the impact on agricultural land at Weston Hall Farm. This was introduced as part of the AP4 revised scheme as amendment AP4-017-004 and comprised changes to the woodland habitat creation area adjacent to South Cubbington Wood, along the HS2 route and adjacent to the River Leam.

6.16.16 The area of woodland planting associated with the AP4 revised scheme is reported in the SES3 and AP4 ES as 8.85ha (this included the 2ha area that will be utilised as an ancient woodland receptor) (see Figure EC-AWS-011). Recent updates to the scheme GIS database have increased the accuracy of the figures reported in the SES and AP2 ES and the additional area of habitat creation will be approximately 6.7ha(see Figure EC-AWS-011). The area of new woodland planting remains more than twice the area of South Cubbington Wood lost to the scheme.

6.16.17 The reconfigured woodland planting will create greater north-south woodland habitat connectivity between South Cubbington Wood and the River Leam in a relatively open agricultural landscape.

6.16.18 This will allow the land parcels with a combined area of approximately 5.2ha between North Cubbington Wood and Western and Waverley Wood to be used for the creation of woodland links along field boundaries and for improving the degraded rush pasture within Waverley and Weston Woods LWS.

6.17 Unnamed woodland south of the B4115 Ashow Road in Stoneleigh (CFA 18)

Baseline conditions

6.17.1 The woodland is bounded alongside the B4115 Ashow Road by a common hawthorn hedge and by an old sunken lane to the south. About 250m long, the maximum width of the woodland is 45m at the western extremity, narrowing to 20m at the eastern end.

6.17.2 Three quadrats were surveyed in 2012 using the NVC methodology in the less disturbed western section of the woodland (Main ES Volume 5 Appendix EC-001-003). The canopy consists of ancient, tall oak with ash, birch, beech and wych elm (the latter much diseased), together with planted copper beech and grey poplar. Much of the understorey is overrun by rhododendron (*Rhododendron ponticum*) and bracken (*Pteridium aquilinum*). Several ancient indicator species were also recorded including holly, wood millet, native bluebell, yellow pimpernel, remote sedge and three-nerved sandwort.

6.17.3 The NVC community type is intermediate between W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* and W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis*.

Valuation

6.17.4 This woodland was identified as being of local/parish value in the main ES.

6.17.5 Following additional cultural heritage baseline information collected in 2014 the SES (Part 1 of the SES and AP2 ES) identified the woodland as ancient its value was updated to district/borough.

Measures taken to avoid or reduce impacts

6.17.6 The SES3 and AP4 ES reported an amendment to the scheme which reduces the loss of ancient woodland from 0.6ha to 0.2ha (a 67% reduction) by reducing the land required for construction (AP4-018-002) (see Figure EC-AWS-012). The AP4 amendments also added a new woodland habitat creation area to the scheme, close to a revised access track to the balancing pond at Ashow Road, adjacent to the retained woodland.

Impacts and associated effects

6.17.7 An area of 0.2ha of ancient woodland will be removed where the scheme cuts through the woodland (see Figure EC-AWS-012). This has been assessed as an adverse residual effect significant at the district/borough level. Consequently, the remaining sections of the ancient woodland either side of the railway will be more vulnerable to degradation through edge effects.

Compensatory measures

6.17.8 Table 19 provides a summary of the compensatory measures that are proposed in response to the expected effects on unnamed woodland south of the B4115 Ashow Road in Stoneleigh

Table 19: Ancient woodland strategy summary for unnamed woodland south of the B4115 Ashow Road in Stoneleigh

Woodland	Unnamed woodland south of the B4115 Ashow Road in Stoneleigh
CFA	CFA 18
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	0.2
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	0.2
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.2
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

6.17.9 A translocation receptor area of 0.2ha for any suitable soils from the woodland has been identified within the ecological mitigation area adjacent to the B4115 Ashow Road and the access track to the balancing pond (see Figure EC-AWS-012)..

Soil conditions

6.17.10 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'slightly acid loamy and clayey soils with impeded drainage.

Woodland planting

6.17.11 Compensation in the form of 0.2ha of woodland habitat creation will also be provided adjacent to the B4115 Ashow Road and the access track to the balancing pond (see Figure EC-AWS-012) .

6.18 Crackley Wood North, including Crackley Wood North Extension (CFA 18)

Baseline conditions

6.18.1 Crackley Wood North (20ha) is ancient semi-natural woodland and is part of Crackley Wood LWS.

6.18.2 The northern part of this habitat is open woodland and there is a residential property that links this with Birches Wood. To the east and west of the wood is arable land. Crackley Wood North is used by the University of Warwick and some small temporary buildings (shed, marquee) are evident.

6.18.3 NVC surveys of the woodland were carried out in 2012 (Main ES Volume 5 Appendix EC-001-003). The woodland community is characterised by a closed canopy of pedunculate oak and silver birch, which are frequent throughout. There is a stand of sycamore in the west of the site and alder is occasional in the south-east of the site. Sweet chestnut (*Castanea sativa*), beech, downy birch, rowan and some exotics are also present at low abundance. The shrub layer is very dense in the central and eastern parts of the site, with hazel coppice dominating. Common hawthorn is only occasionally found, along with elder, rowan and holly. Ash seedlings and saplings are frequent.

6.18.4 Bluebell is abundant in the ground flora and yellow archangel is locally abundant in some areas where it forms patches of sprawling plants. Bramble is frequent, suppressed by the dense shading. Other species occasionally found include creeping soft-grass (*Holcus mollis*), male fern, broad buckler-fern, three-nerved sandwort, honeysuckle, wood sorrel, wood millet and enchanter's nightshade (*Circaea lutetiana*).

6.18.5 This woodland community is W10a *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, typical sub-community, widespread within established woodlands on the base-poor soils of lowland Britain. Analysis of the samples set with MATCH gave a coefficient of similarity for W10a of 63%.

6.18.6 Woodland directly adjacent to Crackley Wood North is shown on historic maps as part of a larger ancient woodland block; this is also indicated by the woodland flora identified during NVC surveys in 2012. In the ES documents) this woodland was included as part of Birches

Wood. However, for the purposes of this strategy, we have renamed this area of woodland as Crackley Wood North Extension (see Figure EC-AWS-013) as it is more logically part of Crackley Wood North than Birches Wood. Crackley Wood North Extension is not on either the 2012 or 2015 ancient woodland inventory.

Valuation

6.18.7 Crackley Wood North, including Crackley Wood North Extension is an area of ancient woodland valued at county/metropolitan level.

Measures taken to avoid or reduce impacts

6.18.8 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Crackley Wood North, including Crackley Wood North Extension. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.18.9 Loss of 0.1ha of ancient woodland from Crackley Wood North was reported in the main ES, resulting in an adverse effect on the conservation of ancient woodland that will be significant at a county/metropolitan level. Following further review of historic mapping it is now believed that approximately a 1.0ha area is ancient woodland (see Figure EC-AWS-012). While this area has not yet been added to the ancient woodland inventory, this area is assumed to be ancient. This remains an adverse effect significant at the county/metropolitan level.

Compensatory measures

6.18.10 Table 20 provides a summary of the compensatory measures that are proposed in response to the expected effects on Crackley Wood North, including Crackley Wood North Extension

Table 20: Ancient woodland strategy summary for Crackley Wood North, including Crackley Wood North Extension

Woodland	Crackley Wood North, including Crackley Wood North Extension
CFA	18
Status	Ancient semi-natural woodland.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.0**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**1.0**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.9 (also for Birches Wood)**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.18.11 The main ES stated that ancient woodland soil from Broadwells Wood, Crackley Wood North and Roughknowles Wood with its associated seed bank will be carefully removed and translocated to an area within a 2.3ha ecological mitigation area which will link the retained southern area of Broadwells Wood with Crackley Wood via woodland along the Kenilworth Greenway. This will increase the connectivity of fragmented ancient woodland parcels.

6.18.12 Ancient woodland soils from both Crackley Wood and the Crackley Wood North Extension Area (total combined loss of approximately 1.0ha) will now be translocated to the 1.6ha receptor site adjacent to the retained section of Crackley Wood (see Figure EC-AWS-013). As noted in Table 6 ancient woodland soils from Birches Wood will also be translocated here. This allows ancient woodland soils to be relocated adjacent to those areas being retained and will reduce transport time and distance.

Table 21: Summary of losses and compensation for Crackley Wood North, Crackley Wood North Extension and Birches Wood

Woodland	**Extent of loss (ha)**	**Soil receptor area provision (ha)**	**Woodland compensation area provision (ha)**
Crackley Wood North, including Crackley Wood North Extension	1.0	1.6	0.9
Birches Wood	0.6		
Total	**1.6**	**1.6**	**0.9**

Soil conditions

6.18.13 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'freely draining slightly acid loamy soils'

Woodland planting

6.18.14 In addition to the soil translocation area, a 0.9ha woodland compensation area will be provided adjacent to Crackley Wood North (see Figure EC-AWS-013). This area of compensation planting is provided in response to losses at both Crackley Wood North (including Crackley Wood North Extension) and Birches Wood.

6.19 Birches Wood (CFA 18)

6.19.1 As described in section 6.18 above, Crackley Wood North, including Crackley Wood North Extension and Birches Wood are very close together and some of the habitat creation provided provides compensation in lieu of the expected effects on both of these woodlands.

Baseline conditions

6.19.2 NVC surveys carried out in 2012 (Main ES Volume 5 Appendix EC-001-003) recorded a canopy dominated by pedunculate oak, with occasional alder and downy birch. Coppiced hazel is the most abundant species in the shrub layer, although there is no sign of recent management. Common hawthorn and elder are frequent shrubs, and there is occasional grey willow, holly, blackthorn and field maple.

6.19.3 In the ground flora, bramble is abundant and locally dominant, with native bluebell also abundant. Yellow archangel is locally abundant. Other species that are prominent include enchanter's nightshade, ground ivy, creeping soft-grass, rough meadowgrass, broad buckler-fern, common nettle, cleavers, red campion and wood avens. Wood millet, wood anemone, dog's mercury and thin-spiked wood-sedge are present at low abundance.

6.19.4 This woodland community is W10a *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, typical sub-community. MATCH gave a poor coefficient of similarity for this sub-community, but it was determined in the field to be W10a, due to the assemblage of species present.

Valuation

6.19.5 Birches Wood has been assessed as being of district/borough value.

6.19.6 The SES (SES and AP2 ES Volume 2 CFA18) confirmed the woodland as ancient, as a result of additional cultural heritage baseline information, but the value of the woodland did not change.

Measures taken to avoid or reduce impacts

6.19.7 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Birches Wood. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.19.8 The entirety of Birches Wood (approximately 0.6ha) will be lost as a result of the construction of the scheme (see Figure EC-AWS-013). This has been assessed as an adverse effect significant at the district/borough level.

Compensatory measures

6.19.9 Table 22 provides a summary of the compensatory measures that are proposed in response to the expected effects on Birches Wood.

Table 22: Ancient woodland strategy summary for Birches Wood

Woodland	Birches Wood
CFA	18
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.6**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.6**

Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.9 (**also for Crackley Wood North (including Crackley Wood North Extension)
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.19.10 The 1.6ha soil translocation receptor site adjacent to Crackley Wood North (map number XX Figure: 13) will receive any suitable soils from both Crackley Wood North, Crackley Wood North Extension (combined soils of up to 1.0ha) and Birches Wood (up to 0.6ha) (see Figure EC-AWS-013).

Soil conditions

6.19.11 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'freely draining slightly acid loamy soils'.

Woodland planting

6.19.12 An area of woodland habitat creation of approximately 0.9ha will also be provided adjacent to Crackley Wood North. This area of compensation planting is provided in response to losses at both Crackley Wood North (including Crackley Wood North Extension) and Birches Wood.

6.20 Roughknowles Wood (CFA 18)

Baseline conditions

6.20.1 Roughknowles Wood (5ha) is identified on the ancient woodland inventory as mainly ancient replanted woodland with a small strip of semi-natural ancient woodland on its northern edge.

6.20.2 NVC surveys carried out in 2012 (Main ES Volume 5 Appendix EC-001-003) recorded that past management and the actions of the pigs that have been grazed in this woodland have resulted in a marked contrast between Roughknowles Wood, Birches Wood and Crackley Wood North. The canopy is dominated by frequent but scattered pedunculate oak with dense growth of young downy birch and locally frequent young Scots pine. Wild cherry is prominent locally, in stands derived from suckering old trees. Ash and sycamore are present but rare at the site. Young birch, pine and oak form a shrub layer, with hazel occasionally present, and rowan, holly and hawthorn very occasionally found.

6.20.3 The ground flora is distinctive due to the dominance of foxglove in large patches (presumably due to the grazing out of other species by pigs). Bracken is locally dominant where pigs have been excluded. Native bluebell is present throughout, although not dominant, and bramble, red currant, three-nerved sandwort, red campion and wood millet are frequent.

6.20.4 This woodland community is a modified form of W10a *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, typical sub-community. MATCH gave a high coefficient of similarity of 54% for this sub-community.

6.20.5 A desk study record of orpine, a tall stonecrop and a Warwickshire scarce species, was identified in Roughknowles Wood at the junction of Cryfield Grange Lane and Crackley Lane.

This plant is only known to occur in two sites in Warwick District. The presence of this plant was not confirmed during surveys.

Valuation

6.20.6 Roughknowles Wood has been assessed as being of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.20.7 Land required within Roughknowles Wood was minimised by aligning local road diversions to reduce land required for the Scheme.

6.20.8 The SES3 and AP4 ES introduced a number of changes to woodland compensation proposals in CFA18 (SES and AP4 ES Volume 2 CFA 18). The original soils receptor area mentioned in the main ES has been changed and an area adjacent to the retained section of Roughknowles Wood has now been identified as a more suitable receptor area for up to 0.4 ha of soils associated with the loss of 0.4ha of Roughknowles Wood (see Figure EC-AWS-013). This will allow ancient woodland soils to be adjacent to those areas being retained and will reduce transport time and distance. This area will also be utilised for the translocation of orpine

Impacts and associated effects

6.20.9 Loss of 0.5ha of replanted ancient woodland (PAWS) from Roughknowles Wood was reported in the main ES. The impacts were reported to result in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

6.20.10 Based on recent recalculations the area of Roughknowles Wood that will be lost has been more accurately measured as approximately 0.4ha (see Figure EC-AWS-013). This remains a permanent adverse effect on the woodland significant at the county/metropolitan level.

Compensatory measures

6.20.11 Table 23 provides a summary of the compensatory measures that are proposed in response to the expected effects on Roughknowles Wood.

Table 23: Ancient woodland strategy summary for Roughknowles Wood

Woodland	Roughknowles Wood
CFA	18
Status	Mainly ancient replanted woodland with a small strip of semi-natural ancient woodland on the northern edge

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	0.4 (all PAWS)
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	0.4
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.6
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

6.20.12 An area adjacent to the retained section of Roughknowles Wood has now been identified as a more suitable receptor area for the loss of 0.4ha of Roughknowles Wood (see Figure EC-AWS-013). This will allow ancient woodland soils to be adjacent to those areas being retained and will reduce transport time and distance. This area will also be utilised for the translocation of orpine.

Soil conditions

6.20.13 The soil conditions at the ancient woodland donor area is classified in the southern section as 'Freely draining slightly acid loamy soils' and in the northern part as 'Slightly acid loamy and clayey soils with impeded drainage'. The soil conditions at the receptor site are classified as 'Freely draining slightly acid loamy soils'.

Woodland planting

6.20.14 A 0.6ha area of woodland habitat creation will also be provided adjacent to the retained part of Roughknowles Wood as compensation for loss of this woodland. Landscape planting (woodland and scrub) and hedgerows will be provided within this area and will improve woodland links between the retained sections of Crackley Wood, Roughknowles Wood and Broadwells Wood (see Figure EC-AWS-013).

6.21 Broadwells Wood (CFA 18)

Baseline conditions

6.21.1 Broadwells Wood (15.6ha) is identified on the ancient woodland inventory, and contains both areas of semi-natural ancient woodland and PAWS. It is located between Crackley Wood and

the village of Burton Green. It is a LWS in Warwickshire, and supports lowland mixed deciduous woodland, a Habitat of Principal Importance.

6.21.2 Broadwells Wood comprises mature standards of pedunculate oak, birch and ash, together with some conifers and sycamore, over an understorey of hazel coppice, holly and common hawthorn.

6.21.3 The woodland appears to have been felled during the Second World War, as indicated on aerial photographs from 1945. It is likely that the woodland was planted with stands of broadleaved trees and conifers after this period. An area of 1.5ha has been cleared recently and replanted with oak, ash and cherry along the north-western edge. There is evidence of pheasant rearing (old pheasant pens) and shooting (a high seat), the latter of which is likely to have been the reason for the removal of a certain amount of the understorey vegetation.

6.21.4 The woodland canopy is composed of pedunculate and ash standards. Planted Scots pine, Norway spruce, common larch (*Larix decidua*), sweet chestnut and sycamore are also present. The main woodland community is W10a *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, typical sub-community, which has bluebell, bracken and bramble dominant in the field layer (with a MATCH coefficient of 53%). Immediately adjacent to the streams, ponds and wetter depressions, the vegetation is influenced by moister and more base-rich conditions with abundant tufted hair-grass and lesser celandine, and occasional patches of wood anemone, opposite-leaved golden-saxifrage, enchanter's nightshade, common marsh-bedstraw and cuckoo flower.

6.21.5 This woodland community is W8b *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Anemone nemorosa* sub-community. The wood anemone sub-community (W8b) generally has a south-easterly distribution in Britain, common on heavy base-rich soils, but is less common and more scattered in distribution in Warwickshire, the Midlands and north-west Britain.

Valuation

6.21.6 Broadwells Wood has been assessed as having a conservation status significant at the county/metropolitan level.

Measures taken to avoid or reduce impacts

6.21.7 Changes to the scheme brought forward in the SES and AP2 ES, mean that an area of approximately 0.7ha of ancient woodland located within the Hybrid Bill limits will now be retained and not utilised or otherwise directly impacted during either construction or operation (see Figure EC-AWS-014)

Impacts and associated effects

6.21.8 Loss of approximately 2.8ha of ancient semi-natural woodland and 0.4ha of replanted ancient woodland was reported in the main ES, a total of 3.2ha. However, recent updates to the scheme GIS database has increased the accuracy of the figures previously reported and the expected loss of ancient woodland at Broadwell Wood is now expected to be approximately 3.6ha (see Figure EC-AWS-014). The retained sections will be fragmented by the scheme. While the area of woodland affected is slightly larger than that which was reported in the main ES this remains a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

Compensatory measures

6.21.9 Table 24provides a summary of the compensatory measures that are proposed in response to the expected effects on Broadwells Wood.

Table 24: Ancient woodland strategy summary for Broadwells Wood

Woodland	Broadwells Wood
CFA	18
Status	Ancient semi-natural woodland and areas of plantation on ancient woodland, both part of a Local Wildlife Site.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	3.6 (including 0.4ha PAWS)
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.7
Area of receptor site for ancient woodland soils (ha)	3.3
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	5.7
Area of enhancement of existing ancient woodland (ha)	8.3 (enhancement of Black Waste Wood as compensation for a variety of impacts on ancient woodland within CFA18[39]
Area of enhancement of existing non-ancient woodland (ha)	0.0

Translocation of ancient woodland soils

6.21.10 Amendments brought forward in the SES3 and AP4 ES resulted in a change to the proposed receptor site for ancient woodland soils. Two receptor sites are now identified: one (2.6ha) adjacent to retained areas of Broadwells Wood and the other (0.7ha) adjacent to a woodland planting area along the Kenilworth Greenway (see Figure EC-AWS-014). This amendment will link the retained southern area of Broadwells Wood with Crackley Wood North, and Crackley Wood Extension via woodland along the Kenilworth Greenway.

Soil conditions

6.21.11 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'Slightly acid loamy and clayey soils with impeded drainage'.

[39] 8.3ha of existing ancient woodland at Black Waste Wood forms part of a wider compensation strategy for ancient woodland losses in CFA18 in response to losses at Black Waste Wood, Little Poors,

Woodland planting

6.21.12 A minimum of 5.7ha of woodland habitat creation will also be provided in this same area between the Kenilworth Greenway and the route as compensation (see Figure EC-AWS-014). This area consists of two areas of planting: an area of approximately 5.1ha to the south of the alignment, and an area of approximately 0.6ha to the north of the alignment.

Enhancement of ancient woodland

6.21.13 To compensate for the reduction in habitat creation areas near Broadwells Wood, an area of 8.3ha of existing woodland at Black Waste Wood (this area was recorded as 8.7ha in the SES3 and AP4 ES but based on updates to scheme mapping only 8.3ha is considered suitable for woodland enhancement) will be subject to woodland management and enhancement. This measure is provided as compensation for losses to several woodlands in CFA18 that have been added to the ancient woodland inventory since the main ES. The management and enhancement will include measures such as the removal of invasive plant species, for example rhododendron, and management of deadwood habitat and trees for the benefit of wildlife, particularly invertebrates and bats.

6.22 Black Waste Wood (CFA 18)

Baseline conditions

6.22.1 Only part of Black Waste Wood was identified on the ancient woodland inventory as semi-natural ancient woodland during the production of the main ES in 2012/2013. Following a review of historic mapping in 2014 the area recognised as ancient semi-natural woodland increased, with these areas added to the ancient woodland inventory in October 2015.

6.22.2 Black Waste Wood is located east of Burton Green and north of the Kenilworth Greenway. The main woodland site slopes gently towards the south-east, bounded by the gardens of houses in Burton Green to the west, and by arable fields and pasture along the northern and eastern perimeters. A small stream runs through the lower (southern) part of the site, and there are minor wood banks running along parts of the eastern boundary.

6.22.3 Black Waste Wood supports lowland mixed deciduous woodland, a Habitat of Principal Importance. NVC surveys were carried out in 2012 and 2013 (Main ES Volume 5 Appendix EC-001-003) due to different land parcels being accessible in different years. The surveys recorded the main body of Black Waste Wood has having a canopy of pedunculate oak, silver birch, downy birch and rowan, with an understorey of holly, common hawthorn, hazel and honeysuckle. The most abundant species are bramble, ivy, and native bluebell, the latter being very abundant. Yellow archangel is locally prominent, forming patches; and bracken is very abundant under the open birch canopy in the north of the compartment.

6.22.4 There appears to have been little recent management. Non-native invasive plant species are present within the woodland, including rhododendron. There were occasional signs of grazing, and muntjac deer (*Muntiacus reevesi*) were seen. Areas adjacent to the housing have been disturbed and clearings made, and part of the site, adjacent to the north-west ownership boundary, has been replanted with pine. The part of the LWS within the land required for construction of the original scheme has been partially clear felled and used for horse grazing. Many of the open cleared areas are dominated by bracken.

6.22.5 This woodland community is primarily W10c *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Hedera helix* sub-community (with a MATCH coefficient of similarity of 64%), which is present where there is a closed canopy. It is likely that this grades to W10d *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, Holcus lanatus sub-community in the north of the compartment where it joins the greater part of Black Waste Wood. These sub-communities are variations of the typical sub-community, widespread on base-poor soils in the British lowlands, and relatively common where traditional woodland management is no longer undertaken.

Valuation

6.22.6 Part of Black Waste Wood was identified as being included on the ancient woodland inventory in the main ES.

6.22.7 The whole of Black Waste Wood, including a section along Red Lane, was identified as potential ancient woodland in the SES (Part 1 of the SES and AP2 ES) as a result of additional cultural heritage baseline information. As the whole of Black Waste Wood was collectively valued in the main ES as of county/metropolitan value, the valuation did not change within the SES.

Measures taken to avoid or reduce impacts

6.22.8 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Little Poors Wood. To avoid impacting local residents in the Burton Green area, the Greenway was used for the alignment of the route. As such, the route of the railway is constrained in this location and it was not possible to implement measures to avoid or reduce impacts to Black Waste Wood.

Impacts and associated effects

6.22.9 The loss of woodland habitat was reported in the main ES although none of this loss was from woodland that was identified as ancient reported within the main ES.

6.22.10 Following review of historic mapping the SES and AP2 ES updated the assessment reported in the main ES, and identified that the scheme was expected to result in the loss of 1.4ha of ancient woodland at Black Waste Wood. This was assessed as an adverse effect significant at the county/metropolitan level.

6.22.11 Since publication of the SES and AP2 ES Black Waste Wood has been added to the ancient woodland inventory. However, based on further review of field data and aerial photography, the area identified in the inventory as ancient has been reduced to exclude areas of habitat along the north western boundary that show evidence of previous clearance. As a consequence, the loss of ancient woodland at Black Waste Wood is now expected to be 0.6ha, this is a 0.8ha reduction on that stated within the SES and AP2 ES (see Figure EC-AWS-015). This remains an adverse effect significant at the county/metropolitan level.

Compensatory measures

6.22.12 Table 25 provides a summary of the compensatory measures that are proposed in response to the expected effects on Black Waste Wood.

Table 25: Ancient woodland strategy summary for Black Waste Wood

Woodland	Black Waste Wood
CFA	18
Status	Part of Black Waste Wood has been identified as ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	0.6
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	0.0
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.2
Area of enhancement of existing ancient woodland (ha)	8.3 (enhancement of Black Waste Wood as compensation for a variety of impacts on ancient woodland within CFA18[40]
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

*This includes enhancement for Little Poors Wood

Translocation of ancient woodland soils

6.22.13 No translocation of ancient woodland soil is proposed for Black Waste Wood, as the quality of woodland being affected is too low to justify translocation, in particular due to a dense cover of rhodendron making the soil unsuitable for translocation.

Soil conditions

6.22.14 The soil conditions at Black Waste Wood are classified as 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'.

Woodland planting

6.22.15 Wood planting comprises a 0.2ha of woodland habitat creation adjacent to the retained part of Black Waste Wood (see Figure EC-AWS-015).

[40] 8.3ha of existing ancient woodland at Black Waste Wood forms part of a wider compensation strategy for ancient woodland losses in CFA18 in response to losses at Black Waste Wood, Little Poors,

Enhancement of ancient woodland

6.22.16 An 8.3ha[41] area of retained ancient woodland at Black Waste Wood will be subject to woodland management and enhancement (see Figure EC-AWS-015). This measure is provided as compensation for losses to several areas of woodlands in CFA18 that have been added to the ancient woodland inventory since the main ES (including Black Waste Wood itself). The management and enhancement will include measures such as the removal of invasive plant species such as rhododendron, and management of dead wood habitat and trees for the benefit of wildlife, particularly invertebrates and bats.

6.23 Little Poors Wood (CFA 18)

Baseline conditions

6.23.1 Little Poors Wood was not included on the ancient woodland inventory in 2012. Little Poors Wood appears on the ancient woodland inventory in October 2015 as ancient semi-natural woodland. Little Poors Wood forms one half of Little Poors and Big Poors Wood LWS.

6.23.2 Little Poors Wood is a small deciduous woodland of 1.4ha located at Burton Green, Warwickshire. The woodland supports lowland mixed deciduous woodland, a Habitat of Principal Importance. NVC surveys carried out in 2013 (Main ES Volume 5 Appendix EC-001-003) recorded a canopy of mature pedunculate oak (up to 25m in height) with occasional silver birch. In the understorey, neglected hazel coppice is locally dominant with occasional rowan. The shrub layer is well developed and consists of bramble, common hawthorn, Midland hawthorn, elder and occasional holly. There are some clearings dominated by bracken and replanted with young trees. The ground flora is well developed but limited to a few species indicative of acidic ground conditions including bracken, broad buckler-fern, creeping soft-grass and bluebell.

6.23.3 A pond within the woodland is 90% shaded by trees and scrub. Floating sweet grass (*Glyceria fluitans*) is dominant within the pond and remote sedge (*Carex remota*) and mosses are found on the edges of the pond.

6.23.4 The woodland community is W10c *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Hedera helix* sub-community (with a MATCH coefficient of similarity of 57%), a sub-community typical of unmanaged woodland, and widespread in the British lowlands.

Valuation

6.23.5 Little Poors Wood was not identified as ancient woodland in the main ES. The woodland habitat was valued at district/borough level.

6.23.6 As a result of additional cultural heritage baseline information Little Poors Wood was identified as ancient woodland within the SES (Part 1 of the SES and AP2 ES) although the value of the woodland did not change.

Measures taken to avoid or reduce impacts

6.23.7 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Little Poors Wood. To avoid impacting local residents in the Burton Green area, the Greenway

[41] This area was recorded as 8.7ha in the SES3 and AP4 ES but based on updates to scheme mapping only 8.3ha is considered suitable for woodland enhancement

was used for the alignment of the route. As such, the route of the railway is constrained in this location and it was not possible to implement measures to avoid or reduce impacts to Little Poors Wood.

Impacts and associated effects

6.23.8 The scheme will result in the loss of a strip of land from Little Poors Wood that is required for the Burton Green Tunnel (approximately 0.2ha) (see Figure EC-AWS-015). This is expected to result in an adverse effect on the conservation status of the ancient woodland at Little Poors Wood that is significant at a district/borough level.

Compensatory measures

6.23.9 Table 26 provides a summary of the compensatory measures that are proposed in response to the expected effects on Little Poors Wood.

Table 26: Ancient woodland strategy summary for Little Poors Wood

Woodland	Little Poors Wood
CFA	20
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	0.2
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	0.0
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.0
Area of enhancement of existing ancient woodland (ha)	8.3 (enhancement of Black Waste Wood as compensation for a variety of impacts on ancient woodland within CFA18
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

*This includes enhancement for Black Waste Wood

Translocation of ancient woodland soils

6.23.10 Given that a very small area of the poor quality woodland edge at Little Poors Wood will be lost, translocation of soils will be inappropriate, and is not proposed.

Woodland planting

6.23.11 No woodland planting is proposed in response to the losses of ancient woodland at Little Poors.

Enhancement of ancient woodland

6.23.12 The SES3 and AP4 ES introduced a number of changes to woodland compensation proposals in CFA18 (SES3 and AP4 ES Volume 5 AP4-018-004). Under the AP4 revised scheme 11ha of Black Waste Wood was included within the land required for management and enhancement of the woodland habitat to address the additional loss of ancient woodland in CFA18 (see Figure EC-AWS-015).

6.23.13 Mitigation to offset the loss of this woodland involves the management and enhancement of 8.3ha of Black Waste Wood. This measure is provided as compensation for losses to several areas of woodlands in CFA18 that have been added to the ancient woodland inventory since the main ES (including Little Poors). This will include measures such as the removal of invasive plant species, for example rhododendron, and management of deadwood habitat and trees for the benefit of wildlife, particularly invertebrates and bats (see Figure EC-AWS-015)).

Enhancement of non-ancient woodland

6.23.14 No enhancement of non-ancient woodland is required as compensation for works at Black Waste Wood.

6.24 Sych Wood (CFA 20)

Baseline conditions

6.24.1 Sych Wood (4.4ha) is ancient semi-natural woodland and is also an LWS (part of Hams Hall Woodlands LWS). This woodland is recognized as lowland deciduous woodland, a Habitat of Principal Importance.

6.24.2 Hams Hall Woodlands LWS is made up of three component woodlands; Sych Wood, Hams Lane Woodland and Church Pool Covert. The three woodlands are relatively mature with a reasonable range of species typical of oak woodland and wet woodland communities. The LWS lies within the Tame Valley corridor, with the only other similar habitat in the district being Dunton Wood LWS, 1km north-west of Hams Hall Woodlands LWS.

6.24.3 The woodlands have not been surveyed due to access restrictions.

Valuation

6.24.4 Sych Wood has been assessed as having a conservation value significant at the county/metropolitan level. This is considered a 'reasonable worst case' assessment in the absence of survey information given that the site forms part of an LWS.

Measures taken to avoid or reduce impacts

6.24.5 Compensation within the main ES included translocation of ancient woodland soil with its associated seed bank from Sych to a receptor site located between the A4097 Kingsbury Road and Marston Lane.

Impacts and associated effects

6.24.6 Loss of approximately 0.1ha of ancient woodland from Sych Wood was reported in the main ES. The impacts were reported to result in a permanent adverse effect on the conservation status of ancient woodland which would be significant at the county/metropolitan level. Recent updates to the scheme GIS database has increased the accuracy of the figures previously reported and the expected loss of ancient woodland at Sych Wood is now expected to be approximately 0.2ha (See Figure EC-AWS-017).

Compensatory measures

6.24.7 Table 27 provides a summary of the compensatory measures that are proposed in response to the expected effects on Sych Wood.

Table 27: Ancient woodland strategy summary for Sych Wood

Woodland	Sych Wood
CFA	20
Status	Ancient semi-natural woodland and part of Hams hall Woodlands Local Wildlife Site

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.2**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.1**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**2.1**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.24.8 The main ES stated that soil with its associated seed bank will be salvaged and translocated to a receptor site that is between the A4097 Kingsbury Road and Marston Lane. This 0.1ha receptor site is shown on Figure EC-AWS-017.

Woodland planting

6.24.9 A 2.1ha area of new planting will be provided in response to the loss of ancient woodland at Sych Wood (excluding ancient woodland soil receptor area). This will be between the A4097 Kingsbury Road and Marston Lane, approximately 1.3km northwest of the donor site and will adjoin the 0.1ha ancient woodland soil receptor area.

6.25 North Wood (CFA 20)

Baseline conditions

6.25.1 North Wood (7.1ha) was listed on the ancient woodland inventory in 2012 as semi-natural ancient woodland to the south and replanted ancient woodland in the north. North Wood is also an LWS.

6.25.2 North Wood was not accessible prior to the main ES being published. However, an NVC survey of North Wood was carried out in 2015. . The woodland is privately managed. It is broadleaved with mature trees and developed shrub and ground flora layers. There is a medieval moat in the north, several ponds and remnants of a ridge and furrow system (an agricultural practice from the Middle Ages) in the southern portion of the wood. The woodland canopy is dominated by ash with occasional wild cherry and field maple with a dominance of pedunculate oak and hornbeam to the north of the wood. Coppiced hazel with hawthorn and English elm saplings are constant in the shrub layer with occasional elder and holly. The ground flora is diverse and the constant species include rough meadow grass and bramble with the ancient woodland indicators wood millet and native bluebell. Several ancient woodland indicators are locally frequent including three-nerved sandwort, wood sorrel, pignut, primrose, sweet violet (*Viola odorata*) and woodruff. There is a small stand of the rare native martagon lily but the provenance is not known and may have been introduced.

6.25.3 The woodland community most closely resembles sub-community W8b *Fraxinus excelsior-Acer campestre-Mercurialis perennis Anemone nemorosa* (with a MATCH coefficient of similarity of 55%). The W8 woodland community is typical of calcareous soils in the lowlands with a dominance of ash and field maple in the canopy. The W8b sub-community tends to be a damper community with hornbeam more prevalent and less cover of dog's mercury than other communities. Due to the survey being undertaken at a sub-optimal time of year it has not been confirmed if the sub-community constant species wood anemone (*Anemone nemorosa*) is present in the ground flora.

Valuation

6.25.4 North Wood has been assessed as having a conservation value significant at the county/metropolitan level.

Measures taken to avoid or reduce impacts

6.25.5 The design has aimed to minimise habitat loss within North Wood by reducing the areas of embankments through North Wood.

6.25.6 The amendment AP2-020-005 resulted in the reduction in the amount of ancient woodland lost in the main ES from 2.2ha to 1.9ha (18% reduction).

Impacts and associated effects

6.25.7 Loss of 2.2ha (30%) of ancient woodland habitat from North Wood was reported in the main ES from both areas of ancient semi-natural and replanted ancient woodland. There would be fragmentation and isolation of retained eastern and western sections of the woodland either side of the route. The impacts will result in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

6.25.8 The amendment AP2-002-005 resulted in the reduction in the amount of ancient woodland lost in the main ES from 2.2haha to 1.9ha. However, this did not change the significance level of the adverse effect reported in the main ES.

6.25.9 Recent updates to the scheme GIS database have increased the accuracy of the figures reported in the SES and AP2 ES and the expected loss of ancient woodland at North Wood is now expected to be approximately 1.8ha, of which 1.5ha is ancient semi-natural woodland. The construction of the scheme through the middle of North Wood will result in two isolated areas of retained ancient woodland. These areas will be more susceptible to degradation through edge effects (See Figure EC-AWS-016).

Compensatory measures

6.25.10 Table 28 provides a summary of the compensatory measures that are proposed in response to the expected effects on North Wood.

Table 28: Ancient woodland strategy summary for North Wood

Woodland	North Wood
CFA	20
Status	Ancient semi-natural woodland and PAWS. Local Wildlife Site

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	1.8 (including 0.3haPAWS)
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	1.8
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.7
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

6.25.11 The translocation receptor area for any suitable soils from North Wood will be approximately 1.8ha in size and located within the adjacent woodland habitat creation area between North Wood and Cuttle Mill Fishery(See Figure EC-AWS-016) .

Soil conditions

6.25.12 The soil conditions at both the ancient woodland donor area and the receptor site are predominately classified as 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils', however there are small areas of both sites which are classified as 'Loamy soils with naturally high groundwater'.

Woodland planting

6.25.13 A 0.7ha area of new planting will be provided in response to the loss of ancient woodland at North Wood (excluding ancient woodland soil receptor area) (See Figure EC-AWS-016). This will be to the west of North Wood and will adjoin the 1.8ha ancient woodland soil receptor area.

6.25.14 In addition there is extensive (approximately 20.1ha) landscape planting (woodland and scrub) provided as part of the scheme, on both sides of the route, between the Birmingham and Fazeley Canal and Bodymoor Heath Road. While these areas are specifically provided in response to losses of ancient woodland (and therefore are not included in the compensatory habitat creation proposals set out in this ancient woodland strategy) these areas provide links to the woodland habitat creation and the retained parts of North Wood.

6.26 Walkers Spinney (CFA 20)

Baseline conditions

6.26.1 Walker's Spinney (1.2ha) was not included on the ancient woodland inventory in 2012 and is not designated. Following a review of historic mapping in 2014, Walker's Spinney was recognised as ancient woodland. It was formally added to the ancient woodland inventory in October 2015.

6.26.2 An NVC survey of Walker's Spinney was carried out in 2013 (Main ES Volume 5 Appendix EC-001-003). Walker's Spinney is deciduous woodland located to the east of Middleton in Warwickshire. It supports lowland mixed deciduous woodland, a Habitat of Principal Importance. The woodland has a canopy of semi-mature trees with occasional mature trees. The shrub layer is sparse (30% cover). The ground flora is well-developed.

6.26.3 There is a dry ditch running north-south along the middle of the woodland, which branches at the southern end and outflows to Langley Brook. There is also a dry ditch running along the western edge of the woodland. Signs of inundation from Langley Brook were evident in the south of the wood, which influences the ground flora composition of this woodland.

6.26.4 The dominant canopy species is self-sown sycamore and alder, with standard mature pedunculate oak, occasional ash, beech, rowan and hazel. The shrub layer consists of dominant elder, hawthorn and bramble, with guelder rose (*Viburnum opulus*) also present at low abundance. The ground flora species include a number of ancient woodland indicator species including constant bluebell and locally abundant wild garlic (*Allium ursinum*), moschatel and occasional pignut (*Conopodium majus*) and wood millet. Dog's mercury, common nettle (*Urtica dioica*), cleavers (*Galiumaparine*) and broad-buckler fern (*Dryopteris dilatata*) are also frequent.

6.26.5 The woodland is formed of a mosaic of wet and dry woodland communities, with a diverse ground flora in the wetter areas. The wet woodland is W6 *Alnus glutinosa-Urtica dioica* woodland (MATCH coefficients of similarity of45%), which is present in the north and around the ditches. The drier woodland community W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland (MATCH coefficients of 46%) is present towards the south of the site, where bluebell and bramble are dominant.

Valuation

6.26.6 Walker's Spinney was not identified as ancient within the main ES. The woodland was considered to have local/parish value.

6.26.7 As a result of additional cultural heritage baseline information Walker's Spinney was identified as ancient woodland in the SES (Part 1 of the SES and AP2 ES) and its value increased to district/borough.

Measures taken to avoid or reduce impacts

6.26.8 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Walker's Spinney. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.26.9 The SES and AP2 ES reported a loss of 0.2ha of ancient woodland from Walkers Spinney (at the edge of Church Lane) which would result in an adverse effect on the conservation status of the ancient woodland at Walker's Spinney that is significant at a district/borough level.

6.26.10 Recent updates to the scheme GIS database have increased the accuracy of the figures reported in the SES and AP2 ES and the expected loss of ancient woodland at Walkers Spinney is now expected to be approximately 0.1ha (See Figure EC-AWS-018).

Compensatory measures

6.26.11 Table 29 provides a summary of the compensatory measures that are proposed in response to the expected effects on Walker's Spinney.

Table 29: Ancient woodland strategy summary for Walker's Spinney

Woodland	Walker's Spinney
CFA	20
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.1**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.1**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.0**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.26.12 This receptor area, which will accommodate up to 0.1 ha of translocated soil, is approximately 30m from the retained area of Walker's Spinney (See Figure EC-AWS-018). This receptor site is located north of the Church Lane realignment on the western side of the route, located between the embankment and Highfields Farm. It is adjacent to proposed landscape planting so also ensures there is still woodland connectivity in the locality.

Soil conditions

The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'.

Woodland planting

6.26.13 Given that a very small area of woodland edge at Walker's Spinney will be lost, no woodland planting additional to the area of soils translocation is proposed as part of the ancient woodland strategy. There is approximately 2ha area of landscape planting (woodland and scrub) provided as part of the scheme (but not counted as part of the habitat creation totals described in this strategy), running along the south western edge of the proposed railway line (See Figure EC-AWS-018).

6.27 Unnamed copse off Drayton Lane (CFA 21)

Baseline conditions

6.27.1 The unnamed copse off Drayton Lane (0.2ha) was not surveyed before publication of the main ES due to access restrictions.

6.27.2 The copse off Drayton Lane was surveyed in 2014, following publication of the main ES. Based on the survey results, and further cultural heritage baseline information, the copse was considered to be ancient woodland, although this copse was not on the ancient woodland inventory in either 2012 or 2015.

Valuation

6.27.3 The unnamed copse off Drayton Lane was originally assessed as being secondary woodland of local/parish value.

6.27.4 On the basis of 2014 survey data, and further cultural heritage baseline information, the copse is considered to be ancient woodland and therefore it is now considered as being of district/borough value.

Measures taken to avoid or reduce impacts

6.27.5 There were no specific measures taken to avoid or reduce the loss of ancient woodland at unnamed copse off Drayton Lane. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.27.6 In the main ES, the loss of the copse off Drayton Lane was reported as part of the total loss of 8.1 ha of woodland. It was reported that this combined loss of woodland would result in a

permanent adverse effect on the conservation status of the habitat, which would be significant at up to a district/borough level.

6.27.7 All of the woodland within the copse off Drayton Lane is within the land required for construction of the scheme and will be lost (0.2ha) (See Figure EC-AWS-019). Following incorporation of the additional data regarding the status of the woodland, the SES reported an updated assessment which confirmed that the scheme will result in a permanent adverse effect on the conservation status of the copse off Drayton Lane that is significant at a district/borough level.

Compensatory measures

6.27.8 Table 30 provides a summary of the compensatory measures that are proposed in response to the expected effects on the unnamed copse off Drayton Lane.

Table 30: Ancient woodland strategy summary for unnamed copse off Drayton Lane

Woodland	Unnamed copse off Drayton Lane
CFA	21
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	0.2
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	0.2
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	0.2
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

Translocation of ancient woodland soils

6.27.9 This receptor area, which will accommodate up to 0.2 ha of translocated soil, is immediately adjacent to the southern section of the unnamed copse at Drayton Lane to be lost (See Figure EC-AWS-019).

Woodland planting

6.27.10 There is a 0.2ha area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) along Shirrall Drive and Drayton Lane (See Figure EC-AWS-019)

6.28 Roundhill Wood (CFA 21)

Baseline conditions

6.28.1 Roundhill Wood (4.2ha) is ancient semi-natural woodland and lies on an escarpment south of the village of Hints. It is designated as an SBI, and supports lowland mixed deciduous woodland, a Habitat of Principal Importance. The woodland has been replanted with sycamore and structural variation is poor, with the majority of the trees even-aged. There is evidence of game management for shooting, particularly for pheasants.

6.28.2 An NVC survey was carried out in 2012 (Main ES Volume 5 Appendix EC-001-003).This woodland is dominated by a high forest canopy of even-aged sycamore approximately 20-25m tall. Remnants of the original native canopy are a minor constituent of the wood, and include pedunculate oak, ash, and birch, some of the latter is present as standing dead wood. Rhododendron is dominant in the understorey and elsewhere Himalayan balsam is spreading along the path areas, particularly on the south-facing aspects.

6.28.3 Within clearings the ground flora consists of bracken, bluebell, grasses and abundant sycamore and Norway maple regeneration seedlings, but few saplings are present. There is a small patch of dog's mercury on the hilltop, but there was relatively little variety in the field layer.

6.28.4 Most of the woodland is W10d *Quercus robur–Pteridium aquilinum–Rubus fruticosus* woodland, *Holcus lanatus* sub-community (with a MATCH coefficient of similarity of 44%), although due to modification of the ground flora and canopy it is a species-poor example. This community is common throughout lowland Britain in plantations and disturbed woodlands on base-poor soils.

Valuation

6.28.5 Roundhill Wood has been as having a conservation value significant at the county/metropolitan level.

Measures taken to avoid or reduce impacts

6.28.6 The SES (part 1 of the SES) and AP2 details that since submission of the Bill, the elevation of the route is to be reduced as it passes west of Hints village. At Roundhill Wood, the vertical alignment is unchanged in order to protect the ancient woodland from further encroachment.

Impacts and associated effects

6.28.7 Loss of 1.3ha (30%) of ancient woodland from Roundhill Wood was reported in the main ES. The impacts result in a permanent adverse effect on the conservation status of ancient woodland which would be significant at a county/metropolitan level (See Figure EC-AWS-020).

Compensatory measures

6.28.8 Table 31 provides a summary of the compensatory measures that are proposed in response to the expected effects on Roundhill Wood.

Table 31: Ancient woodland strategy summary for Roundhill Wood

Woodland	Roundhill Wood
CFA	21
Status	Ancient semi-natural woodland and Site of Biological Importance

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	1.3
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	0.0
Area of receptor site for ancient woodland soils (ha)	1.1
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	10.9 (combined planting for Roundhill Wood and the Rookery)
Area of enhancement of existing ancient woodland (ha)	0.0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	0.0

*Incorporates area of new planting for Rookery

Translocation of ancient woodland soils

6.28.9 A 1.1ha receptor site has been identified adjacent to retained areas of Roundhill Wood (See Figure EC-AWS-020), however, translocation of soils to this area may be unfeasible due to the large amount of rhododendron present in the donor site. The decision whether to translocate the soils or not from the donor site will be taken at the detailed design stage. If some translocation does take place management of rhododendron will be required.

Woodland planting

6.28.10 Compensation in the form of approximately 10.9ha of woodland habitat creation (made up of three habitat creation areas of approximately 9.1ha, 1.0ha and 0.8ha) will also be provided adjacent to, and to the north of retained sections of the Rookery to mitigate for losses at Roundhill Wood and the Rookery (See Figure EC-AWS-020). This woodland habitat creation will provide better habitat links between Rookery, Job's Hill Plantation and Milditch Wood/Rough Leasow. There is also landscape planting along the eastern part of the route from Roundhill Wood to the north towards the Black-Bourne Brook and south of Roundhill Wood. This landscape planting will link Roundhill Wood to the wider landscape.

6.29 Rookery (CFA 21)

Baseline conditions

6.29.1 Rookery (7.4ha) is ancient semi-natural woodland and is also designated as an SBI.

6.29.2 No survey has been carried out in this woodland due to access restrictions. However, the Rookery SBI citation mentions that the woodland supports birch/oak woodland with a shrub layer dominated by rhododendron. Part of the woodland comprises lowland mixed deciduous woodland, a Habitat of Principal Importance. The SBI citation states that the ground flora is sparse with native bluebell abundant on the western half of the site. The site slopes west to east with eastern slopes supporting huge swathes of bracken. The SBI citation states that the landowners use this woodland for pheasant rearing, as observed by sightings of feeders within clearings. The shrub layer is of limited ecological value due to the abundance of rhododendron. Himalayan balsam is also present in large amounts. The canopy is sycamore dominated with large expanses of conifers at the core of the site.

Valuation

6.29.3 Ancient woodland within the Rookery SBI has been assessed as being of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.29.4 Since submission of the Bill, it is proposed to reduce the elevation of the route as it passes west of Hints village (SES and AP2 ES Volume 2 CFA 21 Amendment AP2-021-001). The SES and AP2 ES state the Hints cutting will deepen when compared to the original scheme. Deepening adjacent to Rookery Wood is achieved through the introduction of a retaining wall reducing the loss of ancient woodland by 1.1ha when compared to the original scheme.

Impacts and associated effects

6.29.5 The main ES reported the loss of 2.0ha of ancient woodland from the Rookery, resulting in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level. Following incorporation of amendments the scheme will result in the loss of approximately 1.4ha of ancient woodland from the Rookery(See Figure EC-AWS-020) . This remains an adverse effect significant at the county/metropolitan level.

Compensatory measures

6.29.6 Table 32 provides a summary of the compensatory measures that are proposed in response to the expected effects on Rookery.

Table 32: Ancient woodland strategy summary for Rookery

Woodland	Rookery
CFA	21
Status	Ancient semi-natural woodland and Site of Biological Importance

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.4**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.1**
Area of receptor site for ancient woodland soils (ha)	**1.7**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**10.9** (combined planting for Roundhill Wood and the Rookery)
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

*Incorporates area of new planting for Roundhill Wood.

Translocation of ancient woodland soils

6.29.7 Three areas within the ecological mitigation area directly adjacent to the retained part of the Rookery that provide a total of 1.7ha have been identified as translocation receptor areas for any suitable soils lost from the Rookery (See Figure EC-AWS-020). However, translocation may be unfeasible due to the large amount of rhododendron and Himalayan balsam present within the donor site. The decision whether to translocate the soils or not will be taken at the detailed design stage. If some translocation does take place management of non-native invasive species will be required as well as prevention of the establishment of conifers. Any areas currently identified for translocation of soils that do not receive soils will be prepared and planted in accordance with the guidance provided in the Ecology Technical Standard (see Appendix 4).

Soil conditions

6.29.8 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'freely draining slightly acid loamy soils'.

Woodland planting

6.29.9 Compensation in the form of 10.90ha of woodland habitat creation (made up of three habitat creation areas of approximately 9.1ha, 1.0ha and 0.8ha) will also be provided adjacent to and to the north of retained sections of the Rookery to mitigate for losses at Roundhill Wood and the Rookery (See Figure EC-AWS-020). This woodland habitat creation will provide better habitat links between Rookery, Job's Hill Plantation and Milditch Wood/Rough Leasow.

6.30 Fulfen Wood (CFA 22)

Baseline conditions

6.30.1 Fulfen Wood was not identified on the ancient woodland inventory in 2012 and is not designated as such. Following a review of historic mapping in early 2015, Fulfen Wood was recognised as ancient woodland, and was formally added to the ancient woodland inventory in October 2015.

6.30.2 Fulfen Wood consists of two strips of woodland separated by an arable field, one of 0.6ha and one of 0.4ha. No survey has been undertaken at this woodland due to lack of access.

Valuation

6.30.3 Fulfen Wood was considered to be of local/parish value in the main ES. Based on additional cultural heritage information it was reassessed in the SES (Part 1 of the SES and AP2 ES) it is now considered to be of county/metropolitan value

Measures taken to avoid or reduce impacts

6.30.4 The AP2 ES (Part 2 of the SES and AP2 ES) stated that the section of Fulfen Wood located to the east of the HS2 route (0.6ha) will be retained as a result of the reduced scheme footprint associated with the Lichfield Area design change (SES and AP2 ES Volume 2 CFA 22: AP2-022-001), reducing the loss of ancient woodland from Fulfen Wood to 0.4ha (a reduction of 60%).

Impacts and associated effects

6.30.5 Following incorporation of amendment AP2-022-001 the scheme will result in the loss of 0.4ha of ancient woodland from Fulfen Wood. This is a permanent adverse effect on the conservation status of the woodland which will be significant at up to a county/metropolitan level (See Figure EC-AWS-021).

6.30.6 The section of Fulfen Wood located to the east of the HS2 route (0.6ha), remains within the land covered by Hybrid Bill. However, this area will be retained and no works are required within this area.

Compensatory measures

6.30.7 Table 33 provides a summary of the compensatory measures that are proposed in response to the expected effects on Fulfen Wood.

Table 33: Ancient woodland strategy summary for Fulfen Wood

Woodland	Fulfen Wood
CFA	22
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**

Area of direct loss of ancient woodland (ha)	**0.4**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.6**
Area of receptor site for ancient woodland soils (ha)	**0.4**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.9**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.30.8 An area of up to 0.4ha has now been identified directly adjacent to the retained part of Fulfen Wood to receive any suitable ancient woodland soil from the section of Fulfen Wood that will be lost (See Figure EC-AWS-021).

Soil conditions

6.30.9 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'.

Woodland planting

6.30.10 A minimum 0.9ha of woodland habitat creation (adjacent parcels of approximately 0.8ha and 0.1ha) will be provided in close proximity to the retained woodland and proposed soils receptor.

6.31 Little Lyntus Wood (CFA 22)

Baseline conditions

6.31.1 Little Lyntus (1.4ha) was not included on the ancient woodland inventory in 2012 and is not designated. Following a review of historic mapping in 2015, the woodland was formally added to the inventory in October 2015 as ancient semi-natural woodland.

6.31.2 Little Lyntus near Wood End Lane was not surveyed before publication of the main ES due to access restrictions. The woodland was surveyed in 2014 and was found to support a diverse ground flora including a number of ancient woodland indicator species, such as small-leaved lime (*Tilia cordata*), moschatel, wood anemone, pignut, bluebell and dog's mercury. Two small-leaved lime coppice stools were found within Little Lyntus. This tree species is uncommon in Staffordshire. The woodland also has ancient or veteran trees and evidence of past coppicing, as well as a ditch bank at the woodland edge.

Valuation

6.31.3 Based on available information, the main ES reported Little Lyntus to be of local/parish value.

6.31.4 As a result of botanical surveys and further cultural heritage baseline information Little Lyntus was considered likely to be ancient woodland and it was reassessed as being of county/metropolitan value in the SES (Part 1 of the SES and AP2 ES).

Measures taken to avoid or reduce impacts

6.31.5 The alignment of the route in CFA22 changed as a result of the Lichfield Area design changes (AP2-022-001). While the current assessment assumes the loss of all ancient woodland at Little Lyntus the revised design gives the opportunity with sensitive working to retain areas of ancient woodland either side of the alignment. These opportunities will be explored further during detailed design in order to maximise the extent of ancient woodland that can be retained.

Impacts and associated effects

6.31.6 The loss of Little Lyntus due to the original scheme did not result in a significant effect as it was not previously understood to have been ancient woodland.

6.31.7 As botanical surveys and cultural heritage information reassessed Little Lyntus Wood as ancient woodland the loss of the woodland (1.4ha) as a result of the SES scheme resulted in a permanent adverse effect on the conservation status of the woodland which will be significant at a county/metropolitan level.

6.31.8 The alignment of the route in CFA22 changed as a result of the Lichfield Area design changes (AP2-022-001) introduced and assessed in Part 2 of the SES and AP2 ES. The AP2 ES reported the worst-case scenario of total loss of Little Lyntus (1.4ha) as it is within the land required for construction of the AP2 revised scheme (See Figure EC-AWS-022) . This loss will result in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

6.31.9 The AP2 revised scheme stated that as much as practicable of Little Lyntus ancient woodland will be retained during construction. However, for the purposes of the ancient woodland strategy a worst-case scenario of the total loss of this area is currently assumed.

6.31.10 The total loss of ancient woodland at Little Lyntus would result in a permanent adverse effect on the conservation status of ancient woodland which would be significant at a county/metropolitan level.

Compensatory measures

6.31.11 Table 34 provides a summary of the compensatory measures that are proposed in response to the expected effects on Little Lyntus Wood.

Table 34: Ancient woodland strategy summary for Little Lyntus Wood

Woodland	Little Lyntus Wood
CFA	22
Status	Ancient semi-natural woodland

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.4**

Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**2.2 (joint receptor area for Big Lyntus and Little Lyntus)**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**1.4**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

*Incorporating soil receptor site for Big Lyntus Wood

Translocation of ancient woodland soils

6.31.12 Soils from areas of ancient woodland which cannot be retained will be translocated, with its associated seed bank, to part of a 2.2ha woodland habitat creation area adjacent to the retained areas of Big Lyntus Wood (See Figure EC-AWS-022) . This area will also take any translocated soils from Big Lyntus Wood.

Soil conditions

6.31.13 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'naturally wet very acid sandy and loamy soils'.

Woodland planting

6.31.14 A minimum of 1.4ha of woodland habitat creation will be provided in the areas adjacent to the retained parts of Little Lyntus Wood to mitigate for losses at Little Lyntus Wood (See Figure EC-AWS-022). The 1.4ha is expected to consist of an area of approximately 0.8ha in size to the south of the alignment, and areas of 0.3ha and 0.4ha to the north of the alignment.

6.32 Big Lyntus Wood (CFA 22)

Baseline conditions

6.32.1 Big Lyntus Wood (6.6ha) is ancient semi-natural woodland. It is a Staffordshire SBI and comprises mixed plantation trees with a small area of broadleaved woodland. The northern part of the woodland is replanted ancient woodland with a high canopy (up to 30m) dominated by semi-mature beech and Scots pine trees. Ground flora is limited to the edges of the woodland or patches where there are gaps in the canopy, where bluebell, wood sage (*Teucrium scorodonia*), greater stitchwort (*Stellaria holostea*) and yellow archangel (*Lamium galeobdolon*) are present, with common nettle and cleavers being frequent species.

6.32.2 NVC survey in 2012 (SES and AP2 ES Volume 5 Appendix EC-001-003) identified the beech woodland community W15 *Fagus sylvatica-Deschampsia flexuosa* woodland, which is lowland mixed deciduous woodland, a Habitat of Principal Importance. Between the northern part of the woodland and a strip of semi-natural woodland on the southern boundary of the site is a more recent plantation dominated by pedunculate oak with occasional ash. The strip of ancient semi-natural woodland in the south of the site is structurally and botanically more diverse than the plantation areas.

Valuation

6.32.3 Big Lyntus Wood has been assessed as being of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.32.4 There were no specific measures taken to avoid or reduce the loss of ancient woodland at Crackley Wood North, including Big Lyntus Wood. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

6.32.5 The total area of the woodland to be lost from Big Lyntus Wood is documented as ancient replanted woodland on the Ancient Woodland Inventory (Natural England, 2015). The area of Big Lyntus Wood that is documented as ancient semi-natural woodland is not to be impacted by the scheme.

Impacts and associated effects

6.32.6 No effects were reported on Big Lyntus Wood in the main ES.

6.32.7 The alignment of the route in CFA22 changed as a result of the Lichfield Area design changes (SES and AP2 ES Volume 2: AP2-022-001) introduced and assessed in Part 2 of the SES and AP2 ES. As a result, the scheme is now expected to result in the loss of 0.8ha of Big Lyntus Wood (See Figure EC-AWS-022). This will result in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

Compensatory measures

6.32.8 Table 35 provides a summary of the compensatory measures that are proposed in response to the expected effects on Big Lyntus Wood.

Table 35: Ancient woodland strategy summary for Big Lyntus Wood

Woodland	Big Lyntus Wood
CFA	22
Status	Plantation on ancient woodland (PAWS) and Site of Biological Importance

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.8 (all PAWS)**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**2.2 (joint receptor area for Big Lyntus and Little Lyntus)**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.4**
Area of enhancement of existing ancient woodland (ha)	**0.0**

*Incorporating receptor site for Little Lyntus

Translocation of ancient woodland soils

6.32.9 The translocation receptor area for any suitable soils from Big Lyntus Wood will be within the adjacent 2.2ha woodland habitat creation area to the east (See Figure EC-AWS-022). This receptor site will also incorporate any suitable soils from Little Lyntus Wood.

Soil conditions

6.32.10 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'naturally wet very acid sandy and loamy soils'.

Woodland planting

6.32.11 A 0.4ha area of woodland habitat creation will be provided adjacent to the soil receptor site (See Figure EC-AWS-022).

6.33 Ravenshaw Wood (CFA 22)

Baseline conditions

6.33.1 Ravenshaw Wood, Black Slough and Slaish is a Staffordshire SBI and is recognised as lowland mixed deciduous woodland, a Habitat of Principal Importance. Parts of Ravenshaw Wood and the north-western compartment known as the Slaish are included on the ancient woodland inventory, some as ancient semi-natural and some as plantation on ancient woodland. The remainder of the site is secondary woodland and former heathland or scrub.

6.33.2 The woodland has a rather open, even aged canopy of pedunculate oak, with abundant downy birch in the gaps between the oaks. Other canopy trees are rare, apart from isolated groups of alder or Scots pine trees. The shrub layer is very open but for a few large amalgamations of mature rhododendron bushes, which have attained a height of up to 5m in places. Where rhododendron is present, it has excluded almost the entire ground flora beneath, but for a few moss species. Other shrub species include rowan, and young downy birch or pedunculate oak. A few grey willow shrubs are present in waterlogged areas. The ground flora is dominated in large areas by a blanket covering of bracken, which at the time of the survey was over 1m in height. In the north, east and south of the site, shading or waterlogging reduces the dominance of bracken and there are patches where broad buckler-fern is abundant or bramble dominant. Bramble is present throughout the woodland at variable abundance, and other species occasionally recorded include creeping soft grass, common nettle, climbing corydalis and honeysuckle. Common feather-moss (*Kindbergia praelonga*), rough-stalked feather-moss (*Brachythecium rutabulum*), and swan's-neck thyme-moss (*Mnium hornum*) are common in the damper areas of woodland.

6.33.3 This woodland community is W10d *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Holcus lanatus* sub-community (MATCH coefficients of 57%) characteristic of open, often young, woods on base-poor soils and widespread over the lowlands of England and Wales.

6.33.4 In the north-west of Ravenshaw Wood the woodland is on waterlogged ground. Here the canopy is similar to the rest of the wood, but there is a small area (less than 0.1 ha) where

tussocks of purple moor-grass are prominent in the ground flora. Wavy hair-grass (*Deschampsia flexuosa*) is also present, particularly on a boundary bank that marks the eastern edge of the wood. This woodland community is W4a *Betula pubescens-Molinia caerulea* woodland, *Dryopteris dilatata-Rubus fruticosus* sub-community (MATCH coefficient of 45%) a widespread but locally occurring community of damp, acidic soils in the British lowlands.

Valuation

6.33.5 The areas of ancient woodland at Ravenshaw Wood are of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.33.6 As a result of the Lichfield Area design changes (SES and AP2 ES Volume 2 CFA 22: AP2-022-001) the extent of ancient woodland lost within Ravenshaw Wood was reduced to 1.7ha,and losses of ancient semi-natural woodland at the Slaish have been avoided.

6.33.7 Of the 1.7ha area to be lost from Ravenshaw Wood, 0.7ha is identified as ancient replanted woodland and the remaining 1.0ha is identified as ancient semi-natural woodland.

Impacts and associated effects

6.33.8 Following incorporation of the Lichfield Area design changes the scheme will result in the loss of a 1.7ha area of Ravenshaw Wood for construction of the scheme. This has been assessed as a permanent adverse effect on the conservation status of this woodland that is significant at county/metropolitan level (See Figure EC-AWS-023). The alignment of the route in CFA22 will result in severing Ravenshaw Wood into two sections. This will increase the vulnerability for degradation of each remaining woodland section due to edge effects.

Compensatory measures

6.33.9 Table 36 provides a summary of the compensatory measures that are proposed in response to the expected effects on Ravenshaw Wood.

Table 36: Ancient woodland strategy summary for Ravenshaw Wood

Woodland	Ravenshaw Wood
CFA	22
Status	Ancient semi-natural woodland and PAWS. Site of Biological Importance

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**1.7 (including 0.7ha PAWS)**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**1.7**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**2.7**

Area of enhancement of existing ancient woodland (ha)	**8.7 (total area including The Slaish)**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**13.0**

Translocation of ancient woodland soils

6.33.10 The translocation receptor area for any suitable soils from Ravenshaw (up to 1.7ha) will be an area of the same extent (1.7ha) between the retained section of Ravenshaw Wood and the Trent and Mersey Canal (See Figure EC-AWS-023).

Soil conditions

6.33.11 The soil conditions at both the ancient woodland donor area and the receptor site are classified as 'naturally wet very acid sandy and loamy soils'

Woodland planting

6.33.12 A minimum of 2.7ha of woodland compensation planting will also be created, consisting of an area of approximately 2.0ha adjoining the proposed soil receptor, and an additional area of approximately 0.7ha adjoining the small section of Ravenshaw Wood that will be retained to the south of the railway.

6.33.13 Additional landscape planting north of the alignment, west of the retained section of Ravenshaw Wood, was originally included in the design of the scheme as landscape mitigation planning. Subsequently, this provision has been changed post SES3 and AP4, through agreement with the landowner, for the area to remain as agricultural land.

Enhancement of ancient woodland

6.33.14 A total area of approximately 8.7ha of ancient woodland will be retained and enhanced as part of the compensation for ancient woodland loss at Ravenshaw Wood. Details of management to be provided in these areas will be developed during detailed design but is likely to include the removal of any invasive species, glade creation and installation of bird and bat boxes (See Figure EC-AWS-023).

6.33.15 Of the area of ancient woodland subject to enhancement, 4.5ha comprises ancient replanted woodland and 4.2ha comprises ancient semi-natural woodland.

Enhancement of non-ancient woodland

6.33.16 A total area of 13.0ha of non-ancient woodland (including parts of the Slaish and Black Slough) will be retained and enhanced as part of the compensation for ancient woodland loss at Ravenshaw Wood. Details of management to be provided in these areas will be developed during detailed design but is likely to include the removal of any invasive species, glade creation and installation of bird and bat boxes (See Figure EC-AWS-023).

6.34 Slaish Wood (CFA 22)

Baseline conditions

6.34.1 Black Slough and the Slaish are adjacent woodland blocks to the west of, and contiguous with, Ravenshaw Wood alongside the southern bank of the Trent and Mersey Canal. They are recognised as lowland mixed deciduous woodland, Habitat of Principal Importance, and part

of the woodland in the northern compartment, known as the Slaish, is identified in the ancient woodland inventory as ancient semi-natural woodland.

6.34.2 An NVC survey carried out in 2012 (SES and AP2 ES Volume 5 EC-001-003) reported very wet ground conditions with a canopy of grey willow with scattered crack willow. Alder is present alongside the canal. Rhododendron is also present. There are small pools and raised areas forming a mosaic of wet and drier conditions. Stands of tall herbaceous plants such as yellow iris, lesser pond-sedge and soft rush are present, with patches of creeping soft-grass and red fescue in drier areas. Broad buckler-fern and male fern are scattered throughout. The most noticeable characteristic of this habitat are cushions of bog mosses, including blunt-leaved bogmoss (*Sphagnum palustre*) and spiky bog-moss (*Sphagnum squarrosum*). Bittersweet (*Solanum dulcamara*) and marsh willowherb (*Epilobium palustre*) are also present.

6.34.3 The woodland is likely to be W2b *Salix cinerea-Betula pubescens-Phragmites australis* woodland, *Sphagnum* spp. sub-community, despite unreliable MATCH results due to the small sample set. This is an uncommon community in the Midlands, more often occurring in East Anglia, with local stands in Cheshire and Shropshire. These habitat types do not occur in the contiguous Ravenshaw Wood or Black Slough.

Valuation

6.34.4 The Slaish was identified in the main ES as being of county/metropolitan value

Measures taken to avoid or reduce impacts

6.34.5 The AP2 revised scheme involved realignment of the route to avoid loss of ancient woodland within the Slaish.

Impacts and associated effects

6.34.6 The main ES reported habitat loss from Ravenshaw Wood, Black Slough and Slaish, leading to an adverse effect on the conservation status of woodland that will be significant at a county/metropolitan level Following incorporation of the Lichfield Area design changes no losses of ancient woodland at the Slaish will occur.

Compensatory measures

6.34.7 Table 37 provides a summary of the compensatory measures that are proposed in response to the expected effects on The Slaish.

Table 37: Ancient woodland strategy summary for Ravenshaw Wood

Woodland	The Slaish
CFA	22
Status	Ancient semi-natural woodland and Site of Biological Importance

Description	**Extent of habitat in category (ha)**

Area of direct loss of ancient woodland (ha)	**0.0**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.0**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.0**
Area of enhancement of existing ancient woodland (ha)	**8.7 (enhancement as part of Ravenshaw Wood compensation)**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**13.0 (including**

Soil conditions

6.34.8 The soil conditions at The Slaish are classified as 'naturally wet very acid sandy and loamy soils'.

Enhancement of ancient woodland

6.34.9 Enhancement of ancient woodland at the Slaish is part of the compensation measures for impacts to Ravenshaw Wood. A total area of approximately 8.7ha of ancient woodland will be retained and enhanced as part of the compensation for ancient woodland loss at Ravenshaw Wood. Details of management to be provided in these areas will be developed during detailed design but is likely to include the removal of any invasive species, glade creation and installation of bird and bat boxes (See Figure EC-AWS-023).

6.34.10 Of the area of ancient woodland to be subject to enhancement, 4.5ha comprises ancient replanted woodland and 4.2ha comprises ancient semi-natural woodland.

Enhancement of non-ancient woodland

6.34.11 Enhancement of non-ancient woodland at the Slaish is part of the compensation measures for impacts to Ravenshaw Wood. A total area of 13.1ha of non-ancient woodland (including parts of the Slaish and Black Slough) will be retained and enhanced as part of the compensation for ancient woodland loss at Ravenshaw Wood. Details of management to be provided in these areas will be developed during detailed design but is likely to include the removal of any invasive species, glade creation and installation of bird and bat boxes (See Figure EC-AWS-023).

6.35 Vicar's Coppice (CFA 22)

Baseline conditions

6.35.1 Vicar's Coppice Biodiversity Alert Site (BAS) lies adjacent to the A515 (Lichfield Road) and consists of 7ha of ancient semi-natural broadleaved woodland identified on the ancient woodland inventory in 2012.

6.35.2 Vicar's Coppice is a large area of semi-natural broadleaved woodland covering 7.7ha centred on grid reference SK110137. Vicar's Coppice was surveyed in 2015. The dominant canopy species are pedunculate oak and silver birch with occasional sycamore. The pedunculate oak

trees include occasional veteran specimens. The understorey has been cleared in a large central patch of the woodland for paintballing and understorey layers are restricted to the edges of the woodland. The shrub layer is patchy and dominated by holly and the invasive rhododendron. Occasional shrub species include elder and rowan. Ground flora cover is high with bramble and bracken as constant species with occasional wood sage and honeysuckle. This woodland most closely resembles the W10d *Quercus robur-Pteridium aquilinum-Rubus fruticosus Holcus lanatus* sub-community (with a MATCH coefficient of 50%). This is a woodland characteristic of base-poor soils in the lowlands and this particular sub-community has a more impoverished ground flora with a lack of ancient woodland indicators with bracken becoming locally dominant in open areas.

6.35.3 At the northern corner and along the north-western edge of the wood, where it borders a ditch, the canopy changes and it is dominated by ash with occasional field maple and sycamore. The shrub layer is coppiced hazel, crab apple (*Malus* sylvestris) with occasional holly and rhododendron. The ground flora is dominated by dog's mercury. The calcareous community in the north-west corner most closely resembles W8d community *Fraxinus excelsior- Acer campestre-Mercurialis perennis Hedera helix* sub-community (with a MATCH coefficient of 42.5%). A nearby ditch system is probably causing local base enrichment leading to this change in woodland community.

Valuation

6.35.4 Vicar's Coppice has been assessed to be of county/metropolitan value

Measures taken to avoid or reduce impacts

6.35.5 Compensation within the main ES included translocation of ancient woodland soil with its associated seed bank from Vicar's Coppice to two receptor sites adjacent to the existing Vicar's Coppice.

Impacts and associated effects

6.35.6 The main ES reported that a narrow strip on the western edge of Vicar's Coppice ancient woodland (0.5ha) will be permanently lost due to the realignment of Wood End Lane and works on the A515 (Lichfield Road). The loss will result in a permanent adverse effect on the conservation status of ancient woodland which will be significant at a county/metropolitan level.

6.35.7 Recent updates to the scheme GIS database have confirmed the loss of ancient woodland at Vicar's Copse is now expected to be approximately 0.6ha (See Figure EC-AWS-024). This remains an adverse effect on the conservation status of the ancient woodland.

6.35.8 The area of Vicar's Coppice <0.1ha that is being retained will be more vulnerable to degradation through edge effects (See Figure EC-AWS-024).

Compensatory measures

6.35.9 Table 38 provides a summary of the compensatory measures that are proposed in response to the expected effects on Vicar's Coppice.

Table 38: Ancient woodland strategy summary for Vicar's Coppice

Woodland	Vicar's Coppice

CFA	22
Status	Ancient semi-natural woodland and Biological Alert Site.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**0.6**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**0.0**
Area of receptor site for ancient woodland soils (ha)	**0.5**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**4.1**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.35.10 Ancient woodland soil with its associated seed bank will be carefully removed and translocated to a 0.5ha area adjacent to the retained area of Vicar's Coppice (See Figure EC-AWS-024).

Soil conditions

6.35.11 The soil conditions at the ancient woodland donor area are classified as 'freely draining slightly acid sandy soils' while the soil conditions at the receptor area are classified as 'naturally wet very acid sandy and loamy soils'.

Woodland planting

6.35.12 A 3.3ha area of woodland habitat creation will be provided adjacent to the retained part of Vicar's Coppice and the route and a 0.9ha area has been included to the west of Vicar's Coppice (See Figure EC-AWS-024).

6.36 John's Gorse (including Hanch Wood) (CFA 22)

Baseline conditions

6.36.1 John's Gorse is included as ancient woodland inventory in the ancient woodland industry (although the woodland is not given a name on the inventory) and includes three woodland blocks near Shaw Lane east of Longdon in Staffordshire. These woodlands are lowland mixed deciduous woodland, a Habitat of Principal Importance and all are ancient semi-natural woodland.

6.36.2 Two of the woodland blocks form John's Gorse SBI, the most northerly block being 0.6ha and the more southerly 1.8ha. The third small block of woodland (1.0ha) is alongside the current Lichfield to Stafford rail line and is known as Hanch Wood.

6.36.3 The most northerly woodland block of John's Gorse is unfenced to cattle and is heavily grazed. The larger more southerly woodland block of John's Gorse (also known as Fox Covert)

has been fenced off and is less affected by cattle. An NVC survey was carried out within this woodland in 2012 (Main ES Volume 5 Appendix EC-001-003). This woodland supports mature conifers and has evidence of past disturbance. The woodland appears to have once been much larger and since reduced by felling and wayleave maintenance to accommodate an overhead power line. This woodland has been extensively planted with conifers, including Norway spruce (*Picea abies*), Scots pine and common larch. The canopy is open with relatively few mature broadleaved trees. Cherry and birch are present, but more than half the area consists of hawthorn and elder scrub, with some hazel. A more open area in the south-eastern corner of the wood had abundant bracken and gorse bushes visible at the edge.

6.36.4 Access to the northern block of John's Gorse was not obtained for detailed survey although observations were made from the field boundary. The canopy consists mainly of oak and some birch, now dying back, above a grassy field layer. The very sparse understorey contains common hawthorn, holly and sweet chestnut. Much fallen wood was visible on the ground.

Valuation

6.36.5 John's Gorse has been assessed as being of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.36.6 There were no specific measures taken to avoid or reduce the loss of ancient woodland at John's Gorse. The route of the railway is constrained in this location by alignment constraints and the physical geography of the land.

Impacts and associated effects

6.36.7 John's Gorse ancient woodland is almost entirely within the land required for construction of the original scheme and a total of approximately 2.7ha of it would be lost (See Figure EC-AWS-025). This will result in a permanent adverse effect on ancient woodland that will be significant, at a county/metropolitan level.

Compensatory measures

6.36.8 Table 39 provides a summary of the compensatory measures that are proposed in response to the expected effects on John's Gorse.

Table 39: Ancient woodland strategy summary for John's Gorse

Woodland	John's Gorse
CFA	22
Status	Ancient semi-natural woodland and Site of Biological Importance.

Description	**Extent of habitat in category (ha)**
Area of direct loss of ancient woodland (ha)	**2.7**
Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)	**<0.1**

Area of receptor site for ancient woodland soils (ha)	**1.7**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	**0.5**
Area of enhancement of existing ancient woodland (ha)	**0.0**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0.0**

Translocation of ancient woodland soils

6.36.9 Ancient woodland soil with its associated seed bank will be carefully removed and translocated to a site adjacent to the existing woodland. This receptor site currently identified is up to 1.7ha in area (See Figure EC-AWS-025). If there is a requirement for a larger area to receive soils then it is likely the nearby proposed area of new planting that is 0.5ha in size will also be utilised to receive soils.

Woodland planting

6.36.10 A total area of 0.5ha of new planting will be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area), planted between the existing Hanch Wood and the existing western section of John's Gorse (See Figure EC-AWS-025). If there is a requirement for a larger area to receive soils then it is likely this area will also be utilised to receive soils.

6.37 Park Hall Wood (CFA 25)

Baseline conditions

6.37.1 Park Hall Wood (ancient semi-natural woodland) is partly within land that will be required for the construction of the Scheme.

6.37.2 The area of Park Hall Wood that will be impacted by the Scheme is characteristic of National Vegetation Classification (NVC) plant community, W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, and is located on a steep 20° slope. There is no sign of recent woodland management, although some of the trees were previously coppiced. At this location the woodland tree canopy includes: ash, wild cherry, pedunculate oak and wych elm (*Ulmus glabra*), a sparse understorey of young ash and a field layer of ramsons, bluebell, Indian balsam (*Impatiens glandulifera*), dog's mercury, common nettle and wood millet.

6.37.3 Ancient woodland plant indicator species recorded from Park Hall Wood are: field maple, holly, crab apple, wild cherry, small-leaved lime, wych elm, ramsons, pignut, bluebell, yellow archangel, wood forget-me-not (*Myosotis sylvatica*), field rose, wood millet, wood meadow-grass, scaly buckler-fern (*Dryopetris affinis*) and hart's-tongue (*Asplenium scolopendrium*).

Valuation

6.37.4 Park Hall Wood has been assessed as being of county/metropolitan value.

Measures taken to avoid or reduce impacts

6.37.5 The overhead high voltage line diversion is designed to avoid loss of ancient woodland at Park Hall Wood, Parkhill Wood and Langley Hill Wood.

6.37.6 The extent of earthworks that are associated with construction of Water Orton Cutting are designed to reduce the permanent loss of ancient woodland at Park Hall Wood.

Impacts and associated effects

6.37.7 The area of Park Hall Wood that will be impacted by land required for the construction of the Scheme is indicated on map (See Figure EC-AWS-026).

6.37.8 The total area of ancient woodland affected by construction of the Scheme at Park Hall Wood is 0.7ha. This includes 0.35ha that will be lost due to construction of the Water Orton Cutting. The remaining areas are affected by tree management works and/or severance from the main body of woodland.

Compensatory measures

6.37.9 Table 40 provides a summary of the compensatory measures that are proposed in response to the expected effects on Park Hall Wood

Table 40.Ancient woodland strategy summary for Park Hall Wood

Woodland	Park Hall Wood
CFA	CFA 25
Status	Ancient semi-natural woodland and Site of Importance for Nature Conservation (SINC)

Description	**Extent of habitat in category (ha)**
Direct loss of ancient woodland (ha)	**0.4**
Area of ancient woodland located within the Hybrid Bill limits that will be retained, and not utilised during either construction or operation (ha)	**5.5**[42]
Area of receptor site for ancient woodland soils (ha)	**0.5**
Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor) (ha)	**3.5**
Enhancement of existing ancient woodland (ha)	**0.3**
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland	**0**

Translocation of ancient woodland soils

6.37.10 The woodland soils from the part of Park Hall Wood permanently impacted by the Scheme will be translocated to suitable receptor site(s).

6.37.11 The receptor area identified for the main ES is 0.5ha of existing grassland between the nearby Parkhill Wood and Langley Hill Wood (See Figure EC-AWS-026).. This area comprises tall grassland with patches of tall ruderal vegetation that is characteristic of NVC plant community, MG1 *Arrhenatherum elatius* grassland, which occurs on a gentle slope of approximately 5°. At this location the grassland is relatively species-poor and comprises false-

[42] 5.5ha area refers to Langley Hill Wood and Parkhill Wood which are both retained and unaffected by the scheme.

oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), common bent (*Agrostis capillaris*), creeping thistle (*Cirsium arvense*), broad-leaved dock (*Rumex obtusifolius*) and common nettle .

6.37.12 The grassland between the nearby Parkhill Wood and Langley Hill Wood provides suitable and similar conditions to the impacted area of Park Hall Wood and improves connectivity between the two woodlands areas. The soil here has a natural profile and the subsoil is similar in type and depth to that of the woodland being lost at Park Hall Wood. This location will also be available early in the construction programme and at low risk of subsequent disturbance or modification during construction and operational phases of the Scheme. Although this is a smaller area than the 0.7ha to be lost, there is considered sufficient capacity for the likely volume of recoverable soils, especially as it may be feasible to retain more ancient woodland in-situ following detail design

Soil conditions

6.37.13 The soils at the Park Hall Wood donor site have a very thin humic layer (approximately 10 mm), which is probably a consequence of soil creep on the steep slope beneath which is a fine sandy clay loam to 300 mm depth and a very dry clay loam between 300 mm and 1m depth.

6.37.14 The soils at the receptor site between Parkhill Wood and Langley Hill Wood comprise a thin humified layer of 20 mm with clay loam topsoil between the surface and 300 mm depth and a very dry clay loam with occasional small pebbles between 300 mm and 1 m depth.

Woodland planting

6.37.15 Woodland planting will take place either side of the western end of Water Orton Cutting (total of approximately 0.7ha split between three separate land parcels) and also between Park Hall Wood SINC and the B4118 Birmingham Road (approximately 2.8ha).

Enhancement of ancient woodland

6.37.16 Enhancement works (involving lopping, pollarding and/or coppicing but not topsoil scrapping or tree root extraction) to facilitate construction will affect 0.3ha. This includes 0.2ha to the north of the cutting and 0.1ha to the south. The 0.1ha area was assessed as being lost in the main ES due to likely disturbance, fragmentation and edge effects. The tree management areas will be demarcated with high visibility barrier netting to prevent construction traffic moving across the two locations.

7 Conclusions and route wide summary

7.1.1 Table 41 provides a route-wide summary of the impacts of Phase One of HS2 on ancient woodland and the associated compensatory provision in response to these losses.

7.1.2 The route wide assessment within the SES3 and AP4 ES reported that the scheme was expected to result in the loss of 30.1ha of ancient woodland. Cumulatively these losses were identified as a residual adverse effect on an irreplaceable resource significant at the national level.

7.1.3 Following updates made post completion of the SES and AP process, the outputs of the strategy show that overall Phase One of HS2 is expected to result in losses of approximately 29.4ha of ancient woodland, a reduction of 0.8ha from that reported in the SES3 and AP4 ES. A total of 32 ancient woodlands will be subject to direct loss of habitat as a consequence of the scheme. This remains a residual adverse effect on an irreplaceable resource significant at the national level.

7.1.4 The 29.4ha total area of ancient woodland loss consists of 24.8ha of ancient semi-natural woodland and 4.6ha of Plantation on Ancient Woodland (PAWS). The largest scale loss from any single ancient woodland is 3.6ha from Broadwells Wood (CFA 18), which consists of 3.2ha of ancient semi-natural woodland and 0.4ha PAWS.

7.1.5 Of the 32 ancient woodlands where direct losses will occur, at 19 of these the area of ancient woodland that will be lost as a consequence of the scheme is less than 1ha. This includes 12 ancient woodlands where the area of ancient woodland lost will be less than 0.5ha.

7.1.6 In addition to the 29.4ha of ancient woodland that will be directly impacted by the scheme, there is a further 11.9ha of ancient woodland that has been identified within Hybrid Bill plans as land potentially required for the construction and operation of the scheme. However, HS2 Ltd has confirmed that these areas will be retained, and no works are to be undertaken in these areas of woodland.

7.1.7 No additional ancient woodlands (i.e. beyond the 32 directly affected) are expected to be subject to significant adverse effects.

7.1.8 All updated figures are based on the assumptions detailed in this document, and estimates are made in advance of the detailed design of the scheme.

Table 41. Ancient woodland strategy summary: habitat areas (ha) of each category

Woodland name	Community Forum Area (CFA) Number	Direct loss of ancient woodland (ha) (All ancient semi-natural unless otherwise stated)	Areas of ancient woodland within the land covered by the Bill that will be retained (ha)	Area of receptor site for ancient woodland soils (ha)	Areas of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soils receptor) (ha)	Area of enhancement and/or restoration of ancient woodland (ha)	Area of enhancement and/or restoration non-ancient woodland (ha)
Newyear's Green Covert	CFA6	0.0	2.2	-	-	-	-
Pinnocks Wood	CFA 7	0.0	0.3	-	-	-	-
Ranston Covert and Battlesford Wood	CFA 7	0.1	0.0	0.1	16.9	-	-
Jones' Hill Wood	CFA 10	0.7	0.0	0.7	4.1	-	-
Woodland along the bridleway adjacent to the landfill south-east of Calvert	CFA 12	1.4	0.0	1.4	24 (combined areas of new planting in response to losses in 5 ancient woodlands in CFA12/CFA13.	-	-
Woodland opposite Decoypond Wood	CFA 13	0.9	-	0.9		-	-
Decoypond Wood	CFA 13	1.1	-	1.1		-	-
Woodland to the south of Calvert west of the route	CFA 13	0.1	-	0.1		-	-
Woodland to the south of Calvert east of the route	CFA 13	0.5	-	0.5		-	-
Fox Covert (Whitfield)	CFA 14	0.0	-	-	-	-	-

Woodland name	Community Forum Area (CFA) Number	Direct loss of ancient woodland (ha) (All ancient semi-natural unless otherwise stated)	Areas of ancient woodland within the land covered by the Bill that will be retained (ha)	Area of receptor site for ancient woodland soils (ha)	Areas of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soils receptor) (ha)	Area of enhancement and/or restoration of ancient woodland (ha)	Area of enhancement and/or restoration non-ancient woodland (ha)
Mossycorner Spinney	CFA 14	0.3	-	0.3	3.6	-	-
Halse Copse South	CFA 15	0.3	-	0.3	9.8	-	-
Fox Covert (Glyn Davies Wood)	CFA 15	1.3	-	1.4	7.7	-	-
Burnt Firs	CFA17	1.1	0.0	1.2	4.7	0.0	0.0
South Cubbington	CFA17	2.0 (all PAWS)	1.5	2.0	6.7	0.0	0.0
Unnamed woodland south of the B4115 Ashow Road in Stoneleigh	CFA18	0.2	0.0	0.2	0.2	0.0	0.0
Crackley Wood North, including Crackley Wood North Extension	CFA18	1.0	0.0	1.0	0.9 (combined provision for Birches Wood and Crackley Wood North & Extension)	0.0	0.0
Birches Wood	CFA18	0.6	0.0	0.6		0.0	0.0
Roughknowles Wood	CFA18	0.4 (all PAWS)	0.0	0.4	0.6	0.0	0.0
Broadwells Wood	CFA18	3.6 (including 0.4ha PAWS)	0.7	3.3	5.7	8.3 (including compensation for Little Poors Wood , and Black Waste Wood).	0.0
Black Waste Wood	CFA18	0.6	0.0	0.0	0.2		0.0
Little Poors Wood	CFA18	0.2	0.0	0.0	0.0		0.0

Woodland name	Community Forum Area (CFA) Number	Direct loss of ancient woodland (ha) (All ancient semi-natural unless otherwise stated)	Areas of ancient woodland within the land covered by the Bill that will be retained (ha)	Area of receptor site for ancient woodland soils (ha)	Areas of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soils receptor) (ha)	Area of enhancement and/or restoration of ancient woodland (ha)	Area of enhancement and/or restoration non-ancient woodland (ha)
Sych Wood	CFA20	0.2	0.0	0.1	2.1	0.0	0.0
North Wood	CFA20	1.8 (including 0.3ha PAWS)	0.0	1.8	0.7	0.0	0.0
Walker's Spinney	CFA20	0.1	0.0	0.1	0.0	0.0	0.0
Unnamed copse off Drayton Lane	CFA20	0.2	0.0	0.2	0.2	0.0	0.0
Roundhill Wood	CFA21	1.3	0.0	1.1	10.9 (combined response to Rookery and Roundhill Wood losses)	0.0	0.0
Rookery	CFA21	1.4	0.1	1.7		0.0	0.0
Fulfen Wood	CFA22	0.4	0.6	0.4	0.9	0.0	0.0
Little Lyntus Wood	CFA22	1.4	0.8	2.2 (including soils from Little Lyntus Wood and Big Lyntus Wood)	1.4	0.0	0.0
Big Lyntus Wood	CFA22	0.8 (all PAWS)	0.0		0.4	0.0	0.0
Ravenshaw Wood	CFA22	1.7 (including 0.7ha of PAWS)	0.0	1.7	2.7	8.7 (including Ravenshaw Wood and the Slaish)	13.0 (including Ravenshaw Wood and the Slaish)
Slaish Wood	CFA22	0.0	0.0	0.0	0.0		

Woodland name	Community Forum Area (CFA) Number	Direct loss of ancient woodland (ha) (All ancient semi-natural unless otherwise stated)	Areas of ancient woodland within the land covered by the Bill that will be retained (ha)	Area of receptor site for ancient woodland soils (ha)	Areas of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soils receptor) (ha)	Area of enhancement and/or restoration of ancient woodland (ha)	Area of enhancement and/or restoration non-ancient woodland (ha)
Vicar's Coppice	CFA22	0.6	<0.1	0.5	4.1	0.0	0.0
John's Gorse	CFA22	2.7	<0.1	1.7	0.5	0.0	0.0
Park Hall Wood	CFA25	0.4	5.5	0.5	3.5	0.3	0
	TOTALS	**29.4 (including 4.6ha PAWS)**	**11.9**	**27.5**	**112.5**	**17.3**	**13**

7.2 Compensation in response to effects on ancient woodland

7.2.1 Ancient woodland is an irreplaceable resource. Where effects on ancient woodland cannot be reasonably avoided then HS2 Ltd has committed to provide a range of compensation measures.

7.2.2 A route wide summary of the compensation measures currently proposed in response to effects on ancient woodland habitats is as follows (see Section 7 for further details):

- 27.5ha of ancient woodland soils[43] to be translocated to receptor sites;
- 112.5ha of new woodland planting (N.B. this is in addition to the areas identified as receptor sites for ancient woodland soils);
- 17.3ha of enhancement of ancient woodland; and
- 13.0ha of enhancement of non-ancient woodland habitat.

7.2.3 The above measures are considered a robust and proportionate response to the loss of ancient woodland that is expected to occur as a consequence of the scheme and

7.2.4 Natural England stated within their review of the HS2 Ltd no net loss in biodiversity calculation that the levels of compensation provision that HS2 committed to within the ES in response to impacts on ancient woodland is '*at the upper end of current practice and may well exceed that provided by other development and infrastructure projects*'. At this time ancient woodland was still considered in the no net loss calculation.

7.2.5 It should be noted that the totals detailed in paragraph 7.2.2 only take into account those areas of compensation that have been provided with a primary or joint purpose of compensating the loss of ancient woodland. They are therefore in addition to the areas of mitigation and compensation planting which are considered within HS2 Ltd's no net loss calculation for replaceable habitats (in prep.).

7.2.6 In addition to the totals reported in paragraph 7.2.2, other ecology and landscape planting included as part of the scheme (and which is considered within the no net loss calculation fore replaceable habitats) are expected to result in a net gain in the extent of woodland and scrub habitat of approximately 550ha.

Department for Transport response to Natural England's review of HS2 Ltd's 'no net loss in biodiversity' metric

7.2.7 In response to Natural England's review of HS2 Ltd's no net loss in biodiversity metric the DfT has committed to increasing its compensatory response to the expected loss of ancient woodland,. As a consequence HS2 Ltd will:

- seek to maximise woodland planting on land bought in relation to HS2 – initial

[43] These areas are expected to be planted following soil translocation in accordance with the Ecology Technical Standard.

estimates suggest that this will be up to an additional 50 hectares; and

- establish a £5 million fund to support third party woodland planting projects to provide woodland enhancement beyond what is required under standing advice from Natural England and the Forestry Commission.

7.3 Moving forward to detailed design

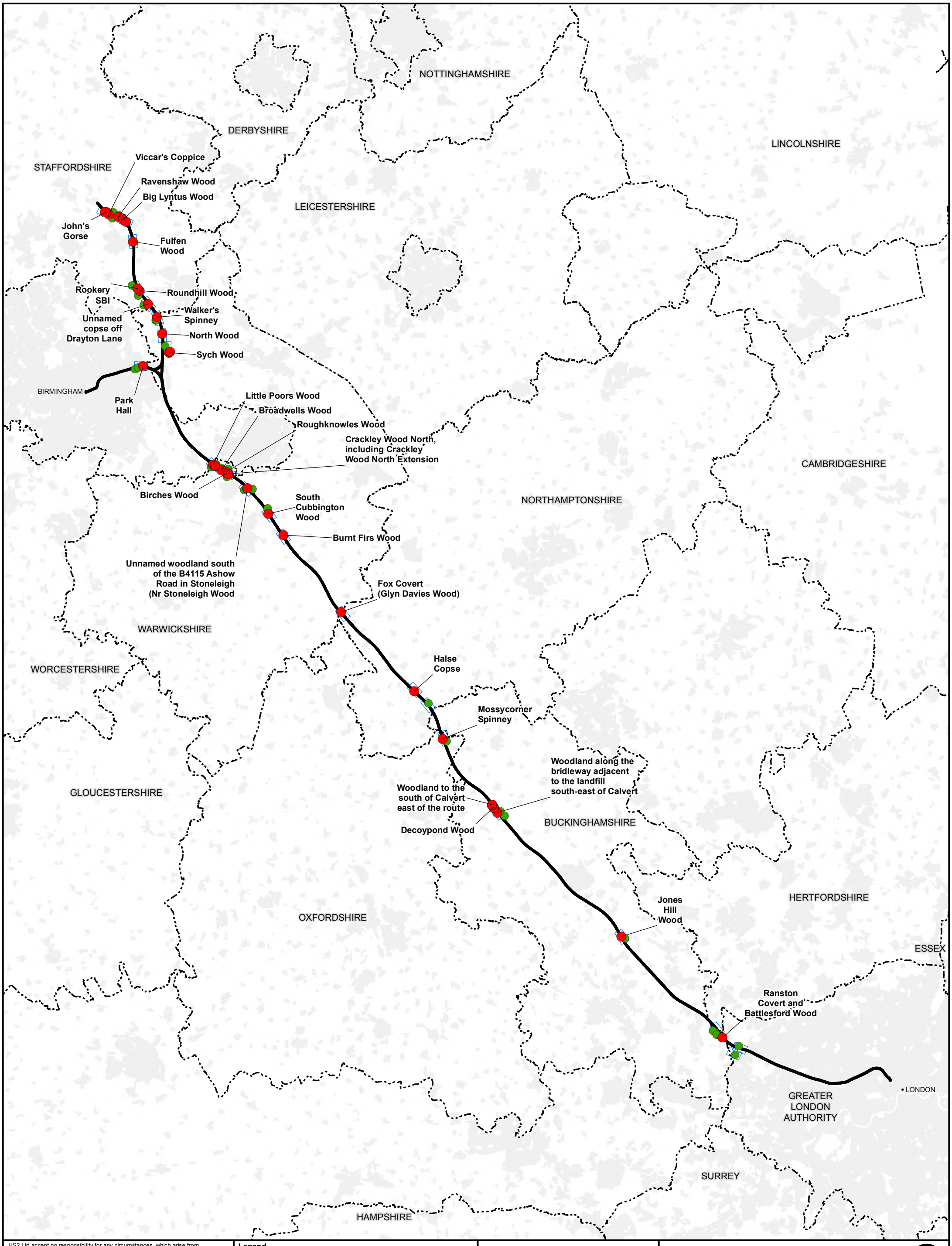
7.3.1 HS2 Ltd recognise that ancient woodland is an irreplaceable resource, and during the detailed design of the scheme will continue to make efforts to reduce the area of ancient woodland that will be lost as a consequence of the scheme.

7.3.2 In accordance with the draft Code of Construction Practice (CoCP) and the Environmental Minimum Requirements (EMR's), during detailed design and construction efforts will continue to be made to seek to avoid or further reduce the impacts of the scheme. For example through use of innovative design solutions (e.g. increasing cutting gradients), and construction methods that reduce the area of ancient woodland that is lost as a consequence of the scheme (e.g. end-on working). As a consequence the 29.3ha of ancient woodland losses currently expected should be considered to be a worst-case figure which may be reduced during detailed design.

7.3.3 As detailed design is undertaken, further information will be gathered relating to both the areas of ancient woodland that will be affected, and proposed receptor sites. This will include further baseline vegetation survey in those areas where it has not yet been possible to undertaken these, and detailed soil survey of both donor and proposed receptor sites.

7.3.4 As further information becomes available HS2 Ltd will continue to work with local landowners, Natural England and other relevant bodies during detailed design to refine the compensation strategy for each woodland. Where appropriate this may include consideration of alternative (and available) locations for compensatory provision put forward by HS2 Ltd or other landowners. For example, opportunities that may allow consolidation of smaller fragments of compensation planting within a larger area of habitat creation that will be easier to manage and conserve in the long term.

Appendix 1: Figures



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Legend

- Route centreline
- Map sheet showing ancient woodland
- Ancient woodland where habitat loss is expected to occur
- Ancient woodland reffered to in the strategy but not directly impacted by HS2

EC-AWS-000

Ancient Woodland Strategy: Overview Map

Scale at A3: 1:500,000

0 4 8 12 16 Kilometres

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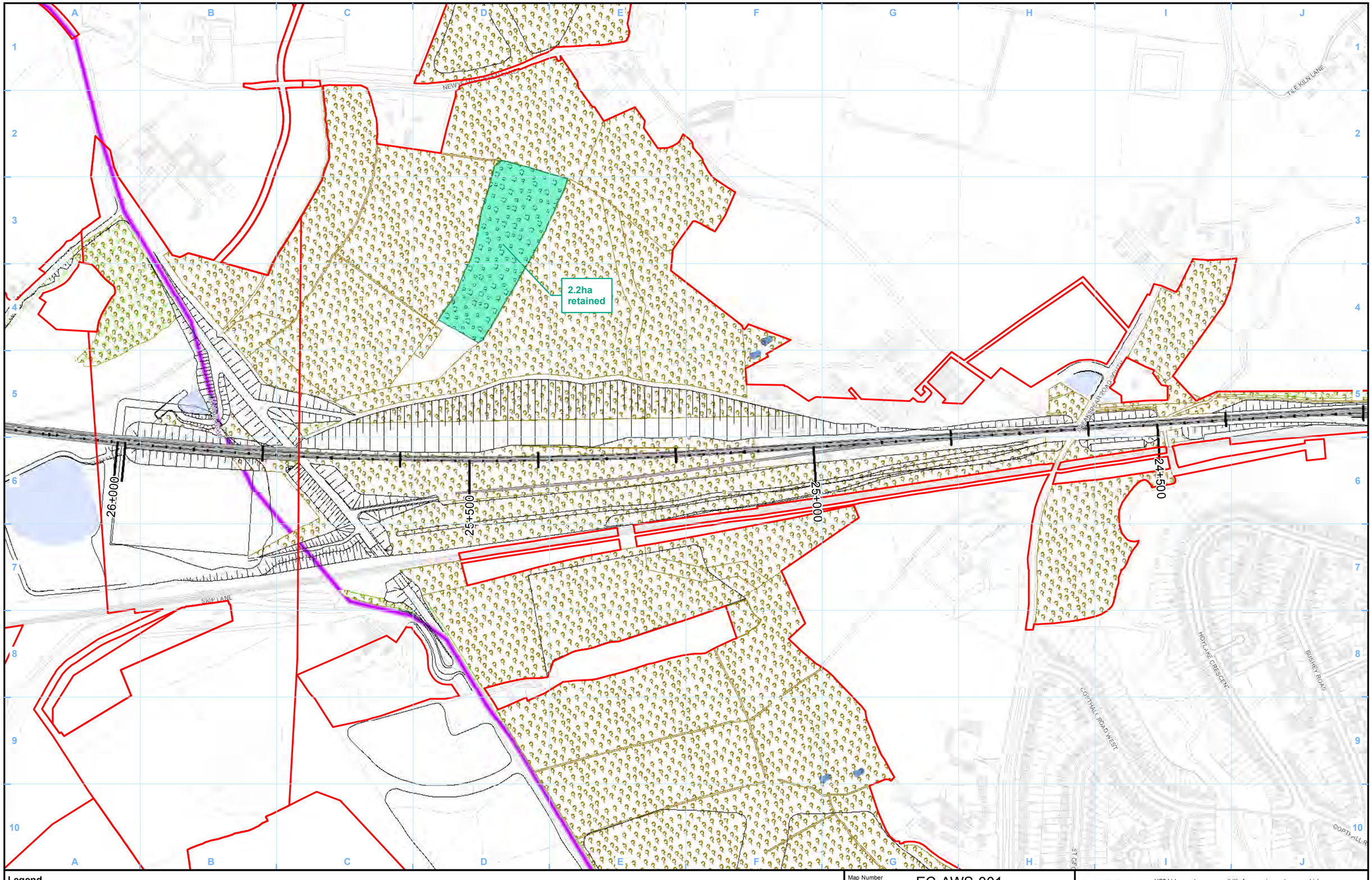

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-001

Map Name: Ancient Woodland Strategy: Newyears Green Covert

Community Area: CFA06 South Ruislip to Ickenham

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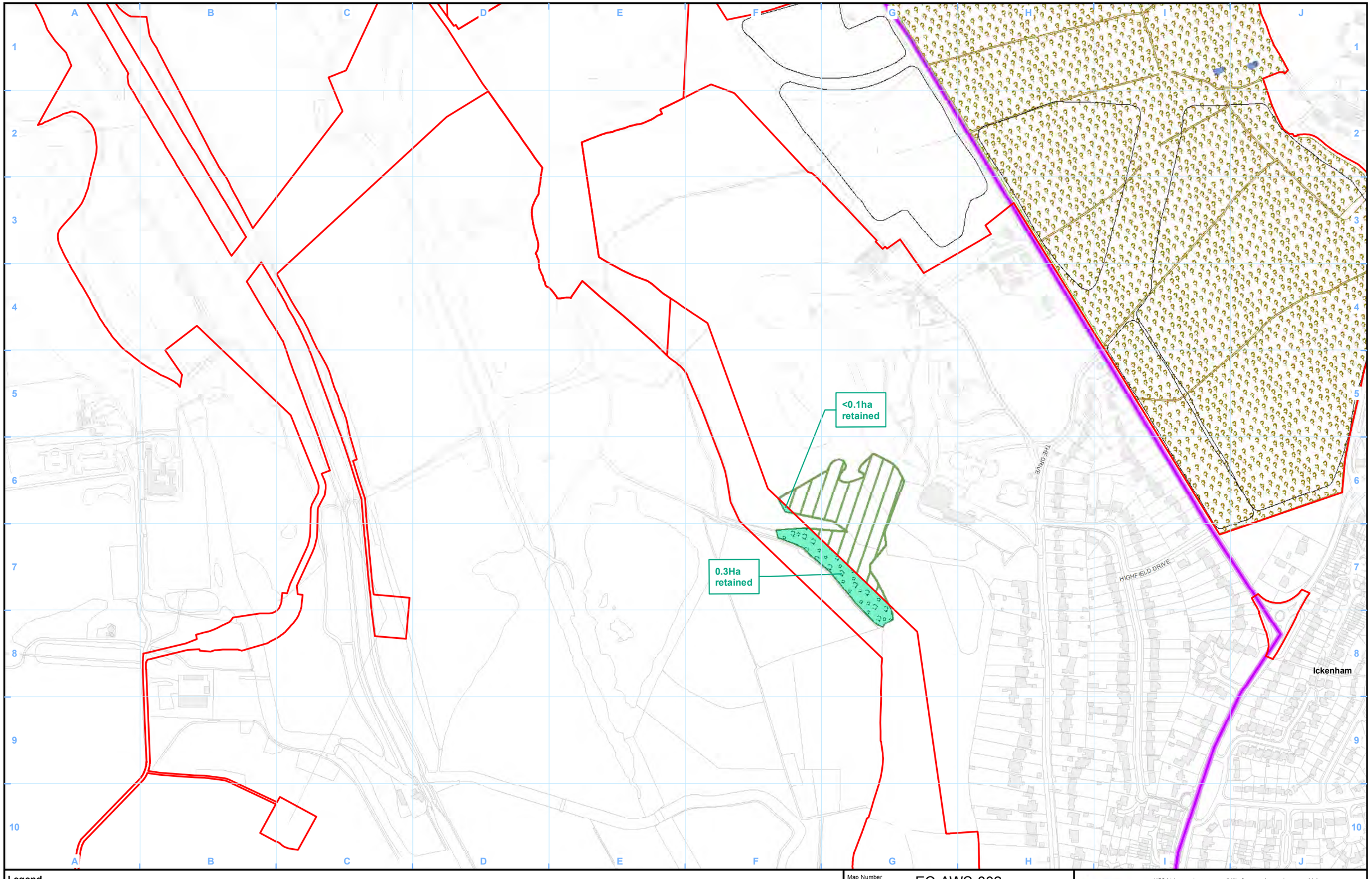

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-002

Map Name: Ancient Woodland Strategy: Pinnocks Wood

Community Area: CFA07 Colne Valley

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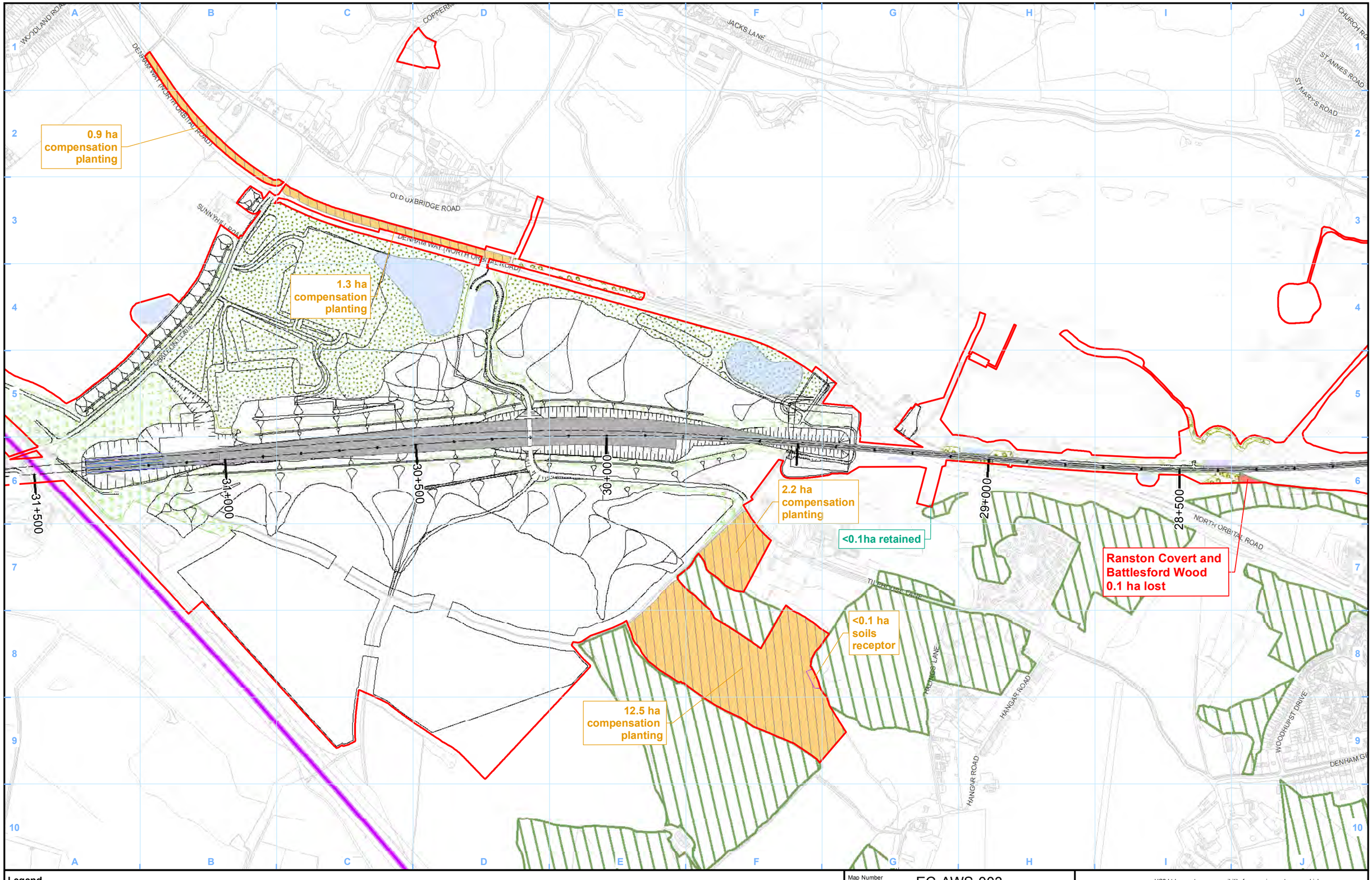

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-003

Map Name: Ancient Woodland Strategy: Ranston Covert and Battlesford Wood

Community Area: CFA07 Colne Valley

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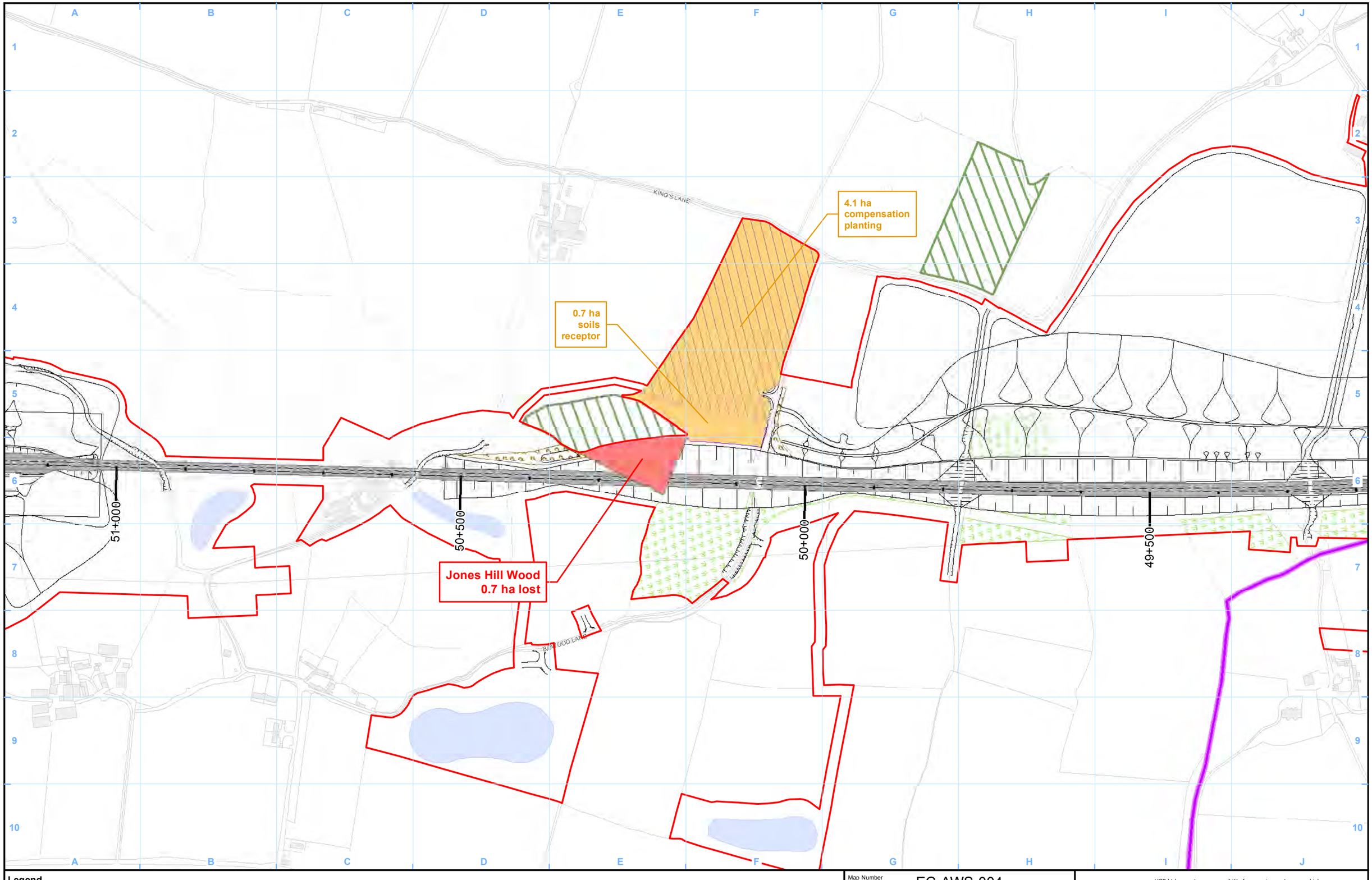

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-004

Map Name: Ancient Woodland Strategy: Jones Hill Wood

Community Area: CFA10 Dunsmore, Wendover & Halton

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2.6 ha
soils receptor to receive soils from affected areas of the following woodlands:
- Decoypond Wood;
- Woodland to the south of Calvert east of the route;
- Woodland to the south of Calvert west of the route;
- Woodland opposite Decoypond Wood

Woodland to the south of Calvert east of the route
0.5 ha lost

3.9 ha compensation planting

5.9 ha compensation planting

11.0 ha compensation planting

1.4 ha receptor for soils from woodland along the bridleway adjacent to the landfill south-east of Calvert

Decoypond Wood
1.1 ha Lost

78+500

78+000

77+500

76+000

75+500

Woodland to the south of Calvert west of the route
0.1 ha lost

Woodland opposite Decoypond wood
0.9 ha lost

Woodland along the bridleway adjacent to the landfill south-east of Calvert
1.4 ha lost

3.2 ha compensation planting

SANDSTONE CLOSE
KILN CLOSE
COTSWOLDS WAY
TUDORS CLOSE
LAWN HILL

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-005

Map Name: Ancient Woodland Strategy: Woodlands south of Calvert and in the vicinity of Sheephouse Wood SSSI

Community Area:
CFA12
Waddesdon & Quainton

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0 90 180 270 360
Metres

Doc Number:

Date: 23/03/17

Fox Covert (Whitfield) - No loss of ancient woodland will occur).

97+500

97+000

96+500

96+000

RADSTONE ROAD

A3

M40

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-006

Map Name: Ancient Woodland Strategy: Fox Covert (Whitfield)

Community Area: CFA14 Newton Purcell to Brackley

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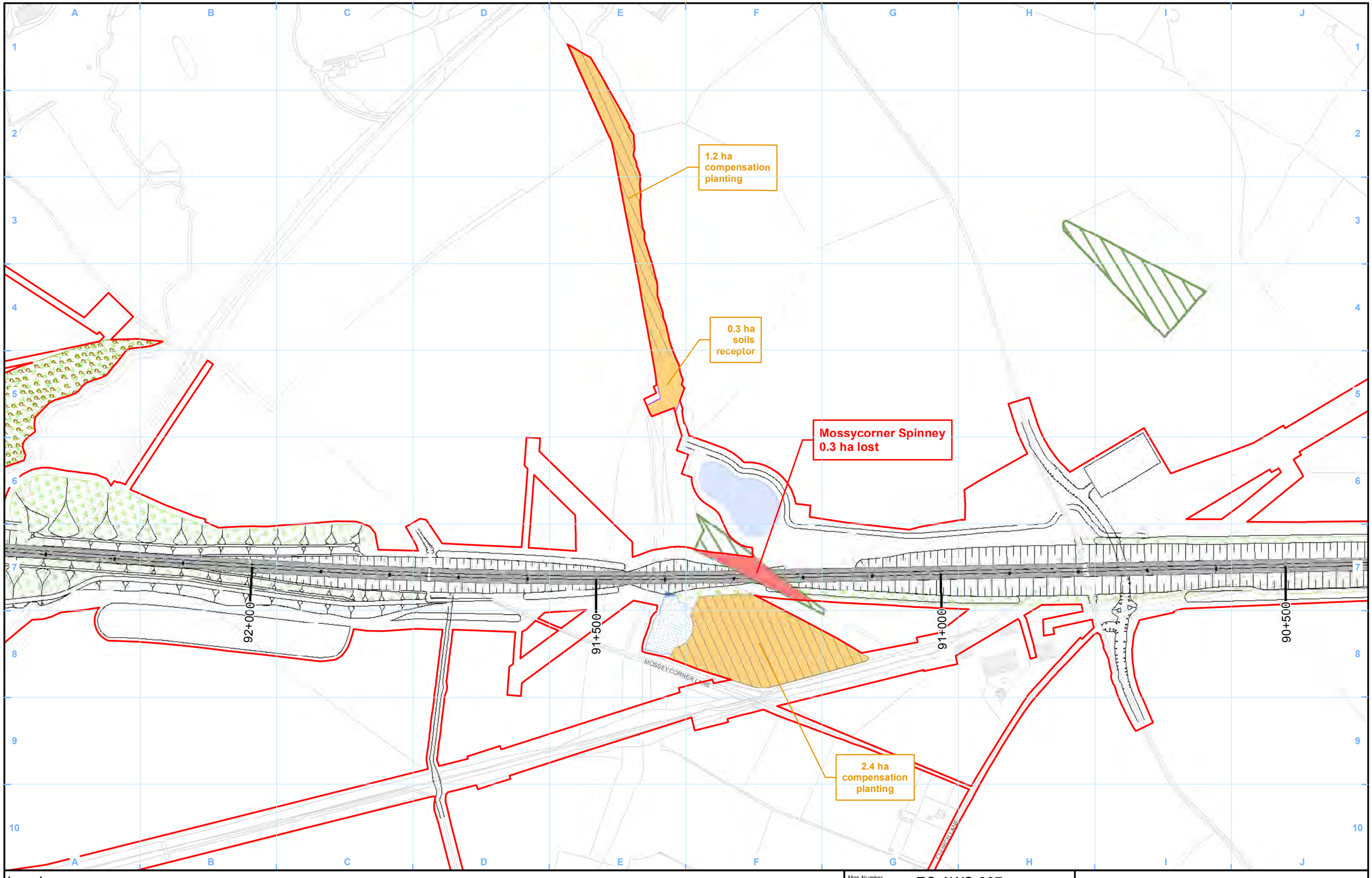

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-007

Map Name: Ancient Woodland Strategy: Mossycorner Spinney

Community Area: CFA14 Newton Purcell to Brackley

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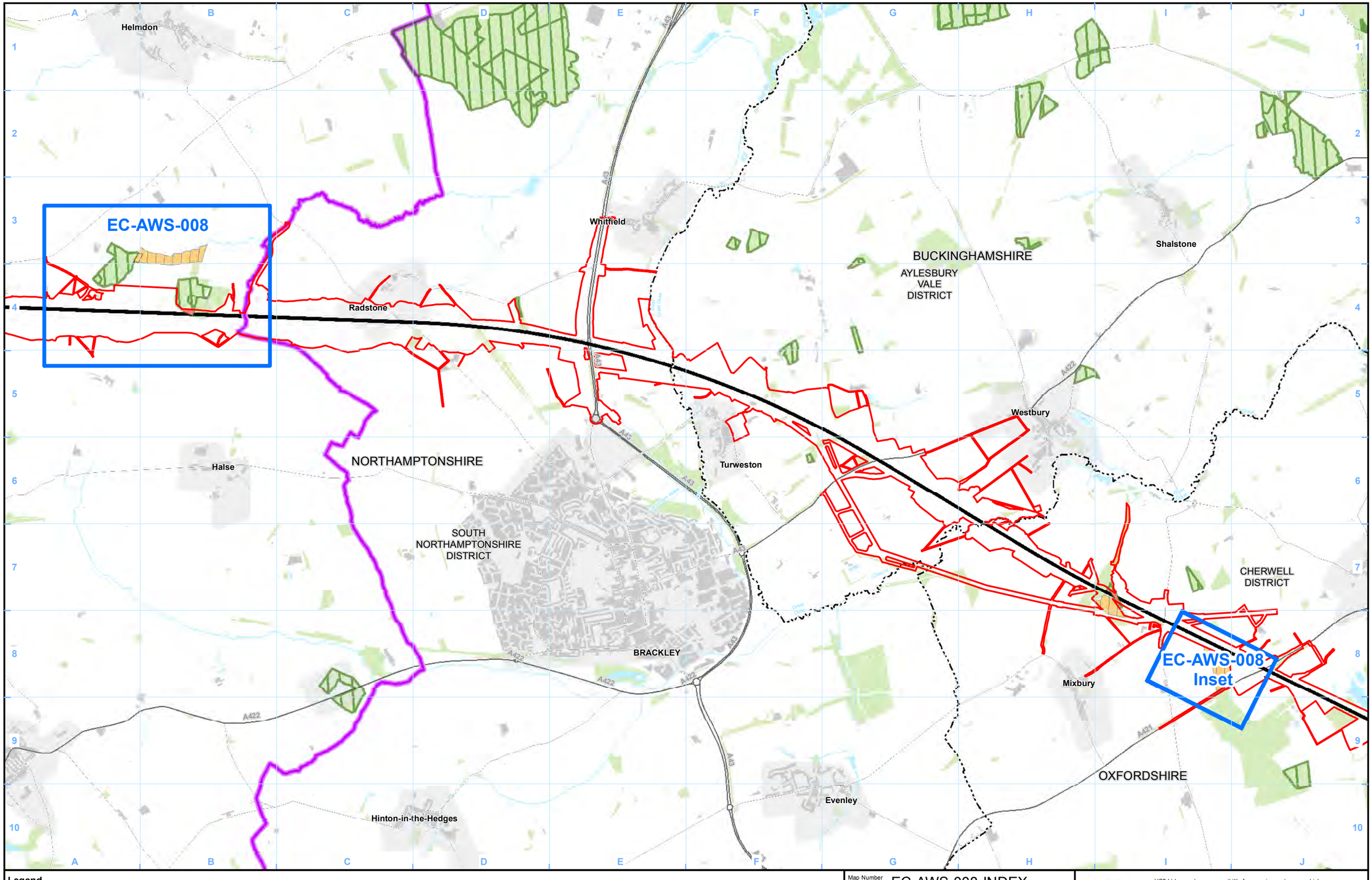

Legend

- Route in tunnel
- Route on surface
- Community forum boundary
- Land potentially required during construction
- County boundary
- District/Borough boundary
- Woodland
- Water
- Areas of ancient woodland located outside of the Hybrid Bill limits that will not be impacted
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)

Map Number: EC-AWS-008-INDEX

Map Name: Ancient Woodland Strategy: Index Map for Halse Copse and associated compensation

Community Area:

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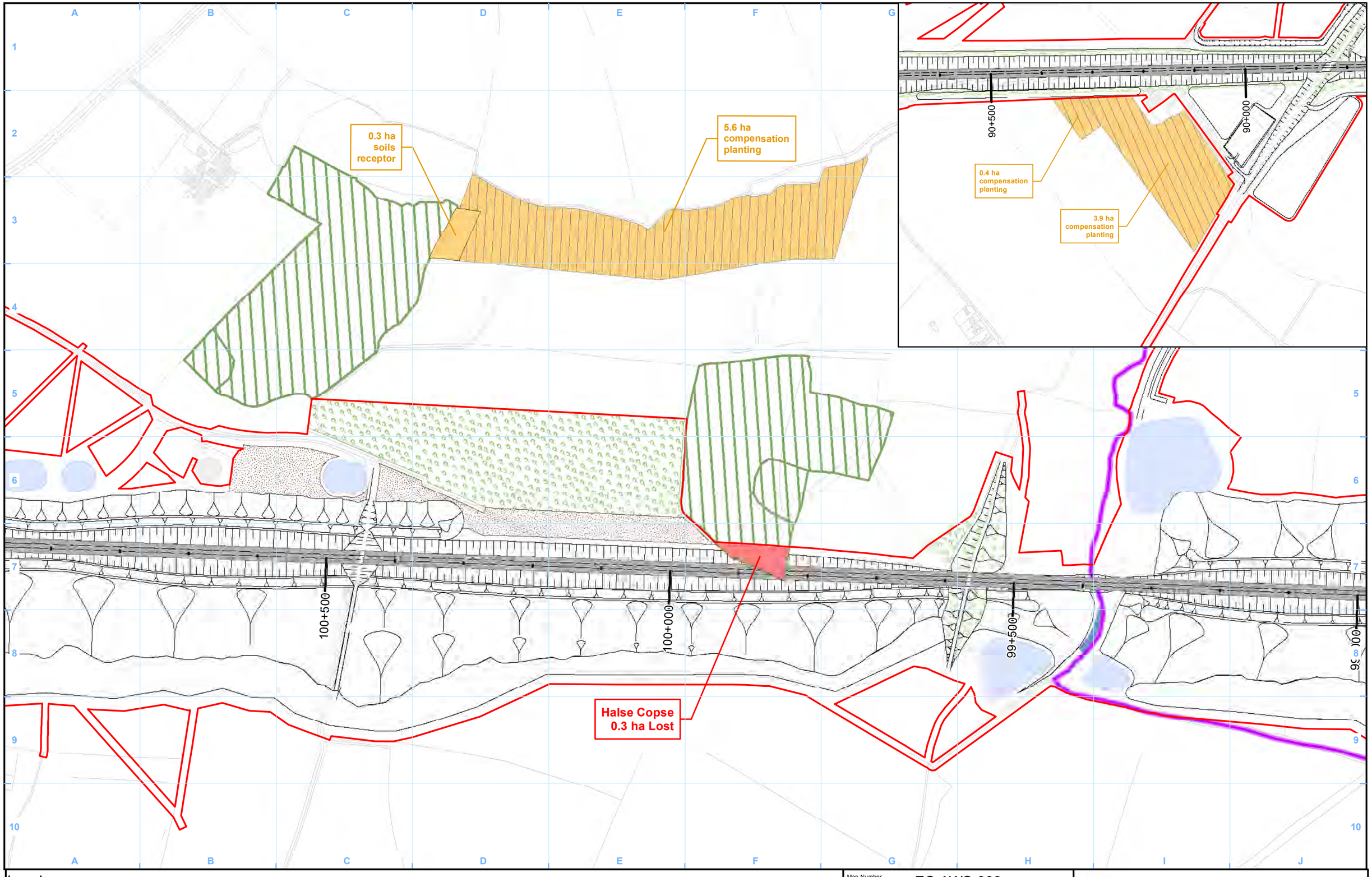

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will not be impacted
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-008

Map Name: Ancient Woodland Strategy: Halse Copse

Community Area: CFA15 Greatworth to Lower Boddington

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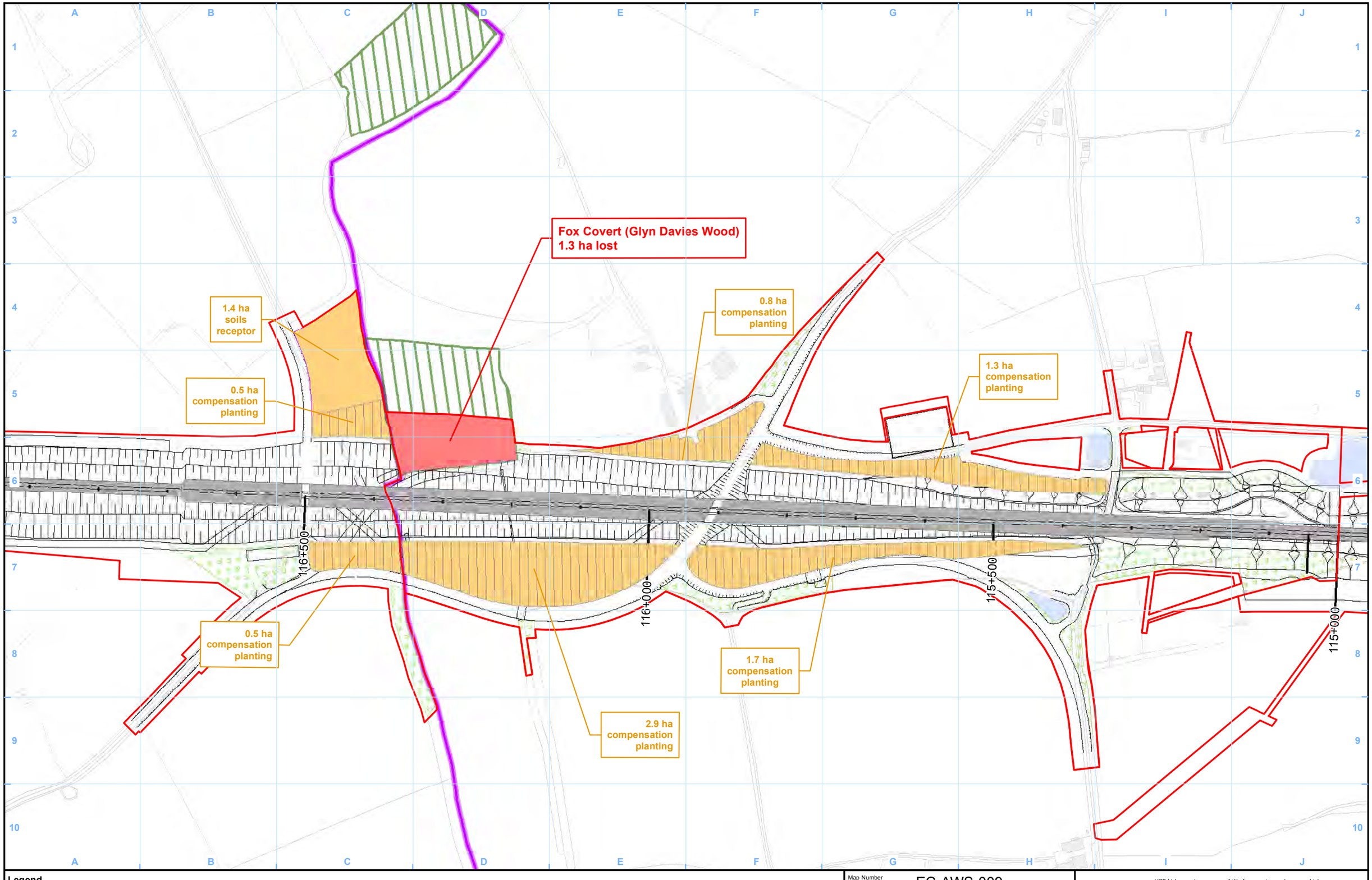
Date: 15/03/17



Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-009

Map Name: Ancient Woodland Strategy: Fox Covert (Glyn Davies Wood)

Community Area: CFA15 Greatworth to Lower Boddington

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Burnt Firs Wood
1.1 ha lost

1.2 ha soils receptor

4.7 ha compensation planting

131+500

131+000

130+500

130+000

FOSSE WAY

Legend

- Rail alignment
- Tunnels external extent
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- Engineering earthworks
- Rail alignment formation
- Tunnel portal
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- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-010

Map Name: Ancient Woodland Strategy: Burnt Firs Wood

Community Area:
CFA17
Offchurch & Cubbington

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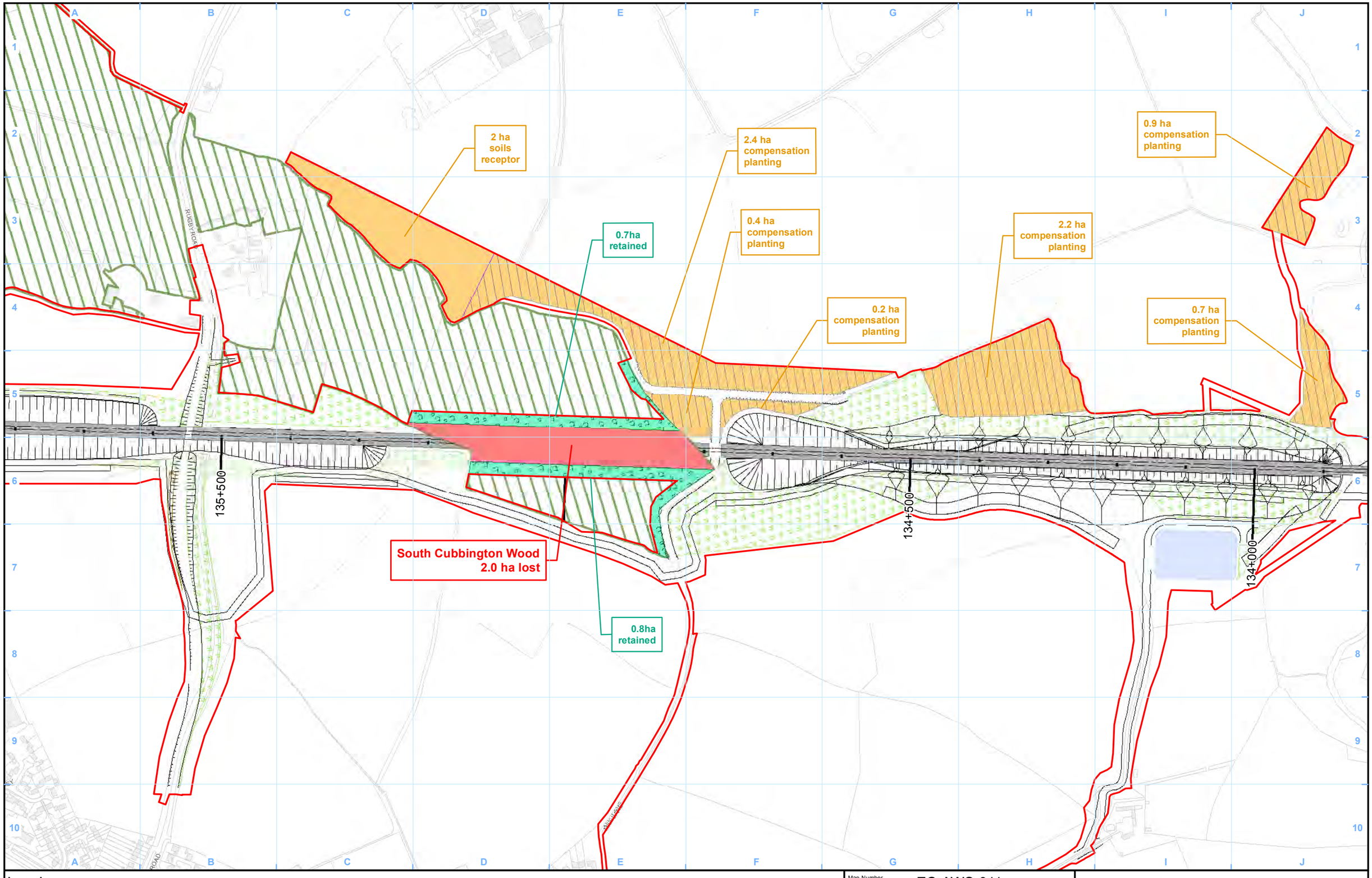
Date: 23/03/17



Legend

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- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
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- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-011

Map Name: Ancient Woodland Strategy: South Cubbington Wood

Community Area: CFA17 Offchurch & Cubbington

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Doc Number:

Date: 23/03/17

Ashow Road in Stoneleigh
(Nr Stoneleigh Wood)
0.2 ha lost

0.2
ha compensation
planting

0.2 ha soils
receptor

141+000

140+500

140+000

139+500

5TH STREET

6TH STREET

7TH STREET

8TH STREET

10TH STREET

AVENUE D

AVENUE E

AVENUE G

AVENUE M

AVENUE Z

CREW LANE

A46

THE CUNNERY

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
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- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-012

Map Name: Ancient Woodland Strategy: Unnamed woodland south of the B4115 Ashow Road in Stoneleigh (Nr Stoneleigh Wood)

Community Area:
CFA18
Stoneleigh, Kenilworth and Burton Green

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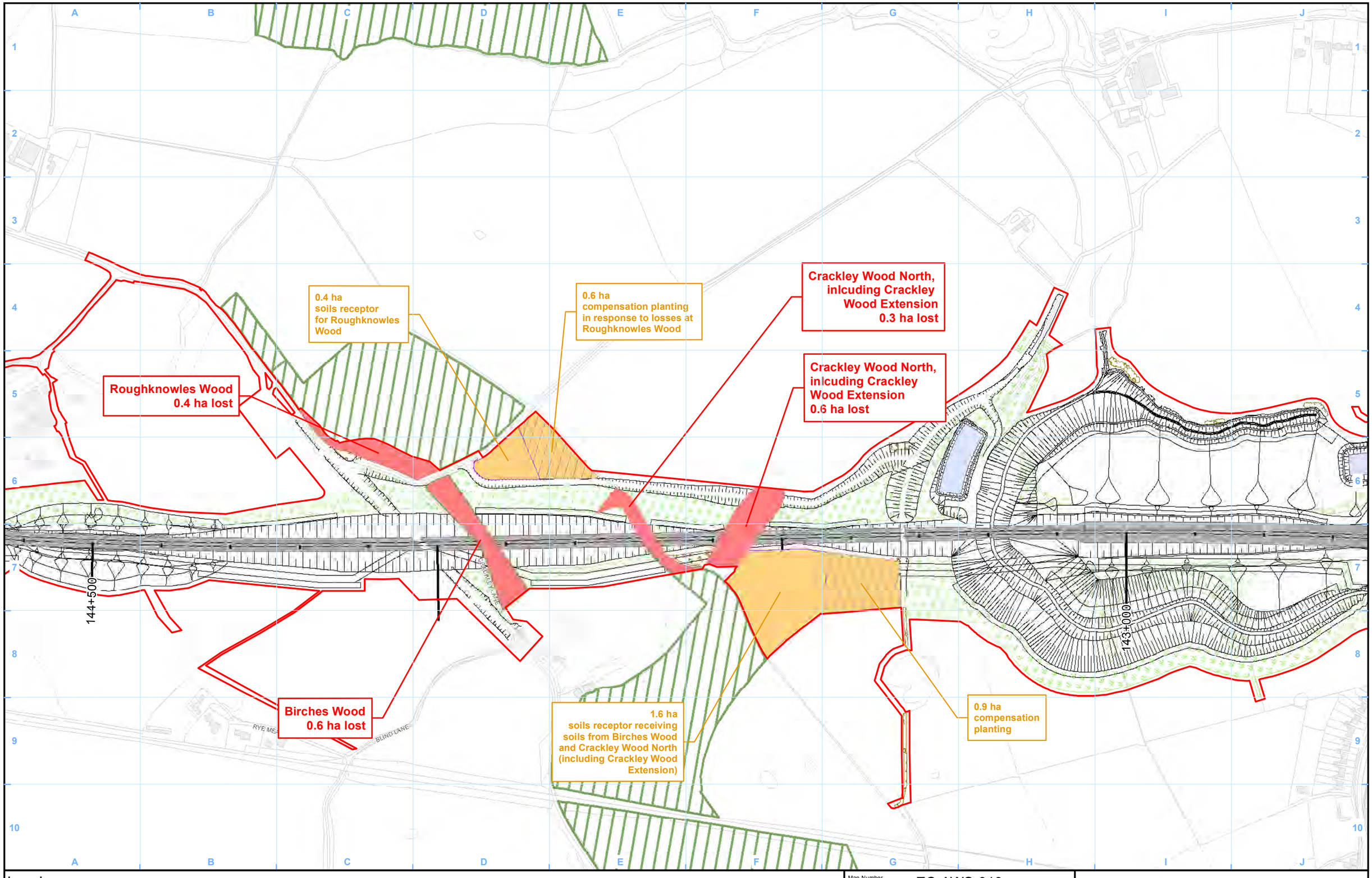
Date: 23/03/17



Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
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- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-013

Map Name: Ancient Woodland Strategy: RoughKnowles Wood, Birches Wood and Crackley Wood North, including Crackley Wood

Community Area: CFA18 Stoneleigh, Kenilworth and Burton Green

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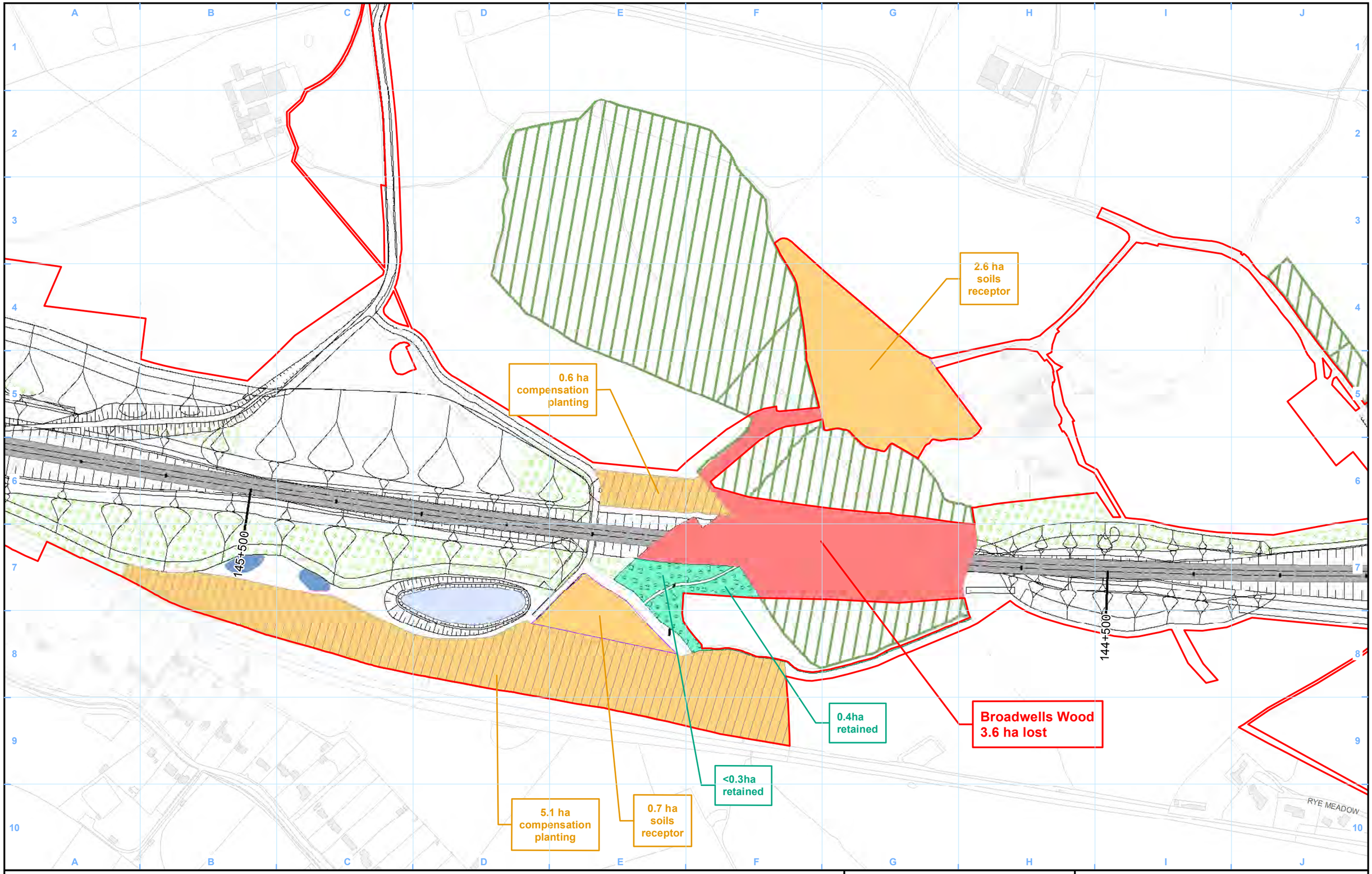

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
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- Landscape earthworks
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- Rail alignment formation
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- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-014

Map Name: Ancient Woodland Strategy: Broadwells Wood

Community Area: CFA18 Stoneleigh, Kenilworth and Burton Green

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0 40 80 120 160 Metres

Doc Number:

Date: 23/03/17

8.3 ha enhancement to compensate for losses at Black Waste Wood and Little Poors Wood.

0.2 ha compensation planting

Little Poors Wood 0.2 ha lost

Black Waste Wood 0.6 ha lost

147+000

146+500

146+000

145+500

HOB LANE

Burton Green

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Area of enhancement of existing ancient woodland (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-015

Map Name: Ancient Woodland Strategy: Little Poors Wood and Black Waste Wood

Community Area: CFA18 Stoneleigh, Kenilworth and Burton Green

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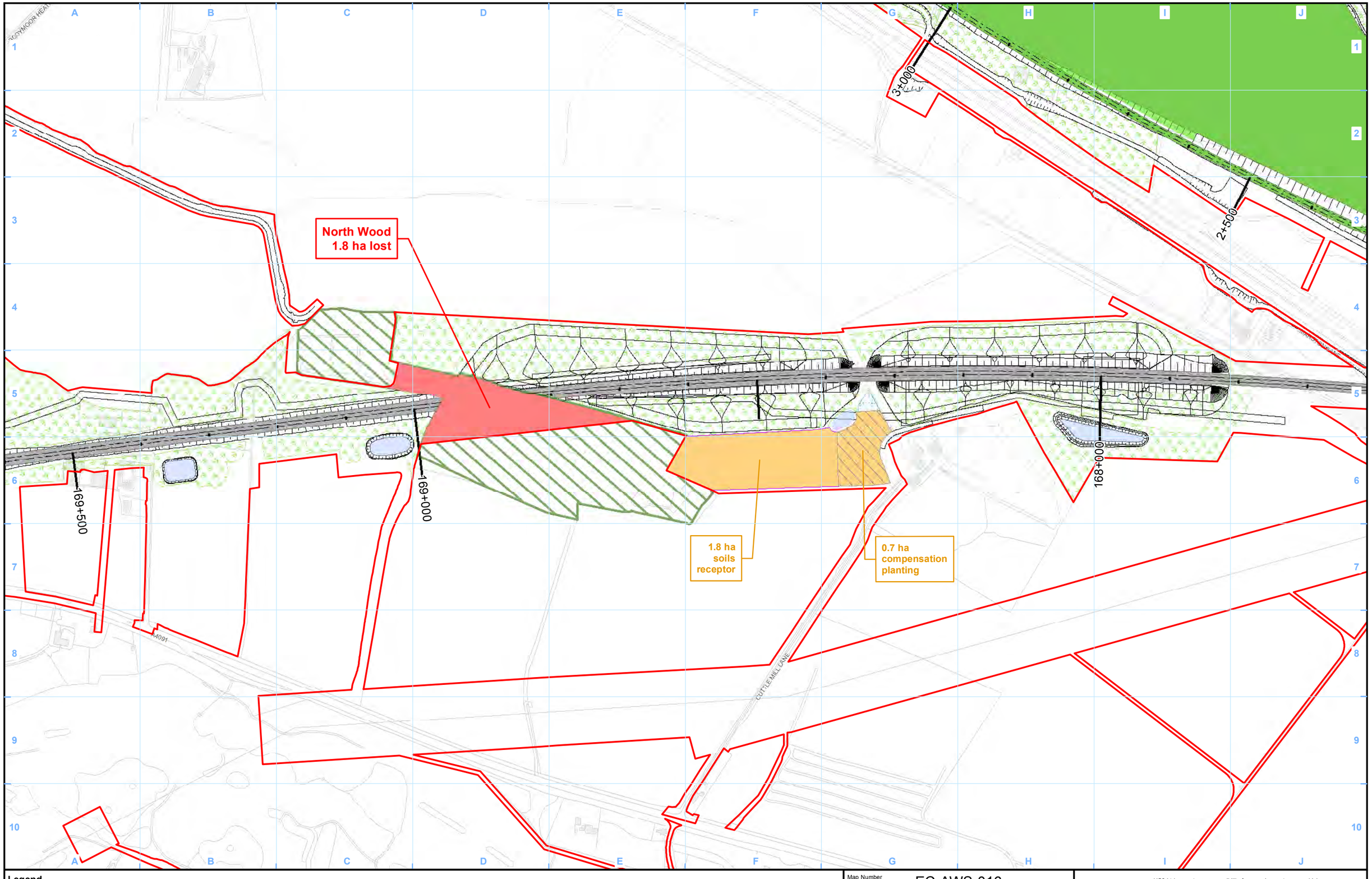

Legend

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- Community forum boundary
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- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
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- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-016

Map Name: Ancient Woodland Strategy: North Wood

Community Area: CFA20 Curdworth to Middleton

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Sych Wood
0.1 ha lost

Sych Wood
0.1 ha lost

Lea
Marston

2.1 ha
compensation
planting

0.1 ha
soils
receptor

2+500

2+000

1+500

1+000

166+500

166+000

0+500

Legend

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- Engineering earthworks
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- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-017

Map Name: Ancient Woodland Strategy: Sych Wood

Community Area:
CFA20
Curdworth to Middleton

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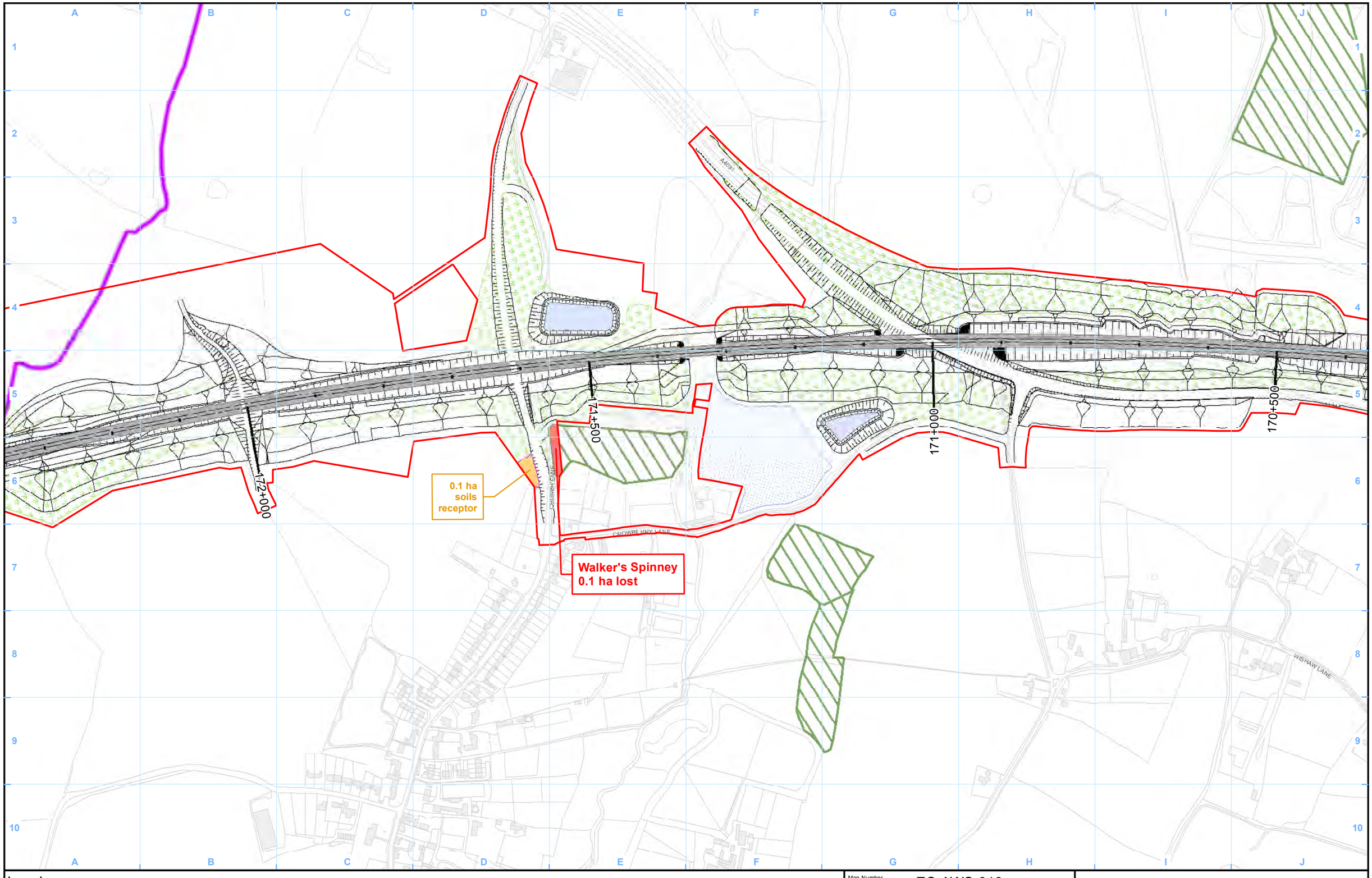

Legend

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- Engineering earthworks
- Rail alignment formation
- Tunnel portal
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- Area of receptor site for ancient woodland soils (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-018

Map Name: Ancient Woodland Strategy: Walker's Spinney

Community Area:
CFA20
Curdworth to Middleton

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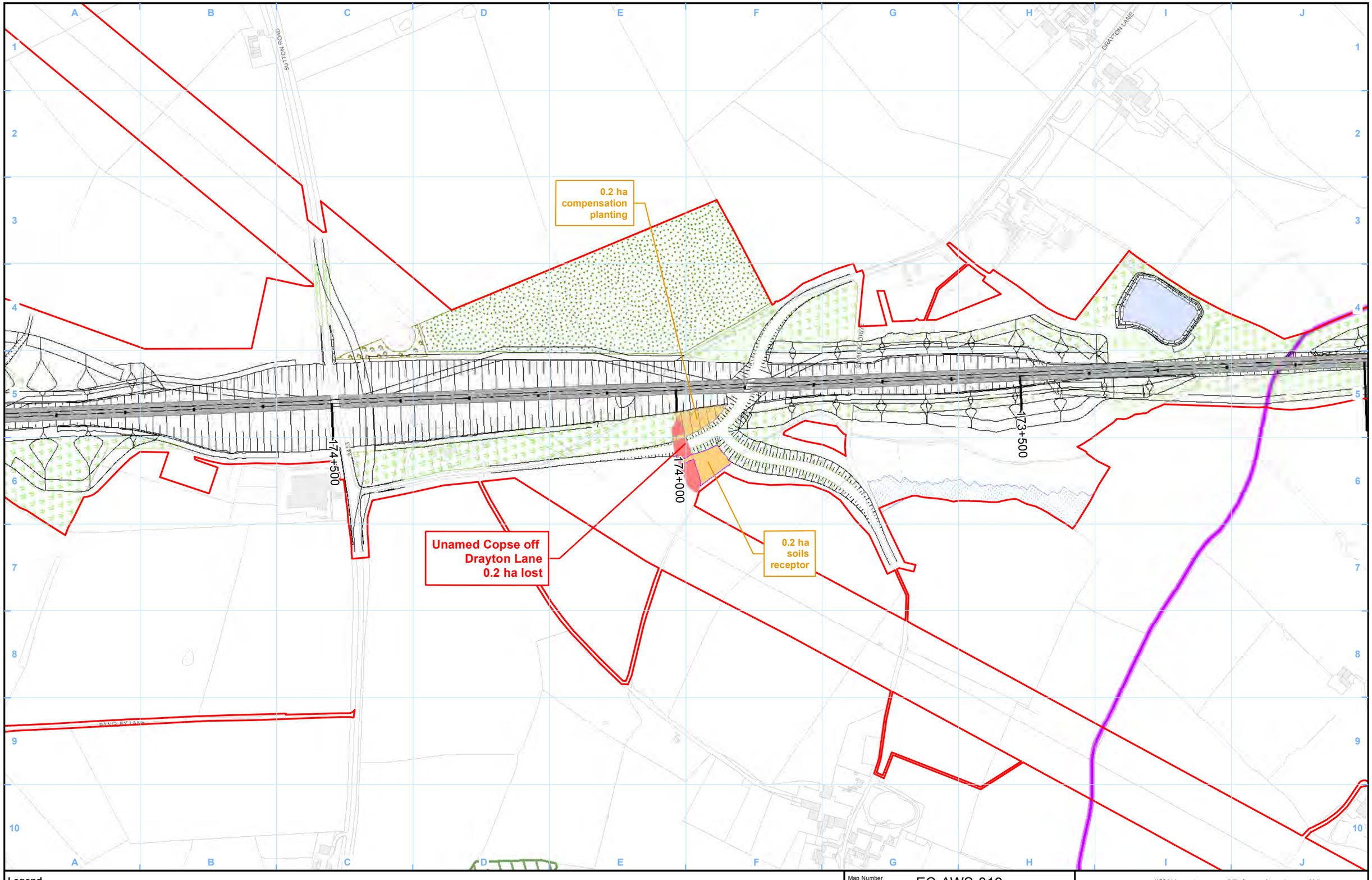

Legend

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- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-019

Map Name: Ancient Woodland Strategy: Unnamed Copse off Drayton Lane

Community Area: CFA21 Drayton Bassett, Hints & Weeford

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A total of 11ha of new planting (in addition to areas of soil translocation) to be provided as compensation for ancient woodland losses at Rookery and Roundhill Wood

Roundhill Wood
1.3 ha Lost

1.1 ha soils receptor for soils from Roundhill Wood

<0.1 ha retained

1.0 ha compensation planting

0.3 ha soils receptor

0.8 ha compensation planting for soils from the Rookery

0.4 ha soils receptor for soils from Rookery

Rookery
1.4 ha Lost

9.1 ha compensation planting

2.1 ha retained

1.0 ha soils receptor from the Rookery

177+500

176+000

ROCK HILL

SCHOOL LANE

HINTS COURT

Legend

- Rail alignment
- Tunnels external extent
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- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-020

Map Name: Ancient Woodland Strategy: Roundhill Wood and Rookery

Community Area: CFA21
Drayton Bassett, Hints & Weeford

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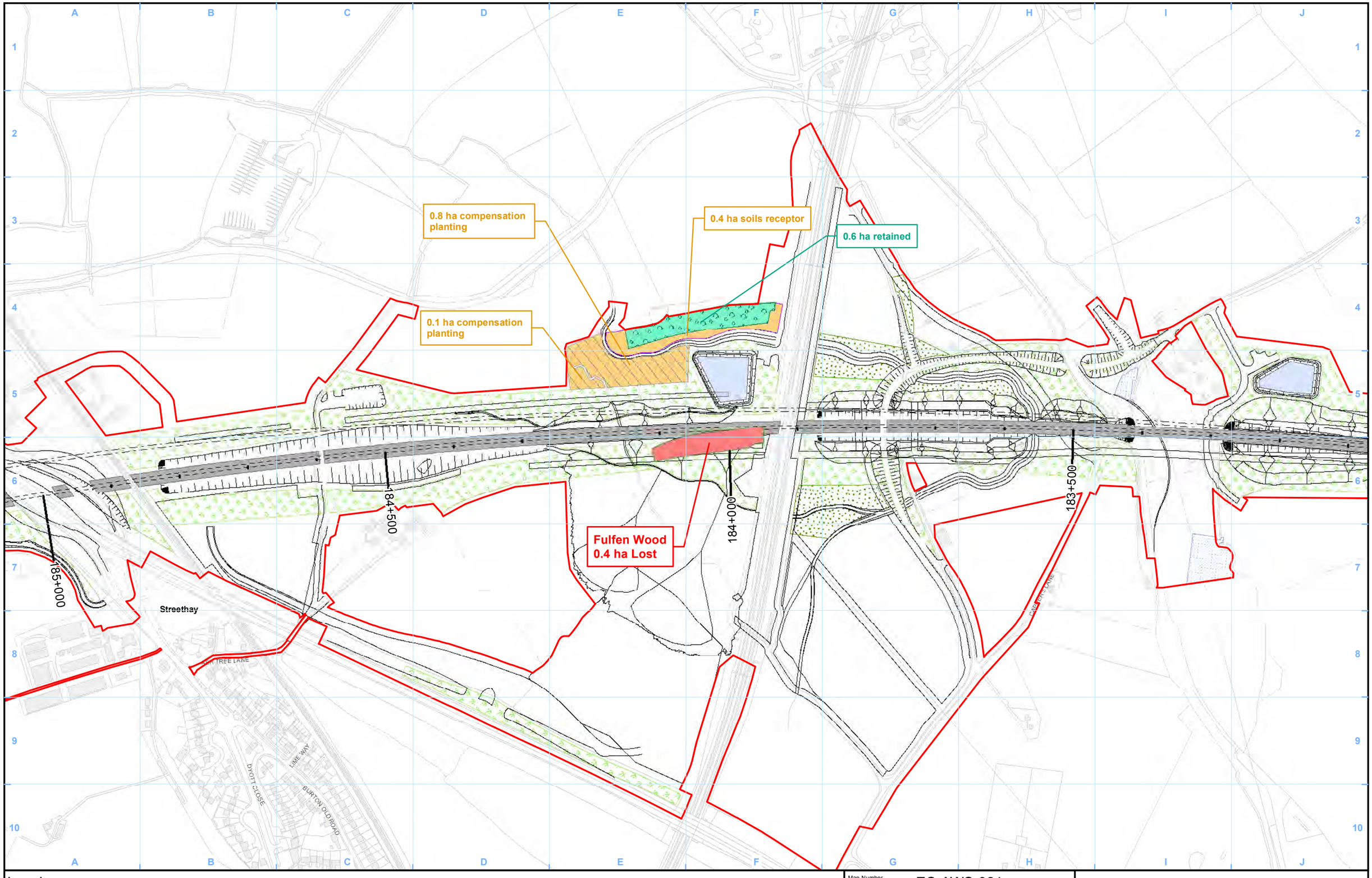

Legend

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- Rail alignment formation
- Tunnel portal
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- Area of receptor site for ancient woodland soils (ha)
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- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-021

Map Name: Ancient Woodland Strategy: Fulfen Wood

Community Area: CFA22 Whittington to Handsacre

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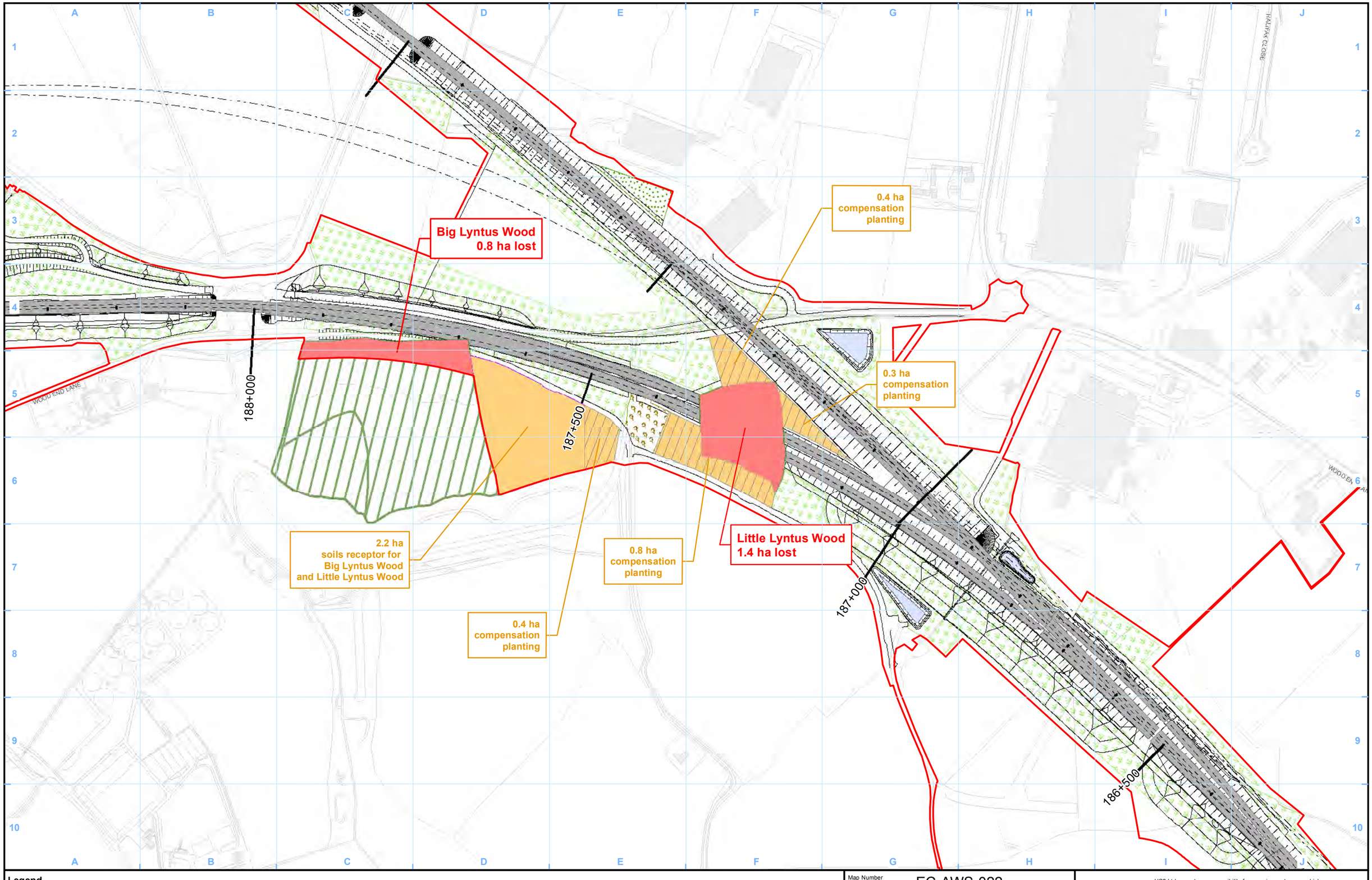

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-022

Map Name: Ancient Woodland Strategy: Big Lyntus Wood and Little Lyntus Wood

Community Area: CFA22 Whittington to Handsacre

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Doc Number:

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2.6 ha enhancement

0.2 ha enhancement

3.5 ha enhancement

5.7 ha enhancement

1.8 ha enhancement

1.7 ha soils receptor

2.0 ha compensation planting

5.5 ha enhancement

2.1 ha enhancement

1.3 ha enhancement

188+500

189+500

189+000

188+000

Ravenshaw Wood
1.7 ha lost

0.4 ha enhancement

0.7 ha compensation planting

WOOD END LANE

ND LANE

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
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- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Area of enhancement of existing ancient woodland (ha)
- Area where HS2 Ltd will undertake enhancement of non-ancient woodland (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-023

Map Name: Ancient Woodland Strategy: Ravenshaw Wood

Community Area: CFA22 Whittington to Handsacre

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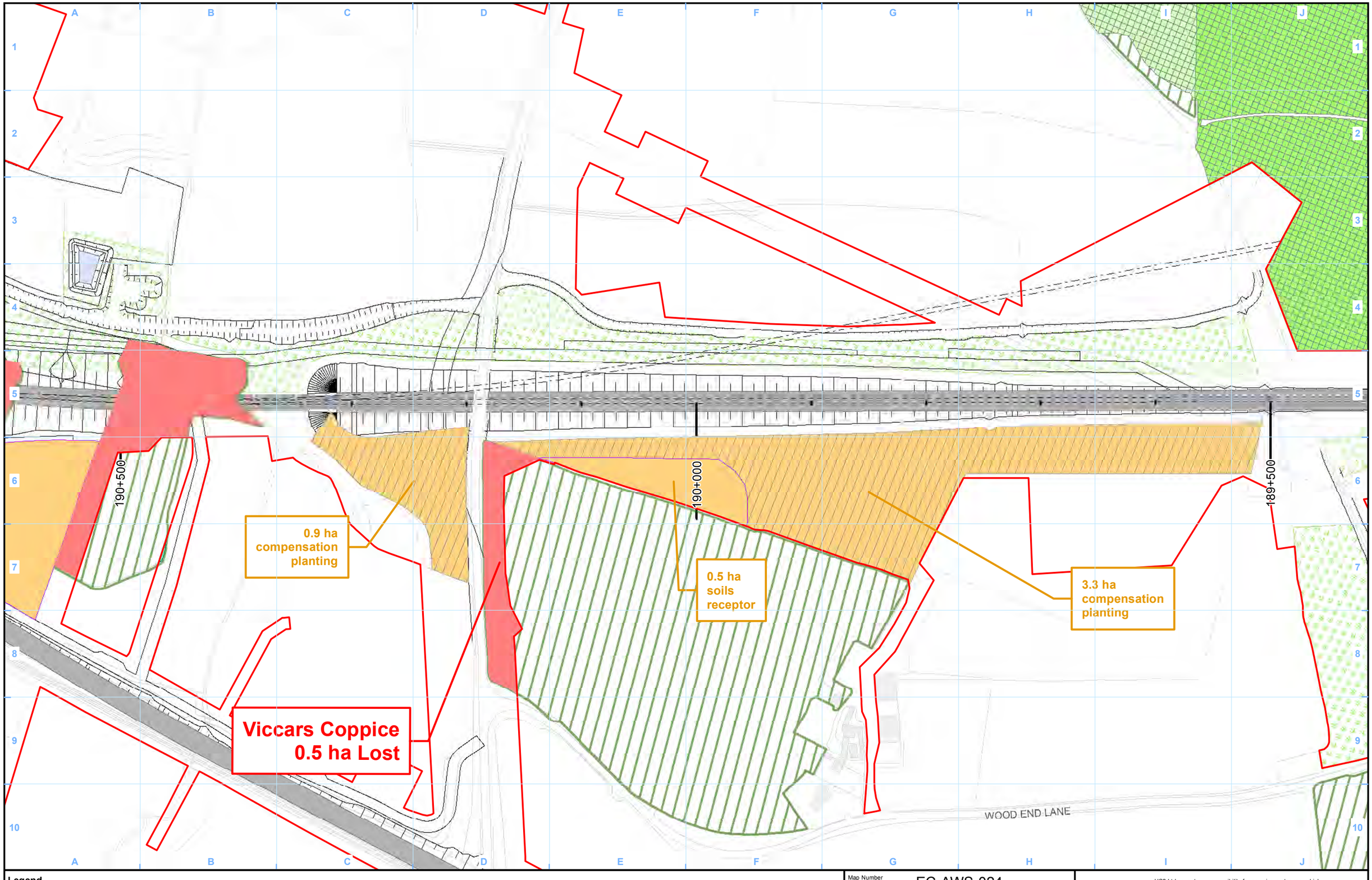

Legend

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- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Area of enhancement of existing ancient woodland (ha)
- Area where HS2 Ltd will undertake enhancement of non-ancient woodland (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-024

Map Name: Ancient Woodland Strategy: Viccar's Coppice

Community Area: CFA22 Whittington to Handsacre

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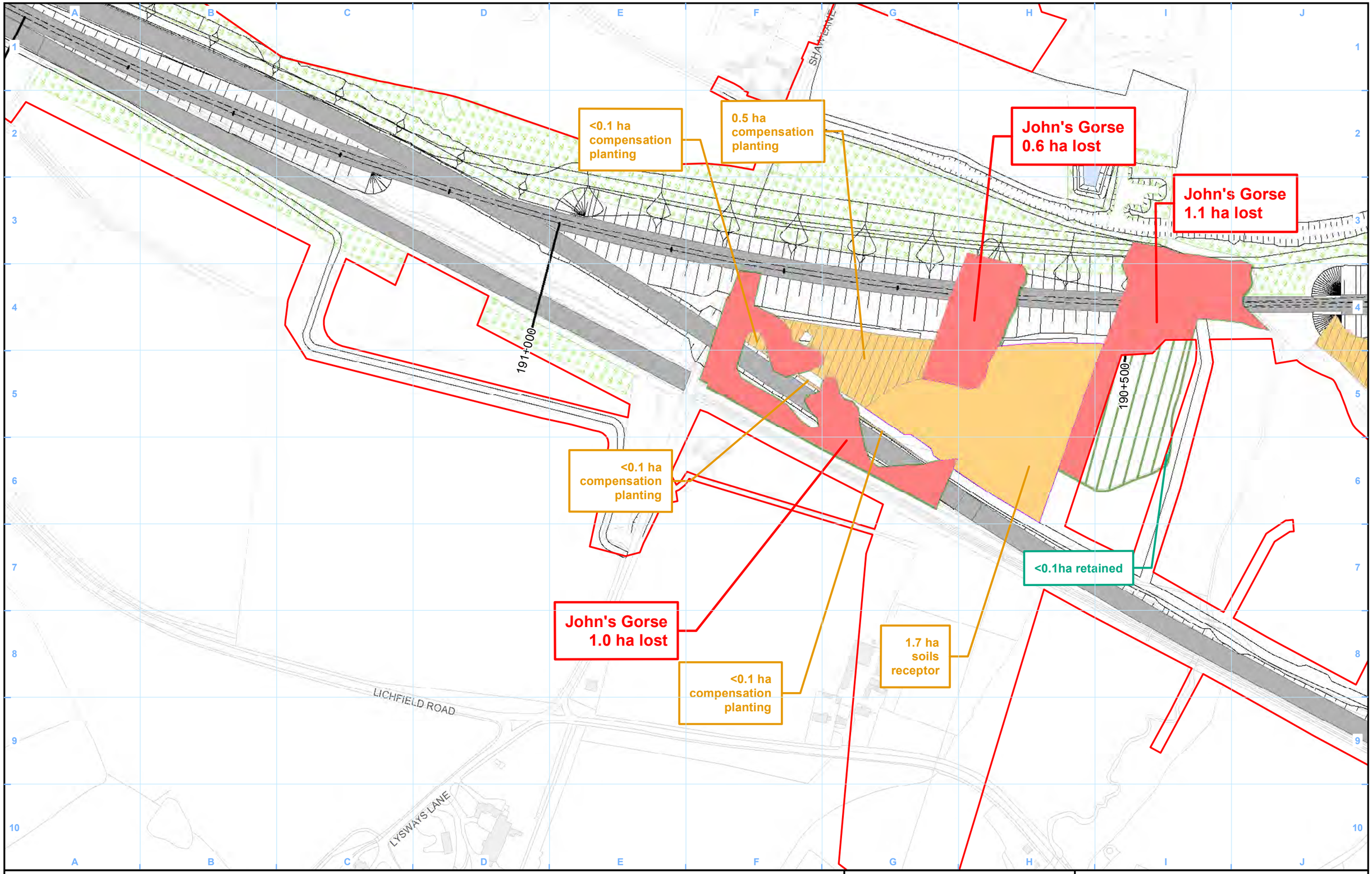
Doc Number:

Date: 23/03/17



Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-025

Map Name: Ancient Woodland Strategy: John's Gorse

Community Area: CFA22 Whittington to Handsacre

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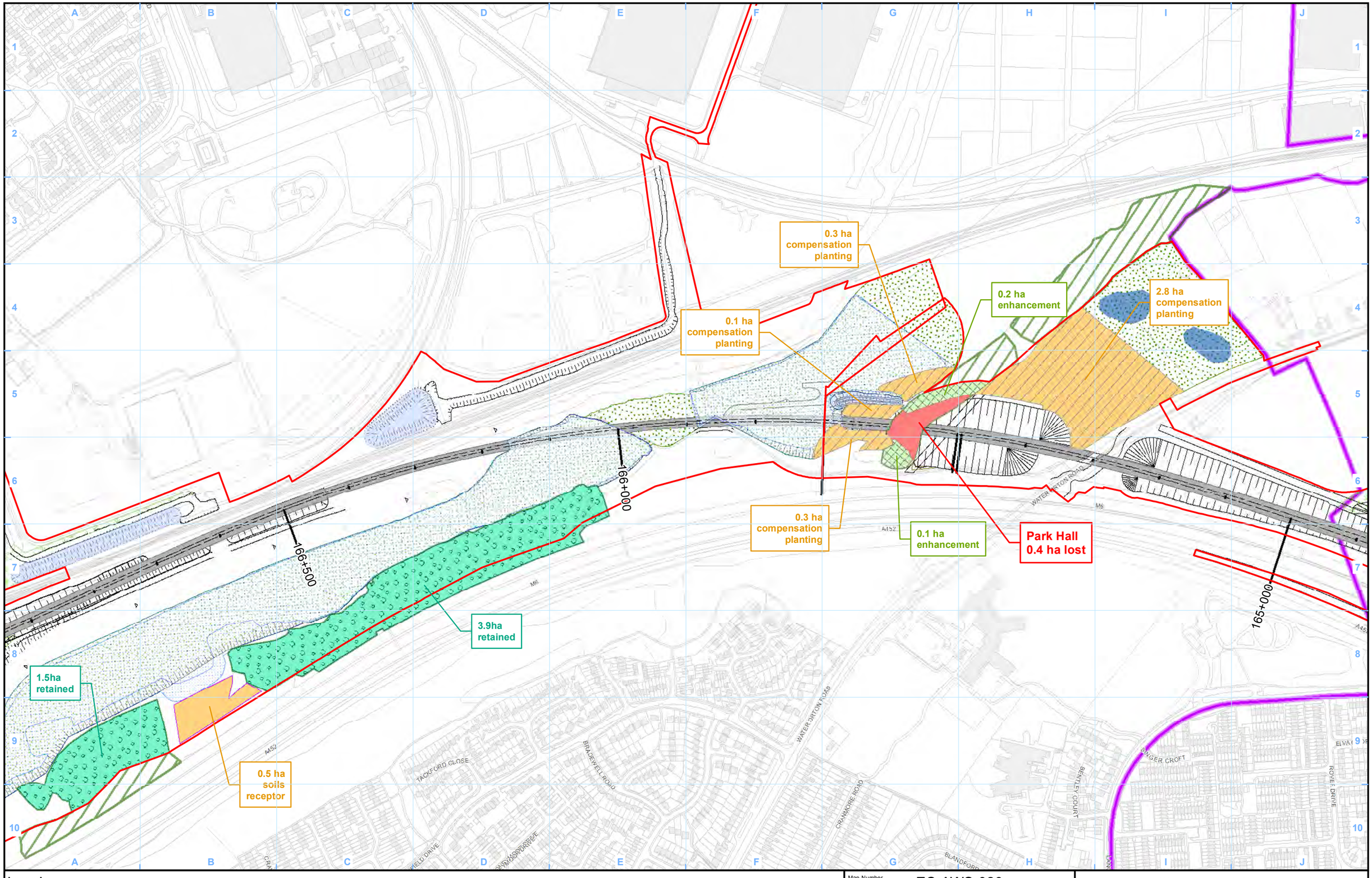

Legend

- Rail alignment
- Tunnels external extent
- Community forum boundary
- Land potentially required during construction
- Landscape earthworks
- Engineering earthworks
- Rail alignment formation
- Tunnel portal
- Areas of ancient woodland located outside of the Hybrid Bill limits that will be retained
- Area of direct loss of ancient woodland (ha)
- Area of ancient woodland located within the Hybrid Bill limits that will be retained and not utilised or otherwise directly impacted during either construction or operation (ha)
- Area of receptor site for ancient woodland soils (ha)
- Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)
- Area of enhancement of existing ancient woodland (ha)
- Replacement floodplain storage
- Balancing pond

Other scheme mitigation/compensation

- Ecological mitigation pond
- Woodland planting
- Grassland habitat creation
- Landscape mitigation planting (scrub/woodland)
- Grassed areas

Map Number: EC-AWS-026

Map Name: Ancient Woodland Strategy: Park Hall

Community Area: CFA25 Castle Bromwich & Bromford

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Doc Number:

Date: 23/03/17

Appendix 2: Ancient woodland assurances and commitments

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
197	HoC/1306	The Wildlife Trust for Birmingham and the Black Country	Assurance	01/10/2014	Park Hall Nature Reserve	Birmingham and the Black Country	Letter from Roger Hargreaves (HS2 Ltd) to Ms Georgia Stokes (The Wildlife Trust for Birmingham and the Black Country) - assurance 1 i)	The Secretary of State will require the nominated undertaker to engage with the Wildlife Trust for Birmingham and the Black Country, on a reasonably appropriate restoration plan and to improve so far as reasonably practicable public access to the site following construction of the Proposed Scheme. Restoration will include compensatory measures for the loss of ancient woodland on the site.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
198	HoC/1306	The Wildlife Trust for Birmingham and the Black Country	Assurance	01/10/2014	Park Hall Nature Reserve	Birmingham and the Black Country	Letter from Roger Hargreaves (HS2 Ltd) to Ms Georgia Stokes (The Wildlife Trust for Birmingham and the Black Country) - assurance 1 ii)	The Secretary of State will require the nominated undertaker to minimise so far as is reasonably practicable the impacts of realigning the power lines on the woodland.
257	HoC/0412	Staffordshire County Council	Assurance	09/10/2014	Lowering the vertical alignments at Hints	Roundhill Wood ancient woodland	Letter from Roger Hargreaves (HS2 Ltd) to Mr Clive Thomson (Staffordshire CC) Paragraph 4	The Promoter will require the nominated undertaker, so far as is reasonably practicable and in the light of the results of geotechnical site investigations to steepen the unstrengthened cutting slopes within the limit of the earthworks design life, so as to limit the impact of the scheme on Roundhill Wood ancient woodland.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
265	HoC/0409	Lichfield District Council	Assurance	09/10/2014	Lowering the vertical alignments at Hints	Roundhill Wood's ancient woodland	Letter from Roger Hargreaves (HS2 Ltd) to Ms Diane Tilley (Lichfield DC) Paragraph 4	The Promoter will require the nominated undertaker, so far as is reasonably practicable and in the light of the results of geotechnical site investigations, to steepen the unstrengthened cutting slopes within the limit of the earthworks design life, so as to limit the impact of the scheme on Roundhill Wood ancient woodland.
556	HoC/1641	Mrs Kathleen Wall	Assurance	26/01/2015	Woodland Mitigation	Plot number 32	Letter from Mr Roger Hargreaves (HS2 Ltd) to Mr James Collier (Howkins and Harrison LLP)	The Secretary of State will require the nominated undertaker to: reduce the extent of woodland mitigation in plot number 32 in the Parish of Ladbroke as illustrated in Sketch C223-CSI-CV-SKE-030-000192.
755	HoC/0520	Buckinghamshire County Council	Assurance	42173	Ancient Woodland Acquisition	Battlesford Wood and Ranston Covert, Buckinghamshire	Letter from Mr Roger Hargreaves (HS2 Ltd) to Ms Jackie Copcutt (HS2 Project Officer, Buckinghamshire CC) Paragraph 1 a)	The Secretary of State will require the nominated undertaker: to use reasonable endeavours to seek to reduce the physical impacts of HS2 Works on the Ancient Woodland located within Battlesford Wood and Ranston Covert as shown in the attached drawing no C222 -ATK - EV DPL-020 610007-PET000516 such that no such that no more than 0.1 hectare of the Ancient Woodland area is permanently or temporarily acquired or used for the Proposed Scheme.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
756	HoC/0520	Buckinghamshire County Council	Assurance	18/06/2015	Ancient Woodland - mitigation scheme	Battlesford Wood and Ranston Covert, Buckinghamshire	Letter from Mr Roger Hargreaves (HS2 Ltd) to Ms Jackie Copcutt (HS2 Project Officer, Buckinghamshire CC) Paragraph 1 b)	The Secretary of State will require the nominated undertaker: to implement the scheme of mitigation that is shown in relation to the area of Ancient Woodland at Battlesford Wood and Ranston Covert in the Environmental Statement and described on attached drawing no C252 -ETM-EV-MAP-020-003B95-P01 in the Colne Valley so far as reasonably practicable and in any event not to reduce the area, type and quality of the landscape planting provided.
757	HoC/0520	Buckinghamshire County Council	Assurance	18/06/2015	Ecology - electricity cables through tunnels	Pinnocks Wood, Buckinghamshire	Letter from Mr Roger Hargreaves (HS2 Ltd) to Ms Jackie Copcutt (HS2 Project Officer, Buckinghamshire CC) Paragraph 2 a)	The Secretary of State will require the nominated undertaker: subject to the provisions of Schedule 32 to the Bill, to carry out the HS2 Works at Pinnocks Wood by using a method of construction involving the placing of electricity cables through tunnels underground.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
758	HoC/0520	Buckinghamshire County Council	Assurance	18/06/2015	Ecology - cable tunnelling	Pinnocks Wood, Buckinghamshire	Letter from Mr Roger Hargreaves (HS2 Ltd) to Ms Jackie Copcutt (HS2 Project Officer, Buckinghamshire CC) Paragraph 2 b)	The Secretary of State will require the nominated undertaker: to undertake the proposed cable tunnelling under the area of Ancient Woodland at Pinnocks Wood in accordance with the provisions relating to landscape management and specifically tree protection that are set out in the Code of Construction Practice and described in the Environmental Statement.
948	HoC/1127	Weston Hall Farm - Mr McGregor	Assurance	20/01/2015	Woodland habitat creation and replacement	Weston Hall Farm, Weston under Wetherley Leamington Spa Warwickshire CV33 9BZ	Email from Roger Hargreaves (HS2 Ltd) to Mr Andrew Robert McGregor, paragraphs a) 1 and a) 2 and b)	(a) Subject to the satisfaction of the conditions set out in paragraph (b) below and the design development of the Proposed Scheme the Secretary of State will require the nominated undertaker to: 1) reduce the area of land proposed to be acquired for the purposes of creating woodland habitat within plot number 5 in the Parish of Weston Under Wetherley as shown on Sketch 1127A attached; and 2) in consequence of 1), provide alternative replacement woodland habitat as shown on Sketch 1127A attached. (b) The conditions referred to in paragraph (a) above which must be satisfied prior to the commencement of the development

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
								proposed in paragraphs (a)(1) to (3) above ('the Development') and in respect of which the Secretary of State will use reasonable endeavours to satisfy are: 1) the successful promotion of an amendment to the Bill through the introduction of an Additional Provision which confers on the Secretary of State any powers necessary to construct the Development and to acquire compulsorily any land required for the Development; 2) the inclusion in a supplemental Environmental Statement, of an assessment of the significant environmental effects of the Development; 3) the Development having the benefit of deemed planning permission under the Bill.
976	HoC/0520	Buckinghamshire County Council	Assurance	05/10/2015	Ecology - scientific research on impact on Ancient Woodland and Bechsteins Bats	Buckinghamshire	Letter from Roger Hargreaves (HS2 Ltd) to Jackie Copcutt (Buckinghamshire CC)	The Secretary of State will require the Nominated Undertaker to put in place an appropriate monitoring regime for these sites, based on the outline monitoring proposals set out in HS2 Information Paper E26, Indicative Periods for the Management and Monitoring of Habitats created for HS2 Phase One. The monitoring programme will be designed to provide appropriate research outputs, and the draft monitoring programme will be shared with the Council prior to finalisation.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
1542	AP2/0116	Roger Brown and Jacqueline Owen	Assurance	15/01/2016	Woodland planting proposals agreement	Tibbets Farm,	Letter from Roger Hargreaves (HS2 Ltd) to Simon Harris (Land Agent)	The Secretary of State will require the nominated undertaker to agree a jointly acceptable layout for the Additional Provision 2 (AP2) woodland planting proposals on Tibbetts Farm (the holding), with the owners of the holding. The new layout will remain within the holding and will be required to achieve the mitigation it was designed for in AP2, and will be subject to: a) the granting of any necessary consents, and; b) the granting of any necessary access rights by the land owner for construction and future maintenance of the mitigation works.
1592	AP4/0241	London Wildlife Trust	Assurance	21/01/2016	Woodland survey	Pinnocks Wood, Uxbridge Golf Course	Letter from Roger Hargreaves (HS2 Ltd) to Mr Mathew Frith (London Wildlife Trust), paragraphs 1 and 1(a)	1. The Secretary of State for Transport will require the nominated undertaker to do an ecological survey of Pinnocks Wood to inform the option selection of any realignment of the Uxbridge Golf Course haul road required under paragraph 3 below. (a) This is subject to the landowner of Pinnocks Wood granting the necessary rights to the nominated undertaker by no later than

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
								April 2016 to enable the nominated undertaker to design, carry out and report the results of the ecological survey in paragraph a to a standard that can reasonably be used to inform the option selection for Uxbridge golf course haul road realignment. In this assurance: 'the Uxbridge golf course haul road' means the proposed haul road between the A40/Swakeleys Road roundabout and Harvil Road that will be constructed on plots AP4:012, AP4:013, AP4:014, AP4:015, AP4:016, AP4:017, AP4:018, AP4:019 and AP4:021 on the deposited plans for the Bill in the London Borough of Hillingdon.
1653	HoC/0234	David Wright, Glebe Farm, Waddesdon	Assurance	25/01/2016	Relocation of woodland habitat creation	Glebe Farm, Quainton Road, Waddesdon, Buckinghamshire, HP18 0LS	Letter from Roger Hargreaves (HS2 Ltd) to David Wright	The Secretary of State will require the nominated undertaker to relocate the proposed woodland habitat creation identified by the red dashed line on Drawing No. C222-ATK-EVDPL-020-661120-PET000234. Woodland habitat creation will now be located in the area of land identified by the green boundary on the same drawing.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
1967	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Survey of ancient woodlands	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 1a in assurance letter	Prior to commencement of construction, the Promoter will [or will require the nominated undertaker to]: survey the ancient woodlands identified within Bill limits and publish the results as soon as is reasonably practicable
1969	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Works adjacent to or within 100 meters of ancient woodland	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 2 in assurance letter	Where any works authorised by the Bill are to be undertaken adjacent to or within 100 metres of an area of ancient woodland, the Promoter will require the nominated undertaker, within a reasonable time, prior to commencement of construction, to engage with the Petitioner in respect of such works and will have regard to any reasonable representations made by the Petitioner regarding any proposed mitigation (such measures to be on land within Bill limits).
1970	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Natural England's Standing Advice	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 3 in assurance letter	The Promoter will require the nominated undertaker to have regard to the guidance in Natural England's Standing Advice on avoiding damage to or loss of ancient woodland or ancient and veteran trees and for compensation for any unavoidable loss.
1971	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Enhancements of existing	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-	Provided it does not increase project costs and subject to obtaining any necessary consents and permissions, the nominated

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
					Ancient Woodland		Prices (Woodland Trust) - point 4 in assurance letter	undertaker will consider any reasonable and timely opportunities that arise to undertake enhancements of existing ancient woodlands outside Bill limits as an alternative to providing compensation as authorised by the Bill and consider new opportunities, where reasonably practicable, to maximise biodiversity gain.
1972	HoC/1508	The Woodland Trust	Assurance	091/02/2016	Planting stock	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 5 in assurance letter	The Promoter will require the nominated undertaker to seek to use planting stock for ancient woodland compensation measures that is sourced and grown within the UK.
1973	HoC/1508	The Woodland Trust	Assurance	42401	Monitoring of progress in site management plans	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 6 in assurance letter	The Promoter will require the nominated undertaker to establish appropriate objectives in site management plans for each area of ancient woodland habitat compensation against which to monitor progress.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
1974	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Ecological objectives of ancient woodland compensation	Routewide	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 7 in assurance letter	The Promoter will ensure that a management regime is in place to ensure, as far as reasonably practicable, that the ecological objectives of ancient woodland compensation set out in the site management plan are achieved within an appropriate timescale. The appropriate period of monitoring and management of new habitats is set out in Information Paper E26 (Indicative Periods for the Management and Monitoring of Habitats Created for HS2 Phase One) ("IP E26"). The Environmental Memorandum will be revised to reflect the information in IP E26.
1976	HoC/1508	The Woodland Trust	Assurance	01/02/2016	Construction at Newyears Green Covert	Newyears Green Covert near Ickenham	Email from Shilpa Amin (HS2 Ltd) to Victoria Bankes-Prices (Woodland Trust) - point 9 in assurance letter	The Promoter will ensure that there are no construction works within that part of Newyears Green Covert as shown edged red on plan 1 attached and which is on the Ancient Woodland Inventory as at the date of this assurance.
2075	n/a	General	Assurance	10/03/2016	Reduction in land take and connectivity of woodland	Claydon Estate	Promoter's Response to the House of Commons High Speed Rail (London-West Midlands) Bill Select Committee's 'Second special report' of session	In designing the southern sidings, the Promoter will seek to introduce further connectivity of woodland and where reasonably practicable, reduction in land acquisition.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
							2015-16 - paragraph 22	
2253	HoL/0008	Edward McMahon	Assurance	19/05/2016	Woodland planting	The area shown hatched in orange on Bill Plan 3-53 ("the plan") annexed (Annex B) to this assurance	Letter from Roger Hargreaves (HS2) to Mr McMahon, paragraph a)	In order to provide visual screening of the Hs2 railway cutting and the setting of Horsley Brook Farm, the Secretary of State will require the nominated undertaker within the lands shown in the parish of Swinfen and Packinton and numbered 16 on the deposited plans for the Bill ("plot 16"): a) not to plant woodland within the area shown hatched in orange on Bill Plan 3-53 ("the plan") annexed (Annex B) to this assurance.
2498	n/a	General	Assurance	09/11/2016	Woodland	Routewide	Department for Transport policy paper, assurance 1	HS2 Ltd will: - seek to maximise woodland planting on land bought in relation to HS2 – initial estimates suggest that this will be up to 50 hectares - establish a £5 million fund to support third party woodland planting projects to provide woodland enhancement beyond what is required under standing advice from Natural England and the Forestry Commission

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
2547	HoL/0223, HoL/0221	Royal Society of Wildlife Trusts and Berkshire, Buckinghamshire & Oxfordshire Wildlife Trust	Assurance	18/11/2016	Ancient Woodland	Routewide	Letter from Roger Hargreaves (HS2 Ltd) to Matthew Jackson (Royal Society of Wildlife Trusts), assurance 3	For the avoidance of doubt, ancient woodlands (and the compensation measures proposed for them) shall be removed from the no net loss calculation and reported on separately.
2551	HoL/0374	The Woodland Trust	Assurance	18/11/2016	Ancient Woodland - mitigation scheme	Area within the red line boundary on drawing WT1 (Appendix 1)	Letter from Roger Hargreaves (HS2 Ltd) to Victoria Bankes-Price (The Woodland Trust), assurance 1	In this assurance: "John's Gorse" means the area within the red line boundary on drawing WT1 (Appendix 1); The Secretary of State will require the Nominated Undertaker to: (i) seek to reduce, so far as reasonably practicable, the extent of ancient woodland removed for the purposes of the temporary construction works at John's Gorse; and (ii) when constructing any access or footpath diversion, or upgrading any existing route through Broadwell's Wood for those purposes, not to remove any ancient woodland.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
2552	HoL/0374	The Woodland Trust	Assurance	18/11/2016	Soil translocation methodology	Routewide	Letter from Roger Hargreaves (HS2 Ltd) to Victoria Bankes-Price (The Woodland Trust), assurance 2	The Secretary of State will require the Nominated Undertaker to: (i) provide a clear plan and methodology for each area of Ancient Woodland soil to be translocated as a result of the Proposed Scheme within the relevant Ecology Site Management Plan for that local area; and (ii) to engage with the Woodland Trust in the development of those arrangements.
2553	HoL/0374	The Woodland Trust	Assurance	18/11/2016	Consultation on works close to Ancient Woodland	Routewide	Letter from Roger Hargreaves (HS2 Ltd) to Victoria Bankes-Price (The Woodland Trust), assurance 3	The Secretary of State will require the Nominated Undertaker to consult with the Woodland Trust in respect of any construction activities undertaken within, or within 100m of, an area of Ancient Woodland which have been assessed as likely to have an adverse effect on the woodland, as reported in the Environmental Statement deposited with the Bill.

U&A ref id	Petition no (where relevant)	To Whom	Type	Date issued	Subject	Geographical location	Reference	Text (where relevant)
2554	HoL/0374	The Woodland Trust	Assurance	4269218/11/2016	Location of tree planting	Routewide	Letter from Roger Hargreaves (HS2 Ltd) to Victoria Bankes-Price (The Woodland Trust), assurance 4	The Secretary of State will require the Nominated Undertaker to: (i) grow all trees for the Proposed Scheme in the United Kingdom; (ii)when sourcing tree seed stock for the purposes of the Proposed Scheme, to use reasonable endeavours to source such seed stock from the United Kingdom whilst recognising that, in line with the Secretary of State's commitment to planning for future resilience to climate change, some seed stock is to have an origin and provenance from 0° - 5° latitude south of the planting location; (iii) to put in place a system of plant passports for all seed and plant material to reduce risks to biosecurity.
2781	n/a	General	Assurance	23/02/2017	Ancient Woodland	Routewide	Information Paper E2-Ecological Impact (v1.5), paragraph 4.3	To compensate for the loss of ancient woodland the nominated undertaker will use best practice measures such as re-using the ancient woodland soils and creating new mixed deciduous woodland.

Appendix 3: Ecology Technical Standard (extract of content relating to ancient woodland from version P10)

2 Woodland creation and soil translocation

2.1 Approaches

2.1.1 The design of the Scheme includes provision for areas of woodland habitat creation through a combination of new planting and the salvage and translocation of soils from affected ancient woodlands. The following approaches are required:

- Salvage of ancient woodland soils (and associated seed bank), vegetation and dead wood in response to losses of ancient woodland habitat;
- Creation of woodland to compensate for loss of woodland habitat; and
- Creation of woodland to address impacts on specific species (for example bats), to provide and improve habitat connectivity, and to better integrate the Scheme into the surrounding landscape.

2.2 Design specifications - general

2.2.1 Woodland creation though planting - primarily for the purpose of nature conservation: the planting design and species selection shall be informed by the ecological and physical characteristics of the woodland that is being lost. The design shall identify 10, 25 and 50 year targets for the following:

- Species composition % (canopy/understorey/ground flora);
- Canopy cover/glades % (including need for sowing/seeding);
- Height (m) (canopy/understorey);
- Age structure (at 50 years only);
- Woodland edge structure (including rides and glades).

2.2.2 Translocation of ancient woodland soils and vegetation: As a starting assumption the soils are to be translocated from each of the areas of ancient woodland, where loss will occur, to provisional locations identified in HS2's Ancient Woodland Strategy document (C250-ARP-EV-REP-000-003946).

2.2.3 Design specification for translocation of ancient woodland soils and vegetation shall:

- follow CIRIA C600[2] and recognised best practice based on experience at Cossington Fields (A2/M2)[3];
- be based upon baseline surveys;
- be informed by a detailed soil survey.

[2] Penny Anderson, 2003, CIRIA C600, Habitat translocation – a best practice guide. CIRIA. London.
[3] Cresswell/Hyder 2012 A2/M2 Cobham to Junction 4 Widening Scheme: Ten-year Ecological Monitoring Strategy 2000-2009. Final Monitoring Report

2.2.4 Figure 2.1 sets out the decision-making process for re-use of ancient woodland soils.

2.3 Information required for detailed design

2.3.1 This section identifies the details that will be required to inform the development of the detailed design, including the decision on whether to translocate soils.

2.3.2 A National Vegetation Classification (NVC) survey and mapping of the woodland to be lost shall be undertaken, to sub-community level, according to published methods[4].

2.3.3 All mapping should be in accordance with the Geographic Information System Standards (HS2-HS2-GI-STD-000-000002).

Information to inform new woodland creation

2.3.4 The following information shall be required to inform new woodland creation:

- Species composition and soil and physical characteristics of the woodland to be lost, to comprise soil texture, total depth, horizon thickness, rooting depth, structure, available nutrient levels (N, P, K, Mg) and other variables that may subsequently be identified by HS2 Ltd as necessary;
- The characteristics of the soil to be planted into (as above) and the Natural England Character Area to inform the planting plan;
- Habitat creation site characteristics (drainage, soils, slope, aspect and microtopography) and their appropriateness for the desired habitat;
- Availability of dead wood habitat, coppice stools, saplings suitable for salvage from the habitat being impacted for re-use at the woodland creation site;
- Restrictions to undertaking the works (including access restrictions, presence of utilities or services, presence of protected or invasive species);
- Landscape design requirements;
- Post-planting management; and
- The presence of protected species and associated constraints.

Information to inform soil translocation

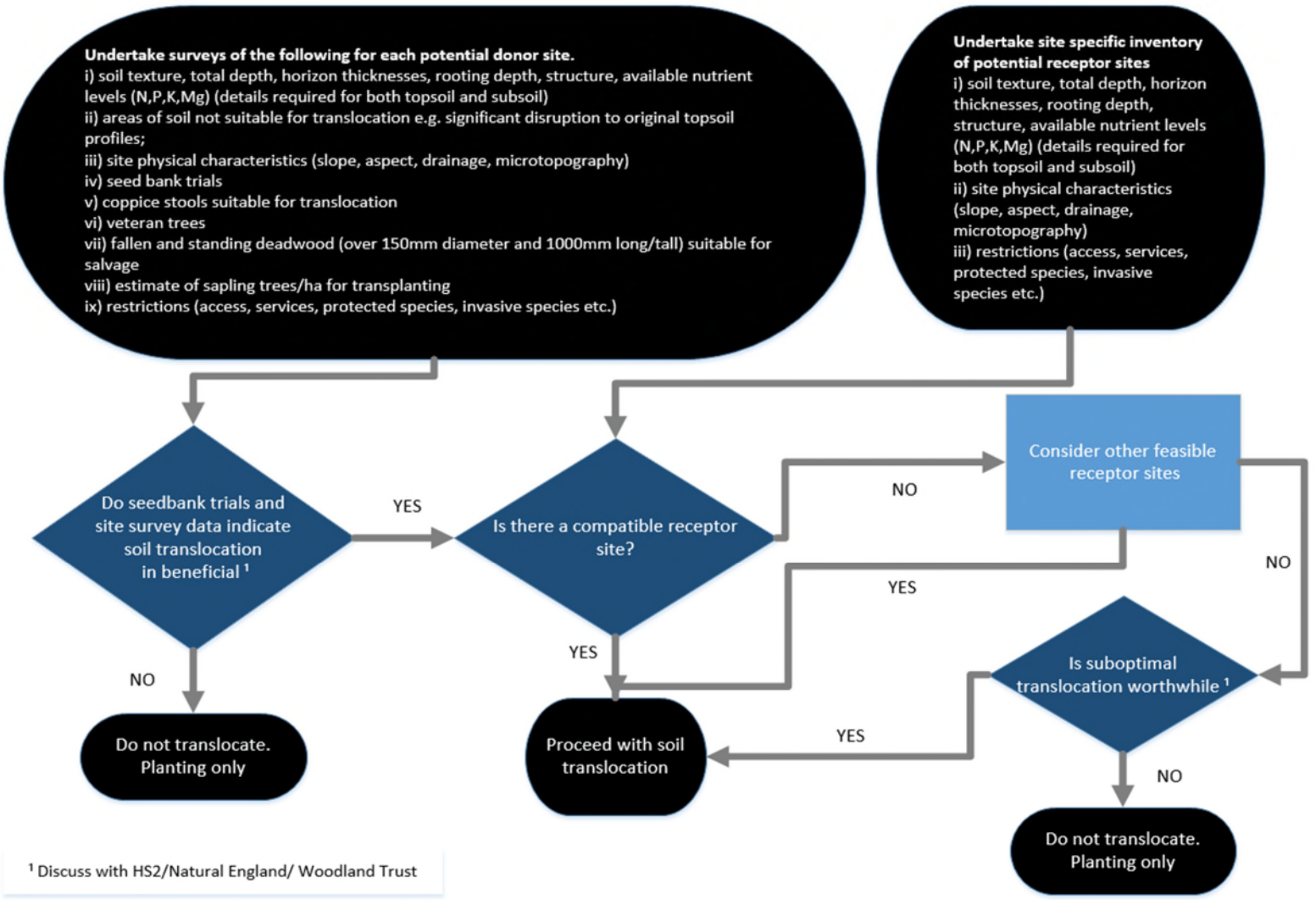
2.3.5 The following information shall be required to inform soil translocation:

- Donor and receptor site characteristics, (physical and chemical characteristics as identified above), to ensure comparability.
- Data collected on number of coppice stools, veteran trees and standing and fallen dead wood present and suitable for transfer.

[4] Rodwell, J. S. (ed.) (1991) British Plant Communities. Volume 1. . Woodlands and Scrub Cambridge University Press

- Assessment of the potential for natural regeneration through seed bank trials using an approved method.
- Presence and abundance of species of woodland plant with bulbs and rhizomes to inform soil depths to be moved;
- Restrictions to undertaking the works;
- Presence of protected species and associated constraints;
- Uses for surplus topsoil (generated from receptor sites); and
- Post-translocation management or post-construction monitoring requirements.

Figure 2.1 W1 Decision Matrix: compensation for ancient woodland loss and soil translocation



2.4 Design specification - woodland planting

2.4.1 The habitat types to be created from the list in Section 41 of the NERC Act will be specified. They will normally also specify the particular target plant communities that are required.

2.4.2 Each woodland area should include for 10% to 20% open areas (at maturity) not planted with trees (as rides and glades). Design may vary from this where particular mitigation objectives (landscape, visual or ecological) at each location require variance.

2.4.3 The detailed planting plan for each site requiring woodland planting shall be determined by reference to the presence and abundance of key species in the woodlands being lost and/or the soil types being planted into and/or the relevant Natural England Character Area.

Site preparation

2.4.4 Any necessary cultivation/vegetation management and/or clearance to be undertaken prior to woodland planting shall be determined on a site by site basis and shall be informed by a soil survey and assessment of the ground vegetation and agreed with the Ecological Clerk of Works (ECoW) and soil scientist.

Planting

2.4.5 Woodland planting shall occur in the period dormant season.

Establishment phase management

2.4.6 The requirements for management of new planted woodlands for the establishment period to 50 years are detailed in the Technical Standard – Landscape Maintenance, Management and Monitoring Plan (HS2-HS2-EV-STD-000-000023).

Target performance

2.4.7 The overall target for woodland planting is the establishment of planted woodland that shall conform with the Lowland Mixed Deciduous Woodland or Lowland Beech and Yew Woodland priority habitat types listed on Section 41 of the NERC Act 2006.

2.4.8 Detailed targets shall be determined by the species composition used, the nature of woodlands lost, the soil type into which new woodland is to be planted and the Natural England Character Area. Interim targets shall also be defined, based around the timing of management operations.

Performance requirements

2.4.9 Performance requirements for woodland planting shall include:

- Development of open areas and edge habitat as appropriate to woodland size

and mitigation objectives; and

- Development in the longer term of a varied age structure of trees and species composition and that preserve any existing transitions with other surrounding semi-natural habitats.

2.5 Design specification – translocation of soils and vegetation

2.5.1 Translocation should be undertaken in late autumn/early winter avoiding frost/snow and heavy rain. Suitable weather conditions are described below.

2.5.2 Low ground pressure vehicles should be used for these works.

Receptor site preparation

2.5.3 Vegetation shall be cleared and arisings removed from the woodland soil and vegetation receptor site, accounting for restrictions associated with other ecological objectives and mitigation (including nesting birds and other protected species).

2.5.4 The topsoil shall be stripped and removed (to the depth defined by soil surveys), using a non-toothed bucket.

2.5.5 Sequential stripping should be undertaken as material from the donor site becomes available, to limit the extent of bare ground present (and thus limit the risk of erosion and silt-laden runoff).

2.5.6 The topographical and micro-topographical features of the woodland soil and vegetation donor site (including the slopes, depressions and raised areas), shall be recreated in the exposed subsoil surface prior to placement of translocated soils and shall be overseen by the ECoW.

2.5.7 Haul and access routes shall not run on topsoil, but may run on exposed subsoil.

2.5.8 Prior to spreading the translocated soils, the subsoil shall be ripped to a depth of 450mm with tines set at 600mm centres (subject to site objectives). The surface shall then be cultivated to a depth of 150mm in strips immediately prior to the spreading of translocated topsoil. No vehicles shall traffic over the prepared surface.

Donor site preparation and soil/vegetation translocation

2.5.9 Vegetation clearance should be undertaken within one month prior to soil translocation.

2.5.10 Areas where the woodland soils are not suitable for translocation shall be identified and agreed with a suitably qualified and experienced soil scientist, with clear reasons detailed. These areas shall be clearly demarcated.

2.5.11 For any plantation ancient woodland sites (PAWS) planted with conifers that are subject to soil translocation, needle litter should be removed prior to topsoil stripping.

2.5.12	Prior to vegetation clearance, coppice stools, saplings and dead wood (where present) for translocation shall be identified and clearly marked.
2.5.13	Dead wood (standing or fallen and over 150mm diameter and 1000mm long/tall), shall be removed and placed within the receptor area under direction / agreement of the ECoW.
2.5.14	Where felled trees are to be used to provide new dead wood habitat, mature trees can be used to provide standing dead wood by removing all branches and "planting" the main trunk at the receptor site to a depth so that the tree is stable once installed.
2.5.15	Any veteran tree hulks that are to be moved as standing dead wood, or are to be placed in the receptor area as fallen dead wood.
2.5.16	Any saplings that are identified for translocation shall be excavated by hand tools prior to woodland soil translocation.
2.5.17	Unless otherwise directed by the ECoW, they should be taken directly to the receptor site and re-planted into reinstated soils. If they need to be held for any period of time, this should be in a nursery environment. Proposals for nursery arrangements should be included within the detailed design for approval by HS2 Ltd.
2.5.18	Prior to all woodland soil handling operations, a soil scientist approval shall be required to ensure the soils are in an appropriate condition to be handled without risk of damage.
2.5.19	Soil-handling operations shall cease during periods of rain, whereby there is potential for damage to the soils.
2.5.20	Topsoil (to a depth defined through soil surveys but can be between 100mm and 300mm) shall be stripped using a non-toothed excavator bucket to avoid mixing of topsoil and subsoil. The soil survey undertaken shall inform whether the topsoil shall be stripped as a single layer or as two layers. This topsoil shall be taken directly to the receptor site. There shall be no storage of topsoil beyond the day of stripping (i.e. stripping, transport and restoration operations shall occur within one day).
2.5.21	Haul and access routes shall not run on topsoil, but may run on exposed subsoil.
2.5.22	Haul routes shall be mulched and maintained in a serviceable condition for the traffic movements required.
2.5.23	All machines shall work from the haul route or exposed subsoil. There shall be no tracking over topsoil.
2.5.24	Where there is also a requirement for subsoil to the translocated, this shall be stripped and transported separately from the topsoil.
2.5.25	Where coppice stools are to be translocated, they shall be lifted with as large a root ball as possible; using an appropriate bucket excavator or tree spade capable of a root ball up to three metres diameter.

2.5.26 Stools should be lifted sequentially, moved to the receptor site and re-planted the same day. If this is not possible coppice stools can be stored during the dormant season for up to 3 days (as long as appropriately protected from drying).

2.5.27 Once all salvageable material has been removed, the woodland soil and vegetation donor site shall be inspected and a completion certificate signed by the ECoW before the commencement of any other construction works.

Receptor site - reinstatement of soils and vegetation and planting

2.5.28 The following shall be completed prior to reinstatement of topsoil at the woodland soil and vegetation receptor site:

- Placement of subsoil (where relevant); and
- 'Planting' of coppice stools (backfilled with subsoil) and hulks for dead wood.

2.5.29 The woodland soil and vegetation donor site topsoil shall be loose tipped onto the prepared surface and shall be spread using a non-toothed bucket. The topsoil shall be spread to a depth as defined by the soil survey, with any additional depth included to allow for settlement of the soil (based on volume calculations). Marker posts, at an appropriate spacing, shall be used to indicate the range of depths for the topsoil to be spread to.

2.5.30 Planting shall be undertaken in the next available planting period following translocation. An exception to this is where seed bank trials show greater than 75% weed flora present, in which case weed treatment shall be required and trees planted following treatment.

Establishment phase management

2.5.31 For areas receiving ancient woodland soils, management shall be undertaken in accordance within the ancient woodland section of the Technical Standard – Landscape Maintenance, Management and Monitoring Plan, unless there is a requirement for specific management practice in connection with the presence of a protected species.

Target performance

2.5.32 Targets should be identified based upon the donor community and in accordance with the target performance identified for woodland planting.

Performance requirements

2.5.33 Soil translocation should be undertaken by specialist contractor.

Appendix 4: HS2 Planting Procurement Strategy (extract of content relating to ancient woodland from version P03)

Community Forum Area	Type	Species	% of mix*
17	Local tree species	*Sorbus aucuparia* (rowan)	varies
18	Local tree species	*Fagus sylvatica* (beech)	varies
19	Local tree species	*Fagus sylvatica* (beech)	varies
20	Local tree species	*Castanea sativa* (sweet chestnut)	varies
21	Local tree species	*Pinus sylvestris* (Scots pine)	varies
22	Local tree species	*Sorbus aucuparia* (rowan)	varies

* Plant distribution figures are indicative only and in reality there will be considerable variation in species distribution locally.

Table 2: Woodland planting mixes

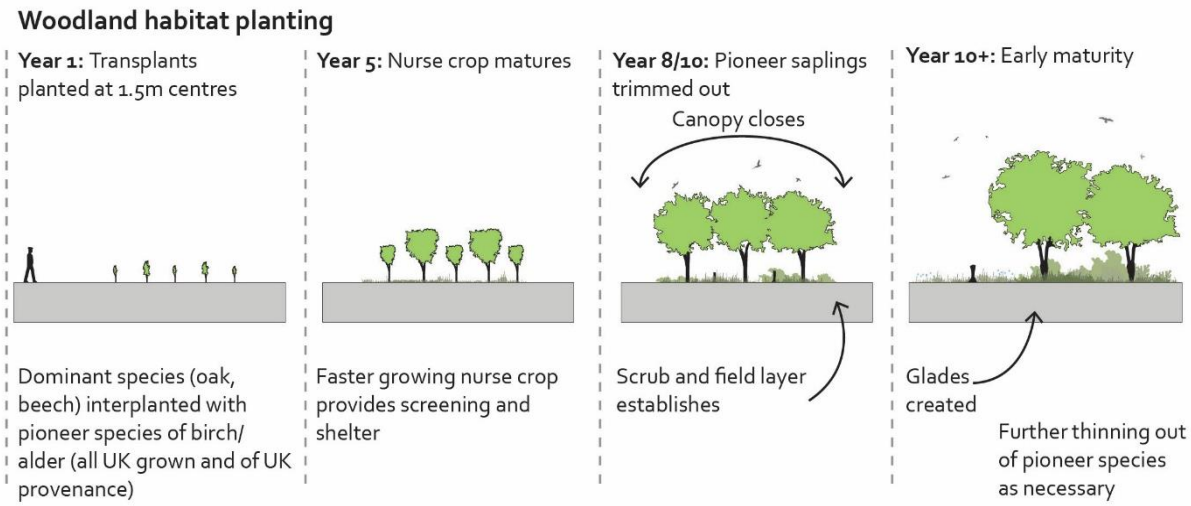


Figure 1: Woodland habitat planting

3.3 Ancient woodland translocation and new native woodland planting

3.3.1 Ancient woodland cannot be recreated and as a consequence it is recognised as irreplaceable within the timeframe of the Proposed Scheme. To recompense for loss of ancient woodlands one or more of the following measures may be implemented at each ancient woodland site, as appropriate:

- soil translocation (to utilise seed banks present in the ancient woodland soil);

- translocation of coppice stools, and other small trees; and/or
- translocation of fallen or standing deadwood.

3.3.2 Where it is shown to be appropriate (see method for establishing whether this is the case in the Ecology Specification Design document HS2-HS2-EV-STD-000-000017) a proportion of ancient woodland soil with its associated seed bank will be salvaged and translocated to respective pre-prepared ecological compensation areas. These areas will also be planted with a mix of broad-leaved trees to increase the extent of existing woodland and the connectivity of planting within the wider landscape. All native planting that recompenses for loss of ancient woodlands will utilise 2/3 of plant stock from the same region of provenance and 1/3 of plant stock from regions up to 2 ° latitude south. But at the detailed design stage there will flexibility to increase the proportion of stock from 2+ ° latitude south if appropriate for the specific site. Species that are characteristic and appropriate to the area concerned will be selected.

3.3.3 Woodland translocation will take place in the dormant season in autumn/early winter under normal weather conditions. The methods of translocation of different woodlands will differ and therefore consideration will need to be given to the geological and topographical conditions. Soil testing, seed viability trials and bio-security will also be required prior to translocation at all locations identified in order to ensure that conditions are suitable and to minimise the risk of spreading disease.

3.3.4 It is likely that, after tree felling and grubbing up roots, only 20-40% of the topsoil at the source site will be able to be translocated to the new ancient woodland site, although thinning this soil with an appropriate medium may also be possible.

3.3.5 The depth of soil to be excavated and translocated will depend upon the woodland type, the soil type and the underlying geology. Consideration will be given to the translocation of a more extensive soil horizon to maximise the retention of the existing mycorrhizal fungi but this will be further investigated on a site by site basis.

3.3.6 Due to the advanced techniques used in ancient woodland soil translocation there will be ongoing site monitoring and research of all translocation sites for 20+ years, which will follow independent and good practice guidance in forestry research. These principles are illustrated in Figure 2 below.

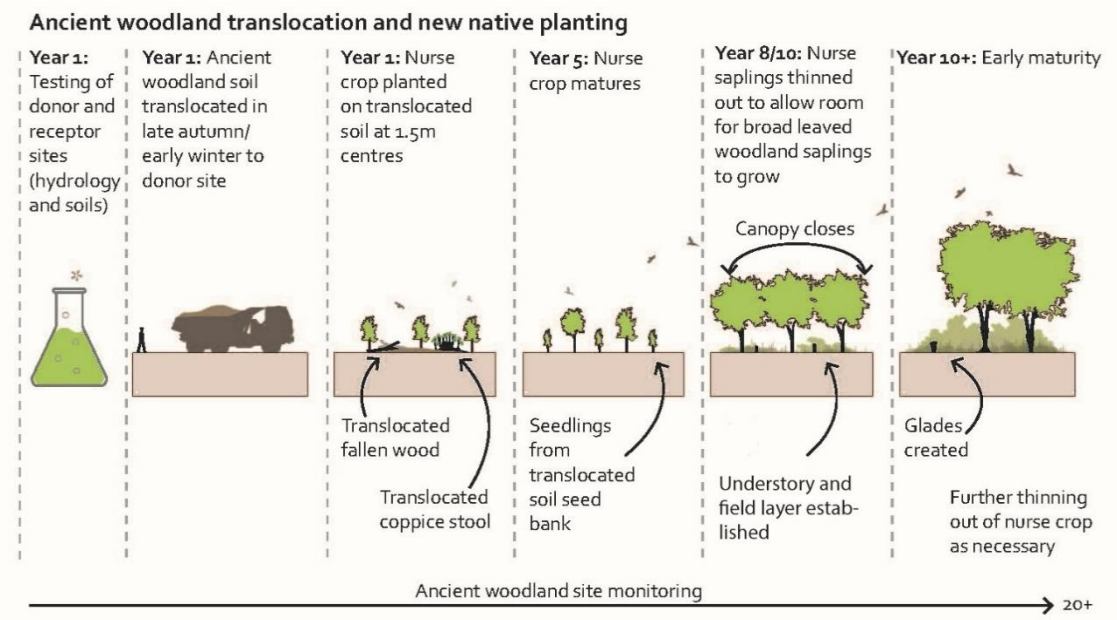


Figure 2: Ancient woodland translocation and new native planting

3.4 Landscape planting

3.4.1 Landscape planting will aim to:

- integrate the Proposed Scheme into the landscape;
- compensate for planting removed during construction;
- create ecological habitats;
- create new landscape features;
- provide interest for rail passengers; and
- mark 'events' such as station approaches.

3.4.2 Where proposed, landscape planting will incorporate transition planting and open glades to promote biodiversity and create a natural appearance. Plant species will be native but non-native or 'near-native' species will be considered outside of areas of ancient woodlands, SSSIs and ecologically-driven planting. Species may be chosen either for their contribution to the character of an area (e.g. London plane trees as an urban park or street tree) or for their biodiversity value (e.g. Oak, Birch and Thorn). Species may also be selected for their resilience to climate change, particularly in urban areas, where a biodiversity benefit can also be demonstrated. Species with a known low resilience to diseases (e.g. elm, ash) will not be planted unless there is a specific reason to do so and this is supported by advice from specialists such as the Forestry Commission.

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