

HS2

Phase 2a: 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 1600AD. Ancient woodlands are complex ecosystems and they take hundreds of years to establish. As such they are irreplaceable. Both ancient semi-natural woodland and plantations on ancient woodland sites are afforded equal policy protection under the National Planning Policy Framework.
- 1.1.2 In accordance with the recommendations of Natural England's review of HS2 Ltd's no net loss in biodiversity metric, ancient woodland and the compensatory measures to be provided in response to ancient woodland losses are not included in HS2 Ltd's no net loss calculation.
- 1.1.3 An Ancient Woodland Strategy was prepared for HS2 Phase One¹ to provide an area-based comparison between losses of ancient woodland and the compensatory measures that would be adopted in response. HS2 Ltd has prepared and submitted a further hybrid Bill to Parliament in July 2017 for an additional section of high speed rail between the West Midlands and Crewe. This is known as HS2 Phase 2a. An Ancient Woodland Strategy² was prepared to provide additional information on ancient woodlands that will be affected by Phase 2a. Its structure and content mirrors the Ancient Woodland Strategy for HS2 Phase One.
- 1.1.4 Following the deposit of the Bill, the need for a number of amendments to the Proposed Scheme (i.e. changes that require amendments to the Bill) was identified. These amendments were promoted in Parliament in March 2018 through an Additional Provision ('AP1') and in February 2019 through a second Additional Provision ('AP2'), together with their Environmental Statements ('AP1ES' and 'AP2ES'). Both AP ESs were also accompanied by Supplementary Environmental Statements ('SES1' and 'SES2'), which reported changes to the design not requiring amendments to the Bill, changes to construction assumptions, new environment baseline information and corrections to the main ES. The amendments and design changes reported arose through the Select Committee process, ongoing discussions with stakeholders and as a result of design refinements.
- 1.1.5 The purpose of this document is to provide additional information on ancient woodlands that will be affected by Phase 2a, taking account of the changes to the Proposed Scheme as a result of AP1 ('AP1 revised scheme') and AP2 ('AP2 revised scheme'). The following key changes have occurred since the previous issue of the Ancient Woodland Strategy:

¹ HS2 Ltd (2017). High Speed Two Phase One: London-West Midlands. Ancient Woodland Strategy. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664737/hs2_phase_one_ancient_woodland_strategy.pdf

² HS2 Ltd (2018). High Speed Two Phase 2a: West Midlands-Crewe. Ancient Woodland Strategy. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/682444/hs2_phase_2a_ancient_woodland_strategy.pdf

- removal of the grid supply point connection to Rugeley Power Station, therefore the Proposed Scheme is no longer located directly adjacent to Cawarden Springs Wood ancient woodland;
- provision of a grid supply point connection to the National Grid Parkgate substation resulting in direct impacts to Lower Birches Plantation / Titler's Plantation ancient woodland;
- reduced loss of ancient woodland at Whitmore Wood;
- increased area of ancient woodland that will be subject to enhancement at Whitmore Wood; and
- reduced loss of ancient woodland at Hey Sprink (Wood south-west of).

- 1.1.6 This document sets out the Ancient Woodland Strategy for HS2 Phase 2a. It also provides an area-based comparison between the losses of ancient woodland habitat that will occur as a consequence of the construction of Phase 2a and the associated package of compensatory measures to be provided in response to those losses that cannot reasonably be avoided.
- 1.1.7 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 used to inform the strategy.
- 1.1.8 The strategy does not seek to define national policy regarding avoidance, mitigation and compensation for ancient woodlands. It represents a project specific approach based upon the predicted impacts of the Proposed Scheme and application of ecological expertise and appropriate professional judgement.
- 1.1.9 The route-wide assessment reported in Volume 3 of the High Speed Rail (West Midlands - Crewe) SES2 and AP2 ES identifies a loss of approximately 9.8ha of ancient woodland within Staffordshire. This is a residual adverse effect at the national level. There will be no loss of ancient woodland in Cheshire due to HS2 Phase 2a.
- 1.1.10 The largest scale of loss will be from Whitmore Wood, where the loss of approximately 5.5ha represents more than half of the total loss of ancient woodland due to Phase 2a. This loss includes approximately 1ha of broad-leaved semi-natural ancient woodland and 4.5ha of plantations on ancient woodland sites.

- 1.1.11 A total of 11 ancient woodlands will be subject to direct impacts to their habitat as a consequence of Phase 2a, this includes habitat loss at 10 ancient woodlands and damage to the habitats of one ancient woodland. The habitat impacted will be less than 1ha at eight of these woodlands. No other ancient woodlands are expected to be subject to significant adverse effects.
- 1.1.12 Where effects on ancient woodland cannot be reasonably avoided, HS2 Ltd has committed to provide a range of compensation measures in response to these losses. The compensation measures for the loss of 9.8ha of ancient woodland include 78ha of new woodland planting, the translocation of up to 9.6ha of ancient woodland soils and enhancement of 13.4ha of ancient woodland.
- 1.1.13 No set ratios of loss and gain have been used in determining an appropriate level of compensation response. The level of compensation provision included in each case has been derived through professional judgement, taking into account the scale of the impacts and the condition of the woodland affected, which differ in terms of both the existing habitat structure and the diversity of the areas concerned.
- 1.1.14 In accordance with the HS2 Code of Construction Practices³ and the Environmental Minimum Requirements⁴, during detailed design and construction, efforts will be made to seek to avoid or further reduce the impacts of the scheme.
- 1.1.15 As detailed design is undertaken, HS2 Ltd will look at opportunities to avoid or further reduce the effect on ancient woodland where practicable. As this further information becomes available, HS2 Ltd will continue to work with local landowners, Natural England and other relevant bodies to refine the compensation strategy for each woodland.

³ HS2 Ltd (2017). High Speed Two Phase 2a: West Midlands-Crewe. Environmental Statement. Volume 5: Technical appendices. Draft Code of Construction Practice (CT-003-000). Available online at

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627182/E26_CT-003-000_WEB.pdf

⁴ HS2 Ltd (2019). High Speed Two Phase 2a: West Midlands-Crewe. Environmental Minimum Requirements for HS2 Phase 2a. Available online at <https://www.gov.uk/government/publications/environmental-minimum-requirements-for-hs2-phase-2a>

2 Abbreviations, acronyms and descriptions

Table 1: Abbreviations, acronyms and descriptions

Abbreviation/acronym	Description
AP1	Additional Provision 1
AP2	Additional Provision 2
ASNW	Ancient Semi-Natural Woodland
AWI	Ancient Woodland Inventory
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
ha	hectare
km	kilometre
m	metre
ES	Environmental Statement
EMR	Environmental Minimum Requirements
LWS	Local Wildlife Site
BAS	Biodiversity Alert Site
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NVC	National Vegetation Classification
PAWS	Plantations on ancient woodland sites
SSSI	Site of Special Scientific Interest
SINC	Site of Importance for Nature Conservation
SMR	Scope and Methodology Report
WCML	West Coast Main Line

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 (HS2 Phase One) received Royal Assent in February 2017. The ES submitted with the hybrid Bill and its additional provisions included assessment of the effects on ancient woodland and described the mitigation measures to reduce effects and compensatory measures to be undertaken where avoidance was not possible. Further detail was provided in an Ancient Woodland Strategy, which did not form part of the ES but was used to assist in consultation with stakeholders, especially Natural England and the Woodland Trust.
- 3.1.2 HS2 Ltd prepared and submitted a further hybrid Bill to Parliament in July 2017 for an additional section of high speed rail between West Midlands and Crewe, known as Phase 2a.
- 3.1.3 Following the deposit of the Bill, the need for a number of amendments to the Proposed Scheme (i.e. changes that require amendments to the Bill) was identified. These amendments were promoted in Parliament in March 2018 through an Additional Provision ('AP1') and in February 2019 through a second Additional Provision ('AP2'), together with their Environmental Statements ('AP1ES' and 'AP2ES'). Both AP ESs were also accompanied by Supplementary Environmental Statements ('SES1' and 'SES2'), which reported changes to the design not requiring amendments to the Bill, changes to construction assumptions, new environment baseline information and corrections to the main ES. The amendments and design changes reported arose through the Select Committee process, ongoing discussions with stakeholders and as a result of design refinements.
- 3.1.4 The purpose of this document is to provide additional information on ancient woodlands that will be affected by Phase 2a, taking account of the changes to the scheme as a result of AP1 (the AP1 revised scheme) and AP2 (the AP2 revised scheme). Its structure and content mirrors the Ancient Woodland Strategy for HS2 Phase One. The HS2 Phase 2a scheme is referred to in this report as the Proposed Scheme, which is the scheme as deposited at hybrid Bill. Where the Proposed Scheme has been amended by either the AP1 revised scheme or the AP2 revised scheme then this is stated.
- 3.1.5 The following key changes have occurred since the previous issue of the Ancient Woodland Strategy:
- removal of the grid supply point connection to Rugeley Power Station therefore the Proposed Scheme is no longer located directly adjacent to Cawarden Springs Wood ancient woodland (previously no loss);

- provision of a grid supply point connection to the National Grid Parkgate substation resulting in direct loss (0.2ha) to Lower Birches Plantation / Titler's Plantation ancient woodland (previously no impact);
- reduced loss of ancient woodland (5.5ha) at Whitmore Wood (previously 6ha);
- increased area of ancient woodland (13.4ha) that will be subject to enhancement at Whitmore Wood (previously 12.9ha); and
- reduced loss of ancient woodland (0.1ha) at Hey Sprink (Wood south-west of) (previously 0.2ha).

3.1.6 A number of undertakings and assurances were given by HS2 Ltd to provide further commitments to the implementation of existing controls and requirements in seeking to protect ancient woodland impacted as a result of the construction or operation of the Proposed Scheme.

3.2 Background to HS2's Ancient Woodland Strategy

3.2.1 A review undertaken by Natural England in 2016 recommended that ancient woodland should be excluded from HS2 Ltd's no net loss in biodiversity calculation. This recommendation was accepted by HS2 Ltd. Ancient woodland and associated compensation measures, therefore, fall outside of the scope of the HS2 Ltd no net loss calculation for replaceable habitats.

3.2.2 This document, the HS2 Phase 2a Ancient Woodland Strategy, provides an area-based comparison of the unavoidable losses of ancient woodland habitat that will occur as a consequence of the Proposed Scheme and the associated package of compensation measures to be provided in response to those losses.

3.2.3 The strategy does not seek to define national policy regarding avoidance, mitigation and compensation for ancient woodlands. It represents a project specific approach based upon the predicted impacts of the Proposed Scheme and application of ecological expertise and appropriate professional judgement.

4 Context for HS2's Ancient Woodland Strategy

4.1 Introduction

4.1.1 This Section provides background information relating to the role of the Ancient Woodland Strategy for the Proposed Scheme, 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 advice⁵ defines ancient woodland as any wooded area that has been wooded continuously since at least 1600 AD. It includes:

- ancient semi-natural woodland (ASNW) - mainly made up of trees and shrubs native to the site, usually arising from natural regeneration; and
- plantations on ancient woodland sites (PAWs) - replanted with conifer and broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi.

4.2.2 Section 175 of The National Planning Policy Framework (NPPF)⁶ sets out a series of principles that should be taken into account when determining planning submissions, which includes the following in relation to ancient woodland:

"Development resulting in the loss of deterioration of irreplaceable habitats (such as ancient woodland and ancient of veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists."

4.2.3 The accompanying National Planning Practice Guidance (NPPG)⁷ 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."

4.2.4 All ancient woodlands are, therefore, afforded equal policy protection, and all losses of ancient woodland are considered irreplaceables.

4.2.5 England's biodiversity strategy for the period up to 2020⁸ 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 value)...."

4.2.6 Beyond the 2020 targets, the Government's 25 Year Environment Plan⁹ states that:

⁵ Natural England and Forestry Commission (2018), *Ancient Woodland and veteran trees: protecting them from development*. Available at: <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>

⁶ Ministry of Housing, Communities and Local Government (MHCLG) (2019), *National Planning Policy Framework*, DCLG, London. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁷ Gov.uk (2019), *National Planning Practice Guidance - Natural Environment*. Available at: <https://www.gov.uk/guidance/natural-environment>

⁸ Defra (2011), *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*, Defra, London. Available at:

<https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

⁹ Gov.UK (2018) A Green Future: Our 25 Year Plan to Improve the Environment. <https://www.gov.uk/government/publications/25-year-environment-plan>

“We are committed to ensuring stronger protection of our ancient woodlands, making sure they are sustainably managed to provide a wide range of social, environmental, societal and economic benefits”

- 4.2.7 In considering schemes where impacts on ancient woodland are likely to occur Natural England’s standing advice in relation to ancient woodland 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.

4.3 Ancient woodland inventory

- 4.3.1 The Ancient Woodland Inventory (AWI) was established in the early 1980s by the Nature Conservancy Council utilising a range of historic data from old maps and documents, alongside field survey information and aerial photograph interpretation to identify all woodland in Britain that had existed since 1600 AD.
- 4.3.2 Only woodland sites over 2ha (on the 1920s 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 ancient¹⁰. Natural England (who maintain and update the Inventory in England) have, in recent years, added to the Inventory some areas of ancient woodland that are less than 2ha in size in those areas 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 Nature Conservancy Council project have remained within the Inventory even where there have been subsequent losses from those sites that have reduced the area of ancient woodland remaining in the site to less than 2ha. It should be noted that the detail provided in the standing advice applies to all ancient woodlands, whether on inventories or not.
- 4.3.3 The AWI currently lists over 22,000 ancient woodlands in England. However, it is classed as provisional because it is a live dataset. Natural England consider new evidence on woodlands when received and may add sites or remove them on assessment of that evidence, if it proves or disproves the longevity of the site. Natural England’s website states that:

“Ancient woodland is identified using presence or absence of woods from old maps, information about the wood’s name, shape, internal boundaries, location relative to other features, ground survey and aerial photography”.

- 4.3.4 On the basis that the AWI is provisional and does not include woodlands smaller than 2ha, HS2 Ltd commissioned a heritage review of all woodlands that may be affected by the Proposed Scheme. This review considered all available data for these sites (including historic mapping) to verify their status. The evidence base was discussed with the Woodland Trust and their views were

¹⁰ Natural England, *Ancient Woodland Inventory (Open Data Geoportal)* – dataset accessible from: <http://naturalengland-defra.opendata.arcgis.com/>

taken into consideration prior to concluding which woodlands HS2 Ltd would recommend for inclusion in the AWI.

- 4.3.5 This evidence was then provided to Natural England, who confirmed the addition of the recommended woodlands to the Inventory. These woodlands were, therefore, considered to be ancient woodland for the purposes of the environmental impact assessment reported in the ES and detailed in this report. An additional assessment was undertaken since the publication of the main ES in relation to ancient woodland identified within proximity to the grid supply point connection to the National Grid Parkgate substation, as detailed in this report.

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 loss of 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 Proposed Scheme these losses have been recorded within the ES reports as permanent adverse residual effects. Further information on the options explored to feasibly amend the Proposed Scheme to reduce impacts on ancient woodlands is found in the Volume 5 Alternatives Report¹¹, and includes a retained cut option through Whitmore Wood (reducing the land take by 30% compared to baseline).
- 4.4.2 Avoidance, mitigation and compensation measures have been incorporated into the Proposed Scheme in accordance with the mitigation hierarchy, as set out in further detail in the Ecological Principles of Mitigation within the SMR Addendum¹². The ES documents the avoidance, mitigation and compensation measures that have been incorporated into the Proposed Scheme.
- 4.4.3 The Proposed Scheme has been designed, where reasonably practicable, to avoid impacts on sensitive ecological receptors. However, given the scale of the Proposed Scheme, and a series of sometimes conflicting environmental constraints, there are locations where impacts on ecological receptors 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, construction and environmental teams and has been informed by the consultation and engagement process associated with the ES.

¹¹ HS2 Ltd (2017), *High Speed Rail (West Midlands - Crewe) Environmental Statement, Alternatives Report, Volume 5: Appendix CT-002-000*

¹² HS2 Ltd (2017), *High Speed Rail (West Midlands - Crewe) Environmental Statement, Environmental Impact Assessment Scope and Methodology Report Addendum, Volume 5: Appendix CT-001-002*

- 4.4.5 Where avoidance and mitigation measures are not considered sufficient to address the effects of the Proposed Scheme then compensation, in the form of habitat creation, or the enhancement of retained habitat has been proposed. It should be noted that enhancement works carried out will be bespoke to each site and will include a variety of woodland management activities including invasive plant species removal, woodland thinning and fencing to prevent animal grazing damage.
- 4.4.6 Where losses of ancient woodland are expected to occur, a range of compensatory measures are proposed by HS2 Ltd, these are:
- translocation of ancient woodland soils;
 - translocation of coppice stools;
 - new woodland creation; and
 - enhancement and/or restoration of existing woodlands (ancient and non-ancient).
- 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 Proposed 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 of the woodland affected, before consolidating this into a suitable compensation strategy for the wider local area (e.g. creating larger areas of woodland in one location by consolidating smaller areas of woodland compensation rather than creating more small areas of woodland creation close to the original loss). This process did not involve the use of a biodiversity offsetting metric or other loss to gain ratios.
- 4.4.9 The approach to determining the level of compensation included within the Proposed Scheme has, therefore, been no different to that traditionally used by all major UK infrastructure projects over the last 30 years.
- 4.4.10 The location and design of habitat creation areas, including woodland, has sought (where possible) to adhere to the key Lawton Review¹³ principles of '*more, bigger, better and joined up*'. These aim to result in habitat creation areas which will also enhance and connect habitat parcels within the local area. These measures also support climate change requirements by increasing the resilience of ecological networks.
- 4.4.11 The detailed design of the Proposed Scheme is yet to be undertaken, and therefore, there remain opportunities to reduce effects on ancient woodland. In addition, there may be the potential to

¹³ Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.

refine the compensatory measures currently proposed where this can be achieved through agreement with landowners and stakeholders, and without delay to the project programme.

- 4.4.12 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. Details about soil translocation are provided in the Technical Standard - Ecology¹⁴ and an extract is provided in Appendix 1. 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

- 3.1.1 The scope of the Ancient Woodland Strategy for the Proposed Scheme covers the following:
- all ancient woodlands identified to be impacted by the Proposed Scheme within the ES; and
 - all compensatory habitat creation and habitat enhancement currently proposed in response to the loss of ancient woodland.
- 5.1.1 All areas of habitat that are considered within the Ancient Woodland Strategy are excluded from the scope of the HS2 Ltd 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.
- 5.1.2 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.
- 5.1.3 It is expected that all future relevant information relating to each ancient woodland will be captured within the respective ESMP and not in an updated Ancient Woodland Strategy.
- 5.1.4 For each ancient woodland, a table has been produced containing relevant content relating to the expected impacts, and the proposed compensation in response to these losses under a series of standard headings as set out in Table 2.

Table 2: Information provided for each ancient woodland affected by the scheme

¹⁴ HS2 Ltd Technical Standard Rev P15 (2019) – Ecology.

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	Chartered Institute of Ecology and Environmental Management (CIEEM) geographic frame of reference allocated within the ES.
Measures taken to avoid or reduce impacts	Summary of measures incorporated during the Proposed Scheme design to date that have served to avoid or reduce impacts on ancient woodlands.
Impacts and associated effects	Details of the expected areas of ancient woodland affected by the Proposed Scheme in hectares (ha), and the geographical level at which the resultant effect is considered to be significant. ¹⁵
Compensatory measures	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.

5.2 Data sources

5.2.1 Table 3 provides a summary of key data sources that informed the production of HS2 Ltd's Phase 2a Ancient Woodland Strategy.

¹⁵ Woodland planting figures included within this section of the table include areas of woodland planting that will be provided to compensate for the loss of ancient and non-ancient woodland within this area, this approach has been taken to ensure larger, coherent woodlands are provided that have greater ecological functionality.

Table 3: Summary of key data sources utilised in the Ancient Woodland Strategy

Data type	Description	Source(s)
Natural England AWI	Location of ancient woodlands	Natural England via data.gov.uk website ¹⁶
Statutory site designation details	Citations for woodlands affected by the Proposed Scheme that are designated as statutory nature conservation sites	Natural England ¹⁷ Multi-Agency Geographic Information for the Countryside (MAGIC) ¹⁸
Non-statutory site designation details	Designation details for non-statutory sites for nature conservation. This data was obtained from the Staffordshire Ecological Record	Staffordshire Ecological Record Centre
Historic maps	Historic map regression using publicly available early maps including estate, survey, tithe, and available Ordnance Survey maps	Historic maps and documents obtained from Stafford Record Office, Lichfield Record Office, Cheshire Record Office and William Salt Library (21 st March 2016 -26 th April 2016)
Field data from HS2 habitat surveys	Phase 1 habitat survey and National Vegetation Classification (NVC) survey data from field surveys undertaken by HS2 Ltd, where access has been available	HS2 Phase 2a ES Volume 5: Ecology and biodiversity appendices ¹⁹
Archaeological record	Review of archaeological record	HS2 Phase 2a ES Volume 5: Cultural heritage appendices ²⁰

¹⁶ Data.gov.uk (2016), *Ancient Woodlands (England)*, Available online at: <https://data.gov.uk/dataset/ancient-woodlands-england1>

¹⁷ Natural England website. Available online at: http://www.lnr.naturalengland.org.uk/Special/Lnr/Lnr_search.asp and <https://designatedsites.naturalengland.org.uk/SiteSearch.aspx>

¹⁸ Multi-Agency Geographic Information for the Countryside. Available online at: <http://www.magic.gov.uk/>

¹⁹ HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe) Background Information and Data*: BID-EC-002-000 and BID-EC-004-000. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement#background-information-and-data>

²⁰ HS2 Ltd (2017), *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Cultural Heritage Appendix CH-001-001 to CH-001-005. Available online at: <https://www.gov.uk/government/publications/hs2-phase-2a-environmental-statement-volume-5-cultural-heritage>

Data type	Description	Source(s)
Soils data	Soils data for the Proposed Scheme as reported in the agriculture, forestry and soils assessment	HS2 Phase 2a ES Vol 5: Agriculture, forestry and soils ²¹
Aerial photography	Review of aerial photography surveys	HS2 Ltd (fly over aerial photography of the route alignment)

5.3 Constraints

- 5.3.1 During the review of historical data, maps and documents it was not always possible to obtain access to all pre-19th 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.
- 5.3.2 Due to access restrictions it has not been possible to access all affected ancient woodland sites to undertake field surveys to inform this report. Where baseline survey continues to not be 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.
- 5.3.3 Detailed assessment of the soil conditions at the ancient woodland sites and the associated proposed donor sites for ancient woodland soils have not been undertaken to date. The proposed soil translocation donor sites are, therefore, subject to change following detailed surveys of the soils compatibility with those to be translocated from the ancient woodlands.

²¹ HS2 Ltd (2017), *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Agriculture, Forestry and Soils Appendix AG-001-001 to AG-001-005. Available online at: <https://www.gov.uk/government/publications/hs2-phase-2a-environmental-statement-volume-5-agriculture-forestry-and-soil>

5.4 Route-section specific assumptions

Fradley to Colton – Community area 1 (CA1)

- 5.4.1 The ancient woodlands of Big Lyntus and Little Lyntus fall within the land required for rail systems work associated with the connection of power between HS2 Phase One and the Proposed Scheme. These rail systems works will not result in any impacts on these sites and there will be no significant effects, therefore, these sites are not discussed further within this report. Both woodlands will be directly impacted by works associated with HS2 Phase One, and therefore, are reported in detail within the HS2 Phase One Ancient Woodland Strategy.
- 5.4.2 The ancient woodlands of John's Gorse LWS and Hanch Wood (also known as Hanchwood House Wood) fall within the land required for construction of HS2 Phase One, and within the land required for the AP2 amendment relating to alterations to the Handsacre Junction connection into the West Coast Main Line (AP2-001-001)²². As reported in the HS2 Phase One Ancient Woodland Strategy, the construction of HS2 Phase One will result in the loss of approximately 2.7ha of ancient woodland across John's Gorse and Hanch Wood. The AP2 amendment (AP2-001-001) will not give rise to new or different significant effects upon John's Gorse LWS and AWI site, or Hanch Wood AWI site, and will not change the level of significance reported in the HS2 Phase One Ancient Woodland Strategy, therefore, these sites are not discussed further within this report.
- 5.4.3 Westfield Covert is directly adjacent to both an existing highway, which is included within the land required for the Proposed Scheme, as well as a large area of woodland habitat creation. There will be no direct impacts to Westfield Covert and indirect effects will be controlled through implementation of measures detailed in the draft Code of Construction Practice (CoCP), therefore, this site is not discussed further within this report.
- 5.4.4 Pipe Wood Local Wildlife Site (LWS) and Ancient Woodland Inventory Site (AWI) sits adjacent to a site proposed for the relocation of Mayfield Children's Home. The works would comprise the development of a replacement facility on the site of the former Westwood School, adjacent to Rugeley School. The closest point of construction of the facility is directly adjacent to Pipe Wood LWS and AWI site. Potential indirect effects, such as noise, dust and altered lighting would be controlled through the implementation of avoidance and protection measures set out in the draft CoCP. These works will not result in any direct impacts on this site and there will be no significant effects, therefore, this site is not discussed further within this report.

- 5.4.5 The AP2 amendment relating to the grid supply point connection to National Grid Parkgate substation (AP2-001-015)²² will remove the requirement for the grid supply point connection to Rugeley Power Station as reported within the main ES. As such, Cawarden Springs Wood ancient woodland is no longer located directly adjacent to the land required for the Proposed Scheme as reported within the previous version of this report.

Colwich to Yarlet – Community area 2 (CA2)

- 5.4.6 The ancient woodlands at Tithebarn Covert, Ingestre Wood and Lambert's Coppice are located directly adjacent to land required for the Proposed Scheme for the purposes of woodland or grassland habitat creation. These works will not result in any impacts on these sites and there will be no significant effects, therefore, these sites are not discussed further within this report.

Stone and Swynnerton – Community area 3 (CA3)

- 5.4.7 Swynnerton Old Park is located directly adjacent to the land required for the Proposed Scheme for the purposes of woodland habitat creation. These works will not result in any impacts on this site and there will be no significant effects, therefore, this site is not discussed further within this report.
- 5.4.8 Trent Wood Local Wildlife Site (LWS) and Ancient Woodland Inventory Site (AWIS) sits adjacent to the land required for the Proposed Scheme for the permanent diversion of an underground telecommunications cable along the A34 Fillybrooks and A51 Bury Bank). The works, which comprise the permanent removal of an underground telecommunications cable and the installation of the new diverted utility, would be entirely contained within the highway boundary of the A34 where this passes adjacent to the boundary of Trent Wood. Potential indirect effects, such as noise, dust and altered lighting would be controlled through the implementation of avoidance and protection measures set out in the draft CoCP. These works will not result in any impacts on this site and there will be no significant effects, therefore, this site is not discussed further within this report.

²² HS2 Phase 2a Additional Provision ES2 Supplementary ES2 Volume 2: Community Area report. CA1: Fradley to Colton. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775951/J10_HS2_Phase_2a_AP2_ES_Volume_2_CA1_report.pdf

- 5.4.9 Tittensor Chase Local Wildlife Site (LWS) and Ancient Woodland Inventory Site (AWIS) sits adjacent to the land required for the second Additional Provision to the Bill (AP2) amendment for the provision of a power supply to Whitmore Heath tunnel. It is assumed that the works comprising the installation of two sets of cables laid underground within a single trench would be entirely contained within the highway boundary of Chase Lane where this passes adjacent to the boundary of Tittensor Chase. Potential indirect effects, such as noise, dust and altered lighting would be controlled through the implementation of avoidance and protection measures set out in the draft CoCP. These works will not result in any impacts on this site and there will be no significant effects, therefore, this site is not discussed further within this report.

Whitmore Heath to Madeley – Community area 4 (CA4)

- 5.4.10 The ancient woodlands at Graftons Wood and Wrinehill Wood are directly adjacent to the land required for the Proposed Scheme for the purposes of woodland, hedgerow and grassland habitat creation. These works will not result in any impacts on these sites and there will be no significant effects, therefore, these sites are not discussed further within this report.
- 5.4.11 Hey Sprink is partially within the land required for the Proposed Scheme for the purposes of an upgrade to an existing footpath, and directly adjacent to the Proposed Scheme in multiple locations for the purposes of woodland habitat creation. Effects from the footpath upgrade works will be controlled through implementation of measures within the draft CoCP. There will be no direct effects on Hey Sprink, therefore, this site is not discussed further within this report.

South Cheshire – Community area 5 (CA5)

- 5.4.12 There are no ancient woodlands within or directly adjacent to the land required for the Proposed Scheme in the South Cheshire area (CA5).

6 Affected ancient woodlands and associated compensatory measures

6.1 Introduction

6.1.1 Sections 6.2 to 6.12 of this report provide details of each of the ancient woodland sites that will be affected by the Proposed Scheme and the associated compensatory measures to be provided. The text descriptions provided for each woodland should be read in conjunction with the corresponding maps, which are included within Appendix 123.

6.1.2 Table 4, at the end of section 6.1, 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 In accordance with the measures detailed in the draft CoCP and the Environmental Minimum Requirements (EMRs), efforts will continue to be made during detailed design and construction to seek to avoid or further reduce the impacts of the Proposed Scheme on these sites. For example, through use of innovative design solutions (e.g. increasing cutting gradients), and construction methods. As a consequence, the areas of ancient woodland loss reported in the following sections are considered to be a worst-case, which may be improved upon during detailed design.

6.1.4 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 occurs, are provided below.

Translocation of ancient woodland soils

6.1.5 The detailed design of the Proposed Scheme has yet to be undertaken and, in some locations, it 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 will occur as a consequence of the Proposed Scheme, the soil material will be translocated to a suitable receptor site.

6.1.6 Sections 6.3 to 6.12 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:

- those sites where it is beneficial to undertake translocation of ancient woodland soils; and

²³ As a result of engagement with landowners, some of the compensatory areas are the subject of an assurance and therefore the current proposed design may be subject to change during detailed design. The changes that could result from the assurance are conditioned on the compensatory habitat retaining its intended function.

- the exact size and location of the receptor sites required.

- 6.1.7 The process of agreeing which woodlands support soils that are appropriate for translocation will involve consultation with Natural England and the Woodland Trust.
- 6.1.8 Where appropriate, translocation of coppice stools, saplings and dead wood will also be considered during detailed design of these habitat creation areas.
- 6.1.9 The area of soil donor sites (i.e. where ancient woodland will be lost) and the proposed ancient woodland soils receptor sites will be confirmed at detailed design. At this stage the area identified for receipt of translocated ancient woodland soils is generally of similar size to the area of ancient woodland lost. In practice, the area of recoverable soil will be less.
- 6.1.10 Where insufficient soil is recovered to cover the receptor site to an appropriate depth, the remainder of the area will be used for woodland planting.

Soil survey and physical characteristics

- 6.1.11 At present detailed soil survey information is not available for all potential donor and receptor areas, high level descriptions of the soil conditions are provided in Sections 6.3 to 6.12.
- 6.1.12 Detailed surveys 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 following: nutrient levels (including nitrogen (N), phosphorous (P), potassium (K) and magnesium (Mg)); soil texture; total depth; horizon thickness; rooting depth; soil pH and structure.

Woodland planting

- 6.1.13 The reporting of compensatory measures draws a distinction between areas that will be receptor sites for ancient woodland soils, and all other areas of compensatory planting that will be provided in response to ancient woodland losses.
- 6.1.14 Sections 6.2 to 6.12 report the areas of new woodland planting, which include those areas that will act as soil receptors (and will also, in due course be subject to planting).

²⁴ LandIs, Soil Associations in England and Wales. Available online at:
http://www.landis.org.uk/services/soilsguide/mapunit_list.cfm?sorttype_association=map_unit_name

Management and monitoring

6.1.15 HS2 Ltd has set out indicative commitments to the management and monitoring of ecology led habitat creation in support of the Proposed Scheme, during the period of establishment within *Information Paper E2 Ecology*²⁵.

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

Table 4: Ancient woodland strategy summary: habitat areas (ha) of each category

²⁵ HS2 (2019), *High Speed Two Phase 2a Information Paper – E2 Ecology*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828979/E2_Ecology_v1.1.pdf

Woodland name	Community area (CA) number	Approximate total woodland size (ha)	Direct loss of ancient woodland (ha)	Areas of ancient woodland within the area covered by the hybrid Bill that will be retained (ha)	Significant indirect effects on ancient woodland (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 (including ancient woodland soils receptor) (ha)	Enhancement of ancient woodland (ha)	Enhancement of non-ancient woodland (ha)
Lower Birches Plantation / Titler's Plantation	CA1	3.7*	0.2**	1.6	-	-	0.9	-	-
Flushing Covert	CA2	1.2	0.2	-	-	0.2	3.9	-	-
Town Field Plantation	CA2	0.4	0.1	-	-	0.1	2.2	-	-
The Grove	CA2	1.7	1.3	0.4	-	1.3	4.9	-	-
Birchwood	CA3	0.6	0.6	-	-	0.6	7.4	-	-
Clifford's Wood	CA3	16.9	1.3	-	-	1.3	13.6	-	-
Whitmore Wood	CA4	18.9	5.5	-	-	5.5	36.0 (combined area of planting in response to losses at three ancient woodland sites in CA4)	13.4	-
Hey Sprink (wood south-west of)	CA4	3.2	0.1	-	-	0.1		-	-

Woodland name	Community area (CA) number	Approximate total woodland size (ha)	Direct loss of ancient woodland (ha)	Areas of ancient woodland within the area covered by the hybrid Bill that will be retained (ha)	Significant indirect effects on ancient woodland (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 (including ancient woodland soils receptor) (ha)	Enhancement of ancient woodland (ha)	Enhancement of non-ancient woodland (ha)
Unnamed wood south of Hey Sprink	CA4	0.9	0.2	-	-	0.2		-	-
Barhill Wood	CA4	5	0.2	-	-	0.2	3.9	-	-
Wrinehill Wood (east of)	CA4	3.6	0.1	-	-	0.1	5.2	-	-
Totals	-		9.8	2	-	9.6	78	13.4	-

*It should be noted that the boundary for this woodland has been amended on the Ancient Woodland Inventory to exclude a small area of wetland. **The impact on Lower Birches Plantation / Titler's Plantation is damage as a result of vegetation management required beneath overhead powerlines rather than direct loss of the corridor of vegetation and associated soil, therefore there will be no requirement for an ancient woodland soil receptor area.

6.2 Lower Birches Plantation / Titler's Plantation (CA1)

Baseline conditions

- 6.2.1 Birches Plantation / Titler's Plantation covers approximately 3.7ha²⁶ and is partially located within the land required for the AP2 revised scheme. The woodland has not been subject to surveys due to access restrictions; however aerial photography suggests that the site supports semi-natural mixed broadleaved woodland located on the eastern bank of Pur Brook. The woodland sits within an agricultural landscape of pasture and arable fields, hedgerows and mixed broadleaved woodland. The ancient woodland inventory sites of Birch and Roosthill Woods and Chantry Wood are located to the south and east of Lower Birches Plantation / Titler's Plantation.

Valuation

- 6.2.2 On the basis of the heritage review undertaken by HS2 Ltd, Lower Birches Plantation / Titler's Plantation is considered to be potentially ancient. It has been recommended to Natural England that it is added to the AWI. Lower Birches Plantation / Titler's Plantation is of up to county value.

Impacts and associated effects

- 6.2.3 Lower Birches Plantation / Titler's Plantation is partially within the area subject to the AP2 amendment relating to the grid supply point connection to National Grid Parkgate substation (AP2-001-015)²⁷. The AP2 amendment will require the temporary diversion of an existing powerline, that already passes through a 50m wide managed corridor in the woodland. The works will involve lowering the height of any trees that would otherwise infringe on minimum clearances between the trees and the powerline. The impacts upon the ancient woodland for construction of the power line are likely to be reduced from those reported within the precautionary assessment within this report and the AP2 ES. The amendment will result in up to 0.2ha (5%) of additional woodland being subject to tree height reductions to comply with the minimum clearance below the temporary power line; whole trees and soil will not be removed. As ancient woodland cannot be recreated the permanent loss will remain an adverse effect that is significant at up to the county level.

Compensatory measures

- 6.2.4 Table 5 provides a summary of the compensatory measures that are proposed in response to the expected effects on Lower Birches Plantation / Titler's Plantation

Table 5: Ancient woodland strategy summary for Lower Birches Plantation/Titler's Plantation

²⁶ It should be noted that the boundary for this woodland has been amended on the Ancient Woodland Inventory to exclude a small area of wetland

²⁷ HS2 Phase 2a Additional Provision ES2 Supplementary ES2 Volume 2: Community Area report. CA1: Fradley to Colton. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775951/J10_HS2_Phase_2a_AP2_ES_Volume_2_CA1_report.pdf

Woodland	Lower Birches Plantation / Titler's Plantation	
CA	1	
Status	Woodland being added to the AWI	
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)		1.6
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)		0
Area of receptor site for ancient woodland soils (ha)*		0
Area of new planting to be provided in response to the loss of ancient woodland (including ancient woodland soil receptor area) (ha)		0.9
Area of enhancement of existing ancient woodland (ha)		0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland (ha)		0

*The impact on Lower Birches Plantation / Titler's Plantation is damage as a result of management required beneath overhead powerlines rather than direct loss, therefore there will be no requirement for an ancient woodland soil receptor area.

Translocation of ancient woodland soils

- 6.2.5 The impacted area of Lower Birches Plantation / Titler's Plantation will be subject to management to reduce the height of vegetation to comply with minimum clearance requirements beneath power lines, there will be no impact to ancient woodland soils and therefore no requirement for soil translocation.

Woodland planting

- 6.2.6 Approximately 0.9ha of native broadleaved woodland will be provided across three locations: directly adjacent to Lower Birches Plantation / Titler's Plantation and Birch and Roosthill Woods; adjacent to an existing woodland south of Newborough End Farm; and adjacent to existing woodland to the east of Chantry Farm (see Figure EC-26-609). This woodland habitat creation will partially compensate for the impact to approximately 0.2ha of ancient woodland at Lower Birches Plantation / Titler's Plantation.
- 6.2.7 The woodland planting has been designed to increase the size of two existing small woodlands as well as providing improved connectivity between Lower Birches / Titler's Plantation and Birch and Roosthill Woods ancient woodland, and non-ancient woodlands and semi-natural habitats within the local landscape. The woodland planting also connects to a larger area of woodland planting that mitigates non-ancient woodland losses immediately to the west of Lower Birches / Titler's Plantation. This connectivity will facilitate the dispersal of species between the retained areas of ancient and non-ancient woodland into these associated habitats.

6.3 Flushing Covert (CA2)

Baseline conditions

- 6.3.1 Flushing Covert covers approximately 1.2ha and is partially located within the land required for the Proposed Scheme. The woodland has not been subject to surveys due to access restrictions; however aerial photography suggests that the site supports semi-natural mixed broadleaved woodland with a large water body on its northern edge. The woodland sits within an agricultural landscape of pasture and arable fields with managed hedgerows and mixed broadleaved woodland. Ingestre Park Golf Club is located immediately to the north-west.

Valuation

- 6.3.2 On the basis of the heritage review undertaken by HS2 Ltd, Flushing Covert has been added to the AWI and is of county value.

Impacts and associated effects

- 6.3.3 Construction of Trent North embankment will result in the permanent loss of approximately 0.2ha (17%) of ancient woodland at Flushing Covert (see Figure EC-26-601). As ancient woodland cannot be recreated the permanent loss will remain an adverse effect that is significant at county level.

Compensatory measures

- 6.3.4 Table 6 provides a summary of the compensatory measures that are proposed in response to the expected effects on Flushing Covert.

Table 6: Ancient woodland strategy summary for Flushing Covert

Woodland	Flushing Covert	
CA	2	
Status	Ancient semi-natural woodland listed on the AWI	
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
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)		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 (including ancient woodland soil receptor area) (ha)		3.9
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

- 6.3.5 Soils and the associated seed bank from the affected 0.2ha of ancient woodland will be translocated to an area of woodland habitat creation located directly adjacent on the northern side of the retained area of Flushing Covert (see Figure EC-26-601).

Soil conditions

- 6.3.6 The soil conditions at the donor area of ancient woodland and the receptor area for the translocated soils are classified as 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.3.7 Approximately 3.9ha of native broadleaved woodland will be provided along the south side of Trent North embankment and Brancote South cutting (see Figure EC-26-601), which will partially compensate for the loss of approximately 0.2ha at Flushing Covert.
- 6.3.8 The woodland planting has been designed to connect ancient and non-ancient woodland parcels to landscape woodland planting on the Trent North embankment as well as to other semi-natural habitats retained along the south of the embankment in this location. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.4 Town Field Plantation (CA2)

Baseline conditions

- 6.4.1 Town Field Plantation covers approximately 0.4ha and is located partially within the land required for the Proposed Scheme within a tree belt that forms the southern and western boundary of Ingestre Park Golf Club. The woodland is semi-natural broadleaved dominated by beech *Fagus sylvatica* and hazel *Corylus avellana*, with frequent sycamore *Acer pseudoplatanus*, field maple *Acer campestre*, oak *Quercus robur*, holly *Ilex aquifolium* and elder *Sambucus nigra*. The understorey is dominated by bramble *Rubus fruticosus* with frequent red campion *Silene dioica*. The woodland sits at the edge of Ingestre Park Golf Club within a wider agricultural landscape of pasture and arable fields with managed hedgerows and mixed broadleaved woodland.

Valuation

- 6.4.2 On the basis of the heritage review undertaken by HS2 Ltd, Town Field Plantation has been added to the AWI and is of county value.

Impacts and associated effects

- 6.4.3 Construction of Brancote South cutting will result in the permanent loss of approximately 0.1ha (34%) of ancient woodland at Town Field Plantation (see Figure EC-26-602). As ancient woodland cannot be recreated the permanent loss will remain an adverse effect that is significant at county level.

Compensatory measures

- 6.4.4 Table 7 provides a summary of the compensatory measures that are proposed in response to the expected effects on Town Field Plantation.

Table 7: Ancient woodland strategy summary for Town Field Plantation

Woodland	Town Field Plantation	
CA	2	
Status	Ancient semi-natural woodland listed on the AWI	
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 ancient woodland impacted by significant indirect effects 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 (including ancient woodland soil receptor area) (ha)	2.2	
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

- 6.4.5 Soils and the associated seed bank from the affected 0.1ha of ancient woodland will be translocated to a woodland creation area to the north of Brancote South cutting, south of Ingestre Wood (see Figure EC-26-602). The soil receptor site is located within 500m of the site of the woodland loss from Town Field Plantation.

Soil conditions

- 6.4.6 The soil conditions at the donor area of ancient woodland and the receptor area for the translocated soils are classified as 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.4.7 Approximately 2.2ha of native broadleaved woodland will be provided on the northern side of Brancote South cutting (see Figure EC-26-602), which will partially compensate for the loss of approximately 0.1ha of Town Field Plantation.

- 6.4.8 The woodland planting has been designed to provide improved connectivity between existing ancient woodland, including Ingestre Wood, and non-ancient woodland and other semi-natural habitats within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.5 The Grove (CA2)

Baseline conditions

- 6.5.1 The Grove covers approximately 1.7ha and is located within the land required for the Proposed Scheme, at Yarlet Hill. The woodland has not been subject to surveys due to access restrictions, however aerial photography suggests that the site supports semi-natural mixed broadleaved woodland. The Grove sits within an agricultural landscape of pasture and arable fields with managed hedgerows and scattered field ponds. There is limited other woodland within the immediate vicinity.

Valuation

- 6.5.2 On the basis of the heritage review undertaken by HS2 Ltd, The Grove has been added to the AWI and is of county value.

Impacts and associated effects

- 6.5.3 Construction of Yarlet South cutting will result in the permanent loss of approximately 1.3ha (76%) of ancient woodland at The Grove (see Figure EC-26-603). As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.5.4 Table 8 provides a summary of the compensatory measures that are proposed in response to the expected effects on The Grove.

Table 8: Ancient woodland strategy summary for The Grove

Woodland	The Grove	
CA	2	
Status	Ancient semi-natural woodland listed on the AWI	
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)	0.4	
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)	0	
Area of receptor site for ancient woodland soils (ha)	1.3	
Area of new planting to be provided in response to the loss of ancient woodland (including ancient woodland soil receptor area) (ha)	4.9	
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

6.5.5 Soils and the associated seed bank from the affected 1.3ha of ancient woodland will be translocated to two woodland creation areas either side of Yarlet South cutting (see Figure EC-26-603).

6.5.6 Both ancient woodland soil receptor sites are located within 50m of site of the woodland loss at The Grove. The receptor area on the south-west side is located directly adjacent to Yarlet Wood and the receptor area on the northern side is within an area of woodland, grassland and pond creation to the south of Yarlet.

Soil conditions

6.5.7 The soil conditions at the donor area of ancient woodland and the receptor area for the translocated soils are classified as 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.5.8 Approximately 4.9ha of native broadleaved woodland will be provided in four locations: on the northern side of Yarlet South cutting; immediately adjacent to the existing location of The Grove; and two areas south of Marston North embankment on the northern side of Yarlet Lane (see Figure EC-26-603). This will partially compensate for the loss of approximately 1.3ha at The Grove.
- 6.5.9 The woodland planting has been designed to provide connectivity with other areas of woodland, grassland and hedgerow creation with retained semi-natural habitats, such as those at Yarlet Wood, within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.6 Birchwood (CA3)

Baseline conditions

- 6.6.1 Birchwood covers an area of approximately 0.6ha of deciduous woodland and is located within the land required for the Proposed Scheme adjacent to the west of the M6 and the northern edge of the Highlow Meadows Local Wildlife Site (LWS). The woodland has not been subject to detailed surveys due to access and seasonal restrictions, however, the initial Phase 1 habitat survey confirmed that the site supports semi-natural mixed broadleaved woodland dominated by beech and sycamore.

Valuation

- 6.6.2 On the basis of the heritage review undertaken by HS2 Ltd, Birchwood has been added to the AWI and is of county value.

Impacts and associated effects

- 6.6.3 Construction of the Meaford North embankment leading to the M6 Meaford viaduct will result in the permanent loss of approximately 0.6ha (100%) of ancient woodland at Birchwood. As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.6.4 Table 9 provides a summary of the compensatory measures that are proposed in response to the expected effects on Birchwood.

Table 9: Ancient woodland strategy summary for Birchwood

Woodland	Birchwood	
CA	3	
Status	Ancient semi-natural woodland listed on the AWI	
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
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)		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 (including ancient woodland soil receptor area) (ha)		7.4
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

6.6.5 Soils and the associated seed bank from the affected 0.6ha of ancient woodland will be translocated to a 0.3ha woodland creation area on the north-east of the section of Lodge Covert on the western side of the M6, and a 0.3ha woodland creation area to the north of Hall Lane, adjacent to the northern edge of The Shrubs woodland (see Figure EC-26-604).

6.6.6 The proposed receptor sites are approximately 1.2km and 1.4km from the affected area of ancient woodland. In combination with the woodland planting this will increase the extent of woodland in this location and buffer Lodge Covert from the adjacent land uses.

Soil conditions

6.6.7 The soil conditions at the donor area of ancient woodland are classified as 'slightly acid loamy and clayey soils with impeded drainage', the soil conditions at the receptor area are classified as 'freely draining slightly acid loamy soils' and 'freely draining slightly acid sandy soils'.

Woodland planting

- 6.6.8 Approximately 1.7ha of native broadleaved woodland will be provided within an area contiguous with the larger area of woodland at Lodge Covert, 0.3ha of native broadleaved woodland will be provided contiguous with the larger area of woodland at The Shrubs and approximately 5.4ha of native broadleaved woodland will be provided adjacent to the current extent of Birchwood extending onto the slopes of the Meaford North embankment (see Figure EC-26-604). This will partially compensate for the loss of approximately 0.6ha (100%) of ancient woodland at Birchwood.
- 6.6.9 Woodland planting has been designed to connect retained sections of woodland, such as those at Lodge Covert and other areas of landscape planting, and hedgerows and grassland habitat creation. This connectivity will facilitate the dispersal of species from retained semi-natural habitats into these associated habitats.

6.7 Clifford's Wood (CA3)

Baseline conditions

- 6.7.1 Clifford's Wood covers an area of approximately 16.9ha and is designated as a LWS. The woodland is located partially within the land required for the Proposed Scheme, to the north of the A51 Stone Road and west of the A519 Newcastle Road. The ancient component of the woodland forms approximately 40% of a larger and well-connected wooded area of Clifford's Wood, which totals an area of approximately 42ha. The woodland is located within an agricultural landscape of predominantly pasture fields, with a well-established hedgerow network, mixed-broadleaved woodland blocks and scattered farm buildings.
- 6.7.2 The LWS is designated for its habitats comprising a mosaic of semi-natural broadleaved woodland dominated by pedunculate oak and beech with lime *Tilia* sp, sycamore and areas of mixed plantation including larch *Larix decidua* and scots pine *Pinus sylvestris*. The species composition within the broadleaved components is characteristic of NVC W10a *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland. The ground flora is dominated by bluebell *Hyacinthoides non-scripta*.

Valuation

- 6.7.3 On the basis of the heritage review undertaken by HS2 Ltd, Clifford's Wood has been added to the AWI. Clifford's Wood is also designated as a LWS. Clifford's Wood is of county value.

Measures taken to avoid or reduce impacts

- 6.7.4 A refinement of the location of a balancing pond has been included as part of the design of the Proposed Scheme to reduce the loss of woodland at Clifford's Wood.

Impacts and associated effects

- 6.7.5 Construction of Swynnerton North cutting and Hatton embankment will result in the permanent loss of approximately 1.3ha (8%) of ancient woodland at Clifford's Wood (see Figures EC-26-605, EC-26-605-R1). As a rare and irreplaceable resource, the extent of ancient woodland is important to the structure and function of the LWS. As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.
- 6.7.6 In addition to the area of Clifford's Wood that is ancient woodland, approximately 1.1ha of lowland mixed deciduous woodland, and approximately 2.5ha of mixed plantation woodland will be lost as a result of the construction of the Swynnerton North cutting and Hatton embankment. The loss of lowland deciduous woodland habitat of principal importance, and the buffering effect of the semi-natural and plantation wooded areas of Clifford's Wood on the areas that are ancient woodland/LWS, will result in a permanent adverse effect that will be significant at the county level.

Compensatory measures

- 6.7.7 Table 10 provides a summary of the compensatory measures that are proposed in response to the expected effects on Clifford's Wood.

Table 10: Ancient woodland strategy summary for Clifford's Wood

Woodland	Clifford's Wood	
CA	3	
Status	Ancient semi-natural woodland listed on the AWI and LWS	
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 ancient woodland impacted by significant indirect effects during either construction or operation (ha)		0
Area of receptor site for ancient woodland soils (ha)		1.3
Area of new planting to be provided in response to the loss of ancient woodland (including ancient woodland soil receptor area) (ha)		13.6
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

- 6.7.8 Soils and associated seed bank from the affected 1.3ha of ancient woodland will be translocated to an area of woodland creation to the north-west of Clifford's Wood (see Figures EC-26-605, EC-26-605-R1).
- 6.7.9 The proposed receptor site is approximately 150m to the north-west of the affected area of ancient woodland. This receptor site is contiguous with an area of grassland habitat creation and the retained blocks of mixed semi-natural woodlands to the west of Clifford's Wood. This woodland creation will provide improved connectivity between the semi-natural habitats in this location.

Soil conditions

- 6.7.10 The soil conditions at the donor area of ancient woodland and the receptor area for the translocated soils are classified as 'freely draining slightly acid sandy soils'.

Woodland planting

- 6.7.11 Approximately 3.3ha of native broadleaved woodland will be provided directly adjacent to the retained ancient woodland at Clifford's Wood. Approximately 2.5ha of native broadleaved woodland will be provided contiguous with retained blocks of planting west of Clifford's Wood and approximately 7.8ha of native broadleaved woodland will be provided at the eastern extent of Clifford's Wood, providing new habitat connectivity to The Stretters woodland to the east (see Figures EC-26-605, EC-26-605-R1). This will partially compensate for the loss of approximately 1.3ha (8%) of ancient woodland and the fragmentation of the remaining woodland at Clifford's Wood.
- 6.7.12 This woodland planting has been designed to provide improved connectivity between the retained areas of Clifford's Wood and non-ancient woodland, such as The Stretters, within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.8 Whitmore Wood (CA4)

Baseline conditions

- 6.8.1 Whitmore Wood covers an area of approximately 18.9ha to the north-west of Whitmore Heath and west of the West Coast Main Line (WCML) located wholly within the land required for the Proposed Scheme. The woodland is listed on the AWI as both semi-natural and PAWS. The ancient woodland forms part of the site's designation as Whitmore Wood LWS. The woodland sits within a wider agricultural landscape of large pasture and arable fields, with an established network of hedgerows and woodlands.

- 6.8.2 The canopy of the semi-natural broadleaved part of Whitmore Wood is dominated by downy birch *Betula pubescens* with occasional rowan *Sorbus aucuparia* and hazel. The middle and the south-west corner sections of the woodland are dominated by coniferous plantations, such as larch and western red cedar. Eleven vascular plant species indicative of ancient woodland were recorded. This habitat resembles the NVC for W9a *Fraxinus excelsior*- *Sorbus aucuparia*- *Mercurialis perennis* woodland typical sub-community. There is a more diverse ground flora along rides and tracksides. A stream passing through the woodland supports wet woodland vegetation. The part of the woodland that is semi-natural qualifies as lowland mixed deciduous woodland, a habitat of principal importance and conservation priority of the Staffordshire Biodiversity Action Plan (local BAP).

Valuation

- 6.8.3 Whitmore Wood, is listed on the AWI as both semi natural and PAWS, the wood is also partially designated as LWS. It is considered to be of county value.

Measures taken to avoid or reduce impacts

- 6.8.4 The provision of a retaining wall along the north-east of Whitmore north cutting has been included as part of the design of the Proposed Scheme. This has reduced the area of land within Whitmore Wood required for the Proposed Scheme, and thus has reduced losses of ancient woodland habitat.

Impacts and associated effects

- 6.8.5 The main ES reported that the construction of Whitmore cutting, Whitmore Wood retaining wall and Whitmore Wood overbridge would result in the permanent loss of approximately 6ha (34%) of ancient woodland at Whitmore Wood. Following the deposit of the Bill, the need for further changes to the original proposals were identified. This included additional land and changes to Bill powers for changes to vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002)²⁸. The removal of Whitmore Wood overbridge and the reduction in track separation distance in the AP2 revised scheme, will reduce the permanent loss of ancient woodland from Whitmore Wood to 5.5ha (30.1%) (see Figures EC-26-606, EC-26-606-R1). This includes approximately 1ha of semi-natural broadleaved ancient woodland and approximately 4.5ha of PAWS. The permanent loss of approximately 5.5ha of ancient woodland at Whitmore Wood will have an adverse effect on the structure and function of the LWS. As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

²⁸ HS2 Phase 2a Additional Provision ES2 Supplementary ES2 Volume 2: Community Area report. CA4: Whitmore Heath to Madeley.

Accessed at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775954/J13_HS2_Phase_2a_AP2_ES_Volume_2_CA4_Whitmore_Heath_to_Madeley.pdf

- 6.8.6 The main ES reported that 12.9ha of Whitmore Wood within the land required for the Proposed Scheme would be subject to enhancement. The AP2 revised scheme will result in an additional 0.5ha of Whitmore Wood being subject to enhancement. In total 13.4ha of Whitmore Wood is included within the land required for the Proposed Scheme for the purposes of woodland enhancement.

Compensatory measures

- 6.8.7 Table 11 provides a summary of the compensatory measures that are proposed in response to the expected effects on Whitmore Wood.

Table 11: Ancient woodland strategy summary for Whitmore Wood

Woodland	Whitmore Wood	
CA	4	
Status	Ancient semi-natural woodland listed on the AWI, PAWS and LWS	
Description		Extent of habitat in category (ha)
Area of direct loss of ancient woodland (ha)		5.5
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 ancient woodland impacted by significant indirect effects during either construction or operation (ha)		0
Area of receptor site for ancient woodland soils (ha)		5.5
Area of new planting to be provided in response to the loss of ancient woodland (including ancient woodland soil receptor area) (ha)		36 (combined area of planting in response to losses at three ancient woodland sites in CA4)
Area of enhancement of existing ancient woodland (ha)		13.4
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland		0

Translocation of ancient woodland soils

- 6.8.8 Soils and associated seed bank from the affected 6.0ha of ancient woodland will be translocated to a series of 11 areas of woodland creation contiguous with the retained sections of Whitmore Wood and Hey Sprink (see Figures EC-26-606, EC-26-606-R1). All of the receptor areas fall within 700m of the area of woodland lost at Whitmore Wood.

Soil conditions

- 6.8.9 The soil conditions at the donor area of ancient woodland are classified as 'slightly acid loamy and clayey soils with impeded drainage', the receptor areas fall within areas with soil conditions classified as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils' and 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.8.10 Approximately 36ha of native woodland planting east of Whitmore south cutting and Whitmore north cutting will be provided linking the retained area of Whitmore Wood to Hey Sprink (see Figures EC-26-606, EC-26-606-R1). This will partially compensate for the loss of approximately 5.5ha (30.1%) of ancient woodland at Whitmore Wood and the loss of ancient woodland at Hey Sprink (wood south-west of) and the unnamed wood south of Hey Sprink.
- 6.8.11 The woodland planting has been designed to connect the retained eastern section of Whitmore Wood with semi-natural habitats at Whitmore Heath. Woodland planting will also connect to the woodland fragments between Whitmore Wood and Hey Sprink, forming continuous belts of woodland habitat between the two ancient woodland sites and blocks of non-ancient woodland within the landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

Woodland enhancement

- 6.8.12 An area of 13.4ha of existing woodland at Whitmore Wood will be subject to woodland management and enhancement to partially compensate for the woodland loss at Whitmore Wood.
- 6.8.13 The management and enhancement will include measures such as the removal of invasive plant species, and management of deadwood habitat and trees for the benefit of biodiversity.

6.9 Hey Sprink (wood south-west of) (CA4)

Baseline conditions

- 6.9.1 Hey Sprink (wood south-west of) covers an area of approximately 3.2ha, of which 2.6ha is designated as a LWS. The woodland is partially located within the land required for the Proposed Scheme. Hey Sprink (wood south-west of) mainly comprises of broadleaved semi-natural woodland with species including oak, alder *Alnus glutinosa*, goat willow *Salix caprea* and holly. The woodland sits within an agricultural landscape of large pasture and arable fields with a network of managed hedgerows that link Hey Sprink (wood south-west of) to the large ancient woodlands at Hey Sprink to the north and Whitmore Wood to the south, the WCML is located to the west.

Valuation

- 6.9.2 On the basis of the heritage review undertaken by HS2 Ltd, Hey Sprink (wood south-west of) has been added to the AWI. This ancient woodland is of county value.

Impacts and associated effects

- 6.9.3 The main ES reported that the construction of Lea south embankment would result in the permanent loss of approximately 0.2ha (7%) of ancient woodland at Hey Sprink (wood south-west of). Following the deposit of the Bill, the need for further changes to the original proposals were identified. This included additional land and changes to Bill powers for changes to vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002)²⁹. The horizontal alignment changes at Lea South embankment in the AP2 revised scheme, will reduce the permanent loss of ancient woodland from Hey Sprink (wood south-west of) to 0.1ha (4%) (see Figure EC-26-606). As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.9.4 Table 12 provides a summary of the compensatory measures that are proposed in response to the expected effects on Hey Sprink (wood south-west of).

²⁹ HS2 Phase 2a Additional Provision ES2 Supplementary ES2 Volume 2: Community Area report. CA4: Whitmore Heath to Madeley. Accessed at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775954/J13_HS2_Phase_2a_AP2_ES_Volume_2_CA4_Whitmore_Heath_to_Madeley.pdf

Table 12: Ancient woodland strategy summary for Hey Sprink (wood south-west of)

Woodland	Hey Sprink (wood south-west of)	
CA	4	
Status	Ancient semi-natural woodland listed on the AWI	
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 ancient woodland impacted by significant indirect effects 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 (including ancient woodland soil receptor area) (ha)		36 (combined area of planting in response to losses at three ancient woodland sites in CA4)
Area of enhancement of existing ancient woodland (ha)		0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland		0

Translocation of ancient woodland soils

- 6.9.5 Soils and associated seed bank from the affected 0.1ha of ancient woodland will be translocated to an area of woodland habitat creation immediately to the east of Hey Sprink (wood south-west of) (see Figure EC-26-606). The receptor site is located approximately 220m to the east of the woodland loss at Hey Sprink (wood south-west of).

Soil conditions

- 6.9.6 The soil conditions at the donor area of ancient woodland and the receptor areas are classified as 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.9.7 Approximately 36ha of native woodland planting east of Whitmore south cutting and Whitmore north cutting will be provided linking the retained area of Whitmore Wood to Hey Sprink (see Figures EC-26-606, EC-26-606-R1). This will partially compensate for the loss of approximately 0.2ha (6%) of ancient woodland at Hey Sprink (wood south-west of) and the loss of ancient woodland at Whitmore Wood and the unnamed wood south of Hey Sprink.
- 6.9.8 The woodland planting has been designed to connect the retained eastern section of Whitmore Wood with semi-natural habitats at Whitmore Heath. Woodland planting will also connect to the woodland fragments between Whitmore Wood and Hey Sprink, forming continuous belts of woodland habitat between the two ancient woodland sites and blocks of non-ancient woodland within the landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.10 Unnamed wood south of Hey Sprink (CA4)

Baseline conditions

- 6.10.1 An unnamed wood is located south of Hey Sprink and covers an area of approximately 0.9ha. The woodland is partially located within the land required for the Proposed Scheme. The unnamed wood south of Hey Sprink comprises broadleaved semi-natural woodland with species including oak, alder, goat willow and holly. The woodland sits within an agricultural landscape of large pasture and arable fields with a network of managed hedgerows that link to Hey Sprink (wood south-west of) and to the large ancient woodlands at Hey Sprink to the north and Whitmore Wood to the south, the WCML is located to the west.

Valuation

- 6.10.2 On the basis of the heritage review undertaken by HS2 Ltd, the unnamed wood south of Hey Sprink has been added to the AWI. This ancient woodland is of county value.

Impacts and associated effects

- 6.10.3 Construction of Lea South embankment will result in the permanent loss of approximately 0.2ha (22%) of ancient woodland at the unnamed wood south of Hey Sprink (see Figure EC-26-606). As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.10.4 Table 13 provides a summary of the compensatory measures that are proposed in response to the expected effects on unnamed wood south of Hey Sprink.

Table 13: Ancient woodland strategy summary for Unnamed wood south of Hey Sprink

Woodland	Unnamed wood south of Hey Sprink	
CA	4	
Status	Ancient semi-natural woodland listed on the AWI	
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
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)		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 (including ancient woodland soil receptor area) (ha)		36 (combined area of planting in response to losses at three ancient woodland sites in CA4)
Area of enhancement of existing ancient woodland (ha)		0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland		0

Translocation of ancient woodland soils

- 6.10.5 Soils and associated seed bank from the affected 0.2ha of ancient woodland will be translocated to an area of woodland habitat creation immediately to the north of the unnamed woodland south of Hey Sprink (see Figure EC-26-606). The receptor site is located approximately 350m to the east of the site of woodland loss at unnamed wood south of Hey Sprink.

Soil conditions

- 6.10.6 The soil conditions at the donor area of ancient woodland and the receptor areas are classified as 'slightly acid loamy and clayey soils with impeded drainage'.

Woodland planting

- 6.10.7 Approximately 36ha of native woodland will be provided east of Whitmore south cutting and Whitmore north cutting linking the retained area of Whitmore Wood to Hey Sprink (see Figures EC-26-606, EC-26-606-R1). This will partially compensate for the loss of approximately 0.2ha (22%) of ancient woodland at the unnamed wood south of Hey Sprink and the loss of ancient woodland at Whitmore Wood and Hey Sprink (wood south-west of).
- 6.10.8 The woodland planting has been designed to connect the retained eastern section of Whitmore Wood with semi-natural habitats at Whitmore Heath. Woodland planting will also connect to the woodland fragments between Whitmore Wood and Hey Sprink, forming continuous belts of woodland habitat between the two ancient woodland sites and blocks of non-ancient woodland within the landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.11 Barhill Wood (CA4)

Baseline conditions

- 6.11.1 Barhill Wood covers an area of approximately 5ha to the west of Madeley and north of the A525, located partially within the land required for the Proposed Scheme. Barhill Wood is listed on the AWI as semi-natural broadleaved woodland and comprises a canopy co-dominated by sycamore and pedunculate oak. Rowan and sycamore dominate the understory with occasional elder. Five vascular plant species that are indicative of ancient woodland were recorded. The species composition of this habitat is characteristic of NVC W8e *Fraxinus excelsior*- *Acer campestre*-*Mercurialis perennis* woodland *Geranium robertianum* sub-community. Barhill Wood sits within an agricultural landscape to the south-west of Madeley with large arable and pasture fields and managed hedgerows linking Barhill Wood to the ancient woodland at Wrinehill Wood, Wrinehill Wood (east of), Beech Wood and Grafton's Wood to the north-west.

Valuation

- 6.11.2 Barhill Wood is listed on the AWI and is considered to be of county value.

Impacts and associated effects

- 6.11.3 Construction of Madeley cutting will result in the permanent loss of approximately 0.2ha (3%) of ancient woodland at Barhill Wood (see Figure EC-26-607). As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.11.4 Table 14 provides a summary of the compensatory measures that are proposed in response to the expected effects on Barhill Wood.

Table 14: Ancient woodland strategy summary for Barhill Wood

Woodland	Barhill Wood	
CA	4	
Status	Ancient semi-natural woodland listed on the AWI	
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
Area of ancient woodland impacted by significant indirect effects during either construction or operation (ha)		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 (including ancient woodland soil receptor area) (ha)		3.9
Area of enhancement of existing ancient woodland (ha)		0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland		0

Translocation of ancient woodland soils

- 6.11.5 Soils and associated seed bank from the affected 0.2ha of ancient woodland will be translocated to an area of woodland habitat creation immediately adjacent to the south of Barhill Wood (see Figure EC-26-607). The soil receptor area is approximately 350m south of the area of woodland loss at Barhill Wood.

Soil conditions

- 6.11.6 The soil conditions at the donor area of ancient woodland and the receptor area are classified as 'freely draining slightly acid sandy soils'.

Woodland planting

- 6.11.7 Approximately 3.9ha of native broadleaved woodland will be provided to the south-west of Madeley cutting, directly adjacent to Barhill Wood (see Figure EC-26-607), which will partially compensate for the loss of approximately 0.2ha (3%) of ancient woodland at Barhill Wood.
- 6.11.8 The woodland planting has been designed to buffer the structure and function of the retained areas of Barhill Wood and improve connectivity between the retained ancient woodland and non-ancient woodland, such as the blocks of woodland to the south of Barhill Wood, and other semi-

natural habitats within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient and non-ancient woodland into these associated habitats.

6.12 Wrinehill Wood (east of) (CA4)

Baseline conditions

- 6.12.1 Wrinehill Wood (east of) covers an area of approximately 3.6ha to the west of Madeley, located partially within the land required for the Proposed Scheme. The woodland is partially designated as a Biodiversity Alert Site (BAS) and includes a small easterly extension within Wrinehill Wood, east of Wrinehill Wood and south of Checkley Brook. The woodland mainly comprises of broadleaved semi-natural woodland dominated by alder, silver birch, rowan and oak. It consists of a series of narrow, scattered woodland remnants. Wrinehill Wood (east of) sits within an agricultural landscape west of Madeley with large arable and pasture fields and managed hedgerows that link to the nearby ancient woodlands at Wrinehill Wood, Beech Wood, Grafton's Wood and Barhill Wood.

Valuation

- 6.12.2 On the basis of the heritage review undertaken by HS2 Ltd, Wrinehill Wood (east of) has been added to the AWI and is of county value.

Impacts and associated effects

- 6.12.3 Construction of the Madeley tunnel and Checkley South embankment will result in the permanent loss of approximately 0.1ha (3%) of ancient woodland at Wrinehill Wood (east of) (see Figure EC-26-608). As ancient woodland cannot be recreated the permanent loss would remain an adverse effect that is significant at county level.

Compensatory measures

- 6.12.4 Table 15 provides a summary of the compensatory measures that are proposed in response to the expected effects on Wrinehill Wood (east of).

Table 15: Ancient woodland strategy summary for Wrinehill Wood (east of)

Woodland	Wrinehill Wood (east of)	
CA	4	
Status	Ancient semi-natural woodland listed on the AWI	
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 ancient woodland impacted by significant indirect effects 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 (including ancient woodland soil receptor area) (ha)		5.2
Area of enhancement of existing ancient woodland (ha)		0
Area where HS2 Ltd will undertake enhancement of existing non-ancient woodland		0

Translocation of ancient woodland soils

- 6.12.5 Soils and associated seed bank from the affected 0.4ha of ancient woodland will be translocated to an area of woodland habitat creation immediately adjacent to a retained portion of Wrinehill Wood (east of) (see Figure EC-26-608). The soil receptor area is approximately 100m south of the woodland loss at Wrinehill Wood (east of).

Soil conditions

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

Woodland planting

- 6.12.7 Approximately 5.2ha of native broadleaved woodland will be provided to the south of the Madeley tunnel northern porous portal (see Figure EC-26-608), which will partially compensate for the loss of approximately 0.1ha (2.8%) of ancient woodland at Wrinehill Wood (east of).
- 6.12.8 The woodland planting has been designed to buffer the structure and function of the retained areas of Wrinehill Wood (east of) and improve connectivity between the remnant blocks of Wrinehill Wood (east) to the larger area of ancient woodland at Wrinehill Wood, and other semi-

natural habitats within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient woodland into these associated habitats.

7 Conclusions and route-wide summary

- 7.1.1 The 9.8ha total area of ancient woodland loss as a result of the Proposed Scheme will consist of 5.3ha of ancient semi-natural woodland and 4.5ha of PAWS. The largest scale loss from any single ancient woodland will be 5.5ha from Whitmore Wood (CA4), which consists of approximately 1ha of ancient semi-natural woodland and 4.5ha PAWS.
- 7.1.2 Of the 11 ancient woodlands where direct impacts will occur, the loss or damage of ancient woodland at eight of these sites will be less than 1ha. This includes seven ancient woodlands where the area of ancient woodland lost or damaged will be less than 0.5ha (see Table 4).
- 7.1.3 No additional ancient woodlands (beyond the 11 directly affected) are expected to be subject to significant adverse effects.
- 7.1.4 All updated figures are based on the assumptions detailed in this document, and estimates are made in advance of the detailed design of the Proposed Scheme.

7.2 Compensation in response to effects on ancient woodland

- 7.2.1 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 proposed in response to effects on ancient woodland habitat is as follows (see Section 6 for further detail):
- 9.6ha of ancient woodland soils³⁰ to be translocated to receptor sites;
 - 78ha of new woodland planting (including the areas identified as receptor sites for ancient woodland soils); and
 - 13.4ha of enhancement of ancient woodland.
- 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 Proposed Scheme and are in line with current relevant standing advice.
- 7.2.4 The primary purpose of the 78ha of new woodland planting detailed above is to compensate for the loss of ancient woodland. However, this new woodland planting is also designed to provide connectivity between retained areas of non-ancient woodland and other associated semi-natural

³⁰ These areas are expected to be planted following soil translocation.

habitats within the local landscape. This connectivity will facilitate the dispersal of species from the retained areas of ancient woodland into these associated habitats.

- 7.2.5 Additional areas of woodland mitigation and compensation planting not identified in this report are compensation for non-ancient woodland only and will be considered within HS2 Ltd's no net loss calculation for replaceable habitats.

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 Proposed Scheme will continue to make efforts to reduce the area of ancient woodland that will be lost as a consequence of the Proposed Scheme.
- 7.3.2 In accordance with the measures detailed in the draft CoCP and the EMRs, during detailed design and construction, efforts will continue to be made to seek to avoid or further reduce the impacts of the Proposed Scheme on ancient woodland. 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, the 9.8ha 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 areas where it has not yet been possible to undertake 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 habitat 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.

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Appendix 1: Woodland creation and soil translocation

1.1 Approaches

1.1.1 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.

1.2 Design specifications - general

1.2.1 Woodland creation through 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); and
- Woodland edge structure (including rides and glades).

1.2.2 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.

1.2.3 The Phase 1 contractor(s) should ensure works affecting ancient woodland sites are guided by the Ancient Woodland Strategy.

1.2.4 The Phase 2a contractor(s) should ensure works affecting ancient woodland sites are guided by the Ancient Woodland Strategy.

1.2.5 In accordance with the EMRs, during detailed design and construction, the contractors should use reasonable endeavours to avoid or further reduce impacts on Ancient Woodland. As detailed design is undertaken, further information shall be gathered relating to both the areas of ancient woodland that should be affected, and the proposed receptor sites. Details on the further information requirement can be found in the Habitat Translocation Phase 1 Gap analysis Master Spreadsheet and associated report.

1.2.6 Design specification for translocation of ancient woodland soils and vegetation shall accord with best practice guidance, results of baseline and soil surveys.

1.2.7 Current best practice includes but is not limited to the following; CIRIA C6001 and recognised best practice based on experience at Cossington Fields (A2/M2)².

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

1.3 Information required for detailed design

1.3.1 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.

1.3.2 A National Vegetation Classification (NVC) survey and mapping of the woodland to be lost shall be undertaken, to sub-community level, according to published methods³.

1.3.3 All mapping should be in accordance with the Geographic Information System Standards.

1.3.4 Geospatial data on woodland creation and receptor sites shall be recorded by the designer and passed to HS2 Ltd in accordance with the Geographic Information System Standards.

Information to inform new woodland creation

1.3.5 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.

¹ Penny Anderson, 2003, CIRIA C600, Habitat translocation – a best practice guide. CIRIA. London.

² Cresswell/Hyder 2012 A2/M2 Cobham to Junction 4 Widening Scheme: Ten-year Ecological Monitoring Strategy 2000-2009. Final Monitoring Report

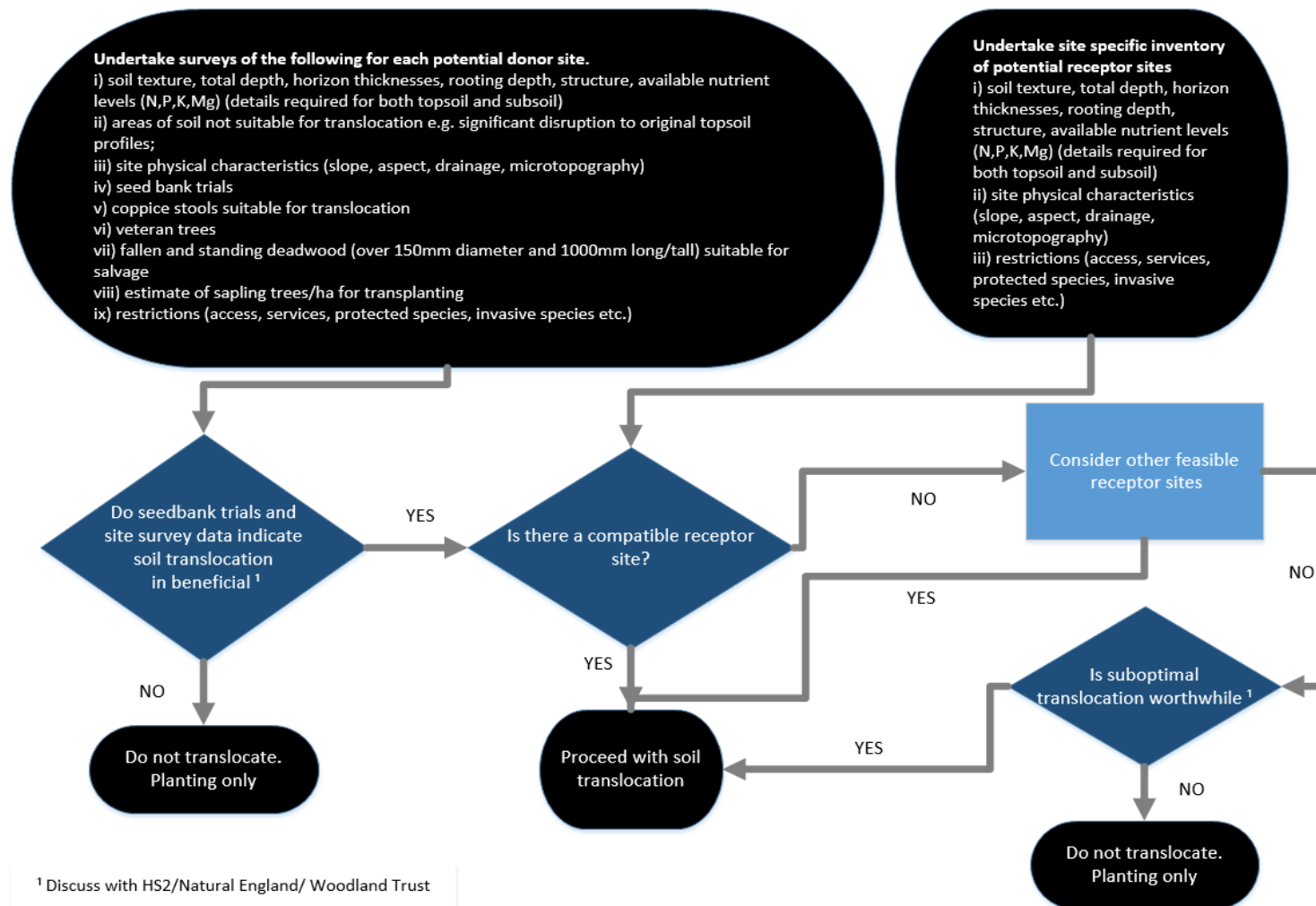
³ Rodwell, J. S. (ed.) (1991) British Plant Communities. Volume 1. . Woodlands and Scrub Cambridge University Press

Information to inform soil translocation

1.3.6 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.
- 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



1.4 Design specification - woodland planting

- 1.4.1 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.
- 1.4.2 Each woodland area should include for 10% to 20% open areas (at maturity) not planted with trees (as rides and glades). Where appropriate the creation of open-grown veteran tree candidates around the peripheries of newly created woodlands should also be considered. Design may vary from this where particular mitigation objectives (landscape, visual or ecological) at each location require variance.

- 1.4.3 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

- 1.4.4 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

- 1.4.5 Woodland planting shall occur in the dormant season.

Establishment phase management

- 1.4.6 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.

Target performance

- 1.4.7 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.
- 1.4.8 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

- 1.4.9 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.

1.5 Design specification – translocation of soils and vegetation

1.5.1 Translocation should be undertaken in late autumn/early winter avoiding frost/snow and heavy rain. Suitable weather conditions are described below.

1.5.2 Low ground pressure vehicles should be used for these works.

Receptor site preparation

1.5.3 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).

1.5.4 The topsoil shall be stripped and removed (to the depth defined by soil surveys), using a non-toothed bucket.

1.5.5 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).

1.5.6 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.

1.5.7 Haul and access routes shall not run on topsoil, but may run on exposed subsoil.

1.5.8 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

1.5.9 Vegetation clearance should be undertaken within one month prior to soil translocation.

1.5.10 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 by the contractor, although HS2 Ltd. does not require data on these areas.

1.5.11 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.

1.5.12 Prior to vegetation clearance, coppice stools, saplings and dead wood (where present) for translocation shall be identified and clearly marked.

1.5.13 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.

1.5.14 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.

1.5.15 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.

1.5.16 Any saplings that are identified for translocation shall be excavated by hand tools prior to woodland soil translocation.

1.5.17 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.

1.5.18 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. Whilst there is no data deliverable to HS2 Ltd., the contractor shall record data and decision-making which would need to be made available as necessary.

1.5.19 Soil-handling operations shall be carried out in accordance with Technical Standard – Soil Handling for Land Restoration.

1.5.20 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).

1.5.21 Haul and access routes shall not run on topsoil, but may run on exposed subsoil.

1.5.22 Haul routes shall be mulched and maintained in a serviceable condition for the traffic movements required.

1.5.23 All machines shall work from the haul route or exposed subsoil. There shall be no tracking over topsoil.

1.5.24 Where there is also a requirement for subsoil to be translocated, this shall be stripped and transported separately from the topsoil.

1.5.25 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.

1.5.26 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).

1.5.27 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

1.5.28 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.

1.5.29 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).

1.5.30 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

1.5.31 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.

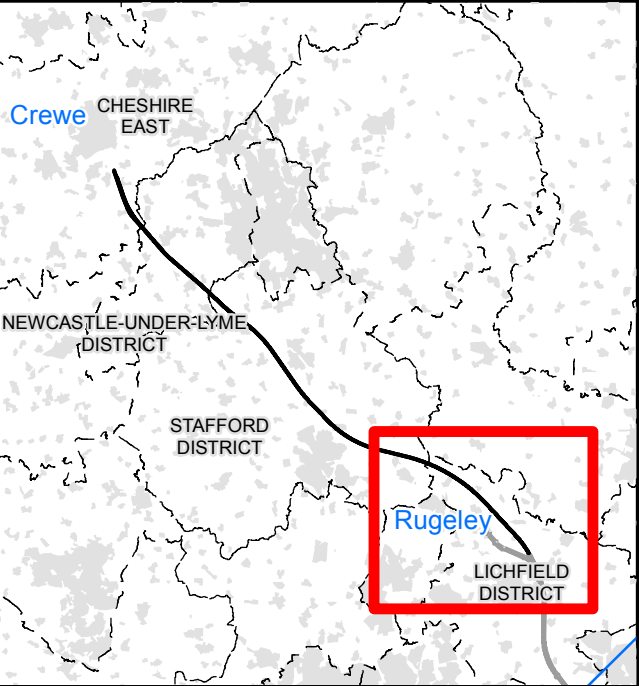
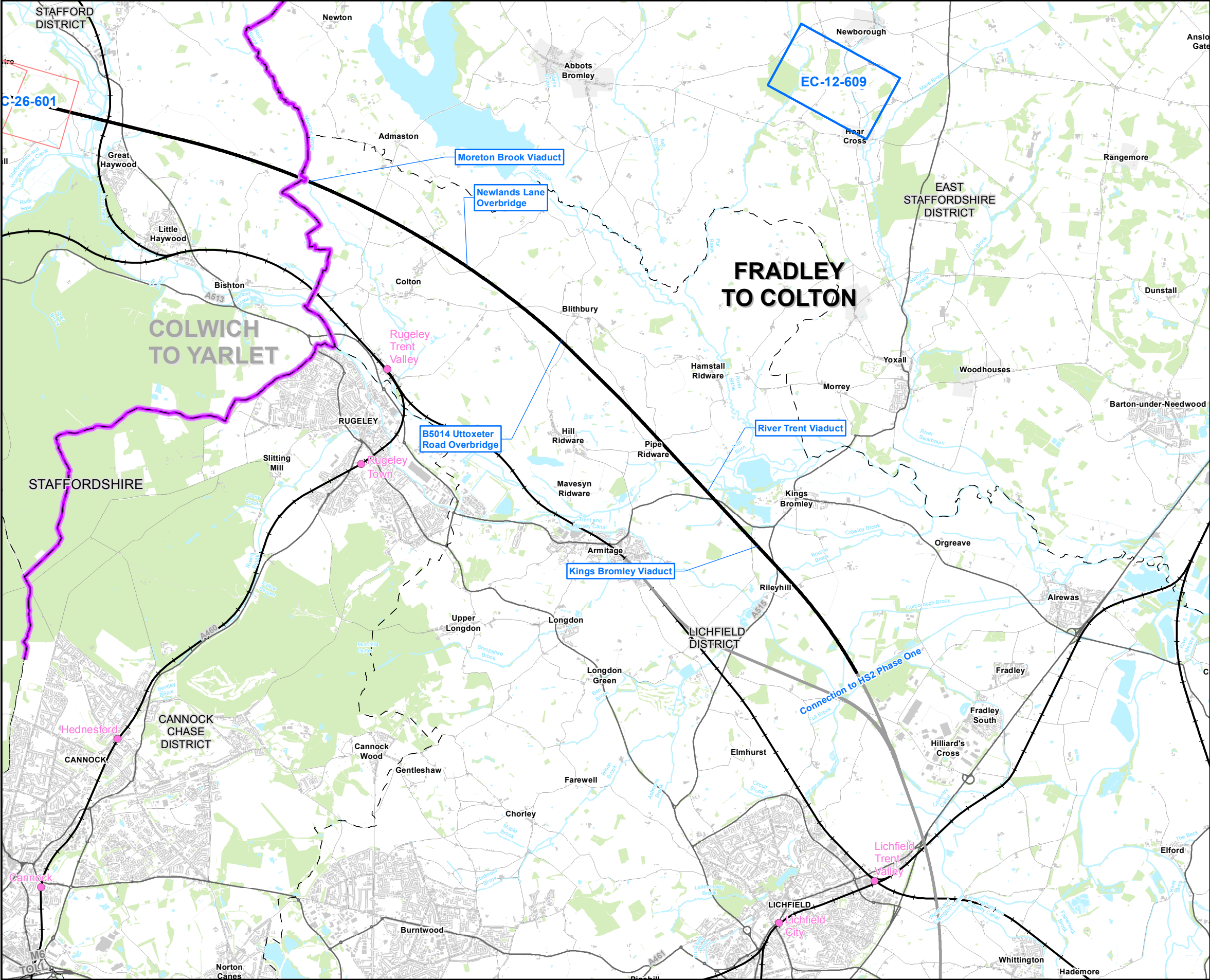
Target performance

1.5.32 Targets should be identified based upon the donor community and in accordance with the target performance identified for woodland planting.

Performance requirements

1.5.33 Soil translocation should be undertaken by specialist contractor.

Appendix 2: Figures

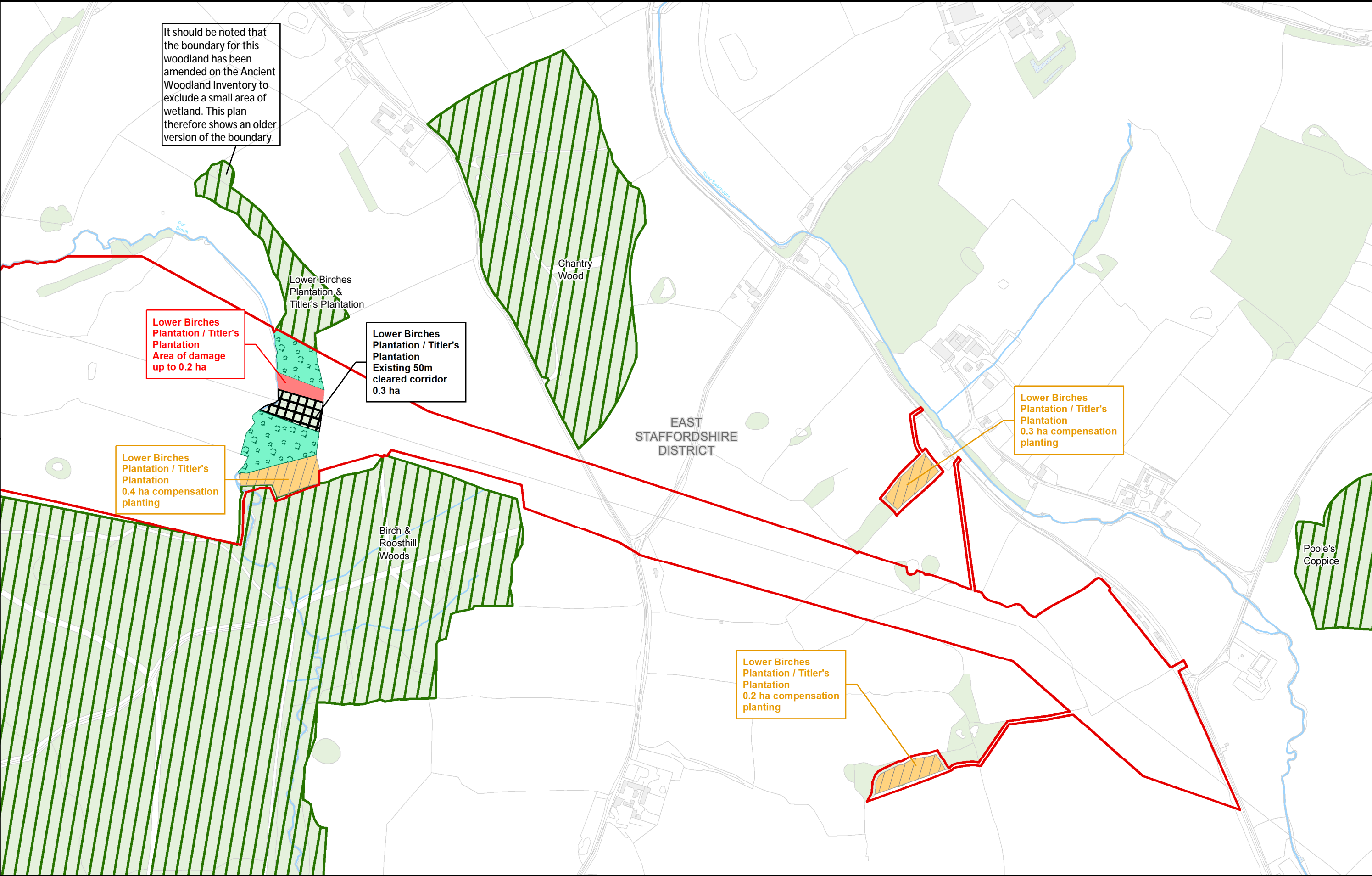


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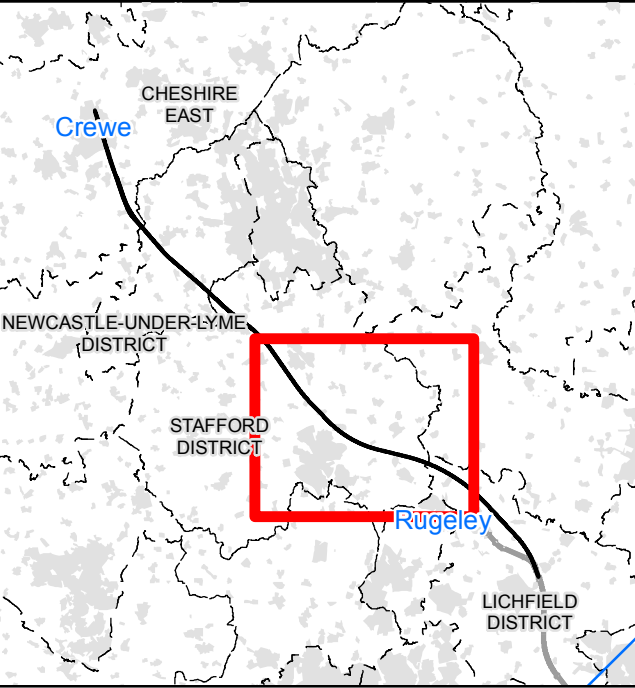
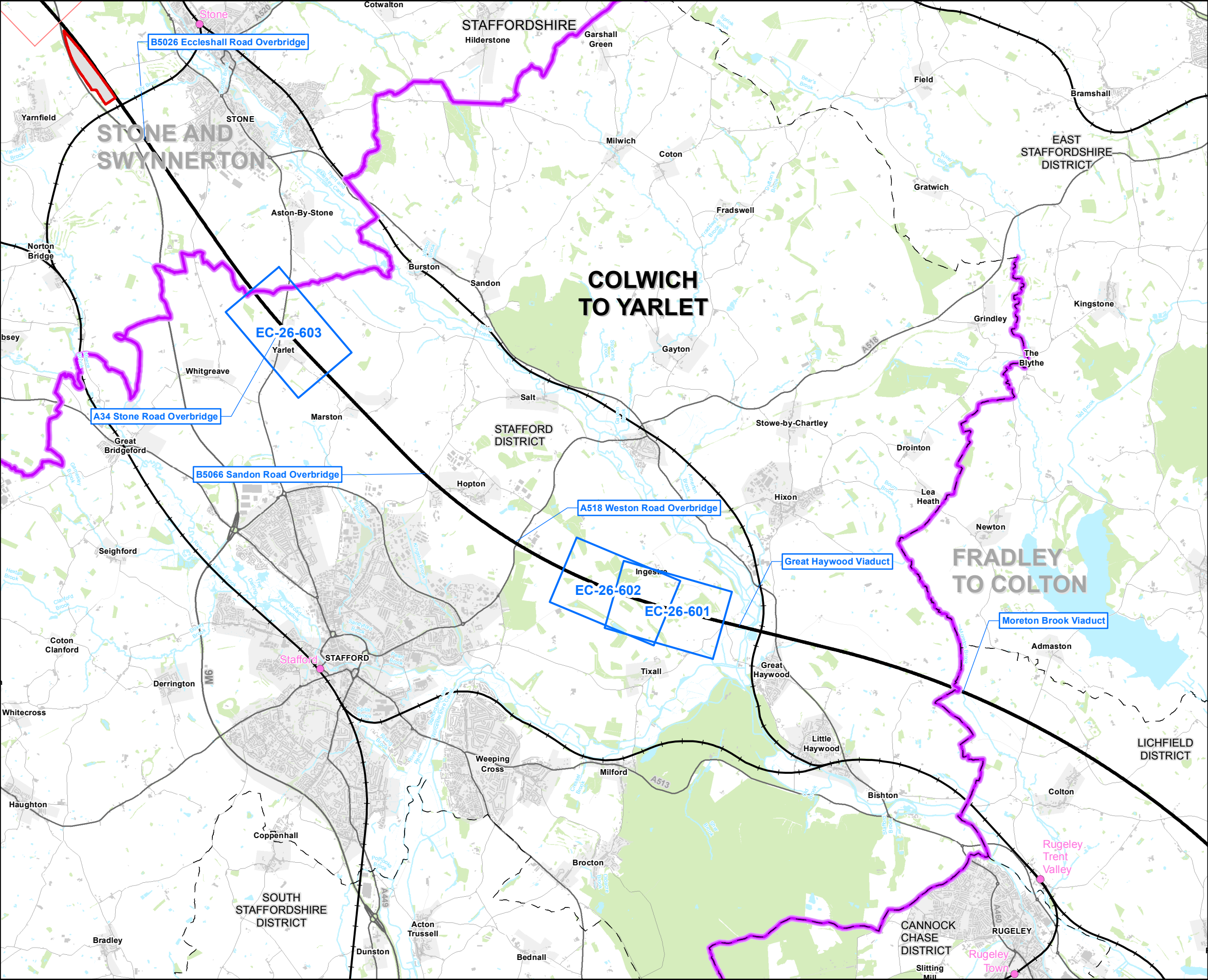
This map series shows ancient woodlands that are located within the land required for the construction of the Proposed Scheme. They also show the areas of woodland lost to construction of the Proposed Scheme, and areas of woodland habitat creation and enhancement that will be undertaken to partially compensate for these losses.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend <ul style="list-style-type: none">Route in bored tunnelRoute on surfaceDepot, station, headhouse or portal buildingCommunity area boundaryExisting railway stationCounty boundaryDistrict/Borough boundary	<ul style="list-style-type: none">Map sheets included in this community areaMap sheets not included in this community area	Map Number EC-26-INDEX-CA1	<p>HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.</p> <p>Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.</p> <p>© Crown copyright and database rights 2017 Ordnance Survey Licence Number 100049190.</p> <p>Scale at A3: 1:70,000</p> <p>0 700 1,400 2,100 2,800 Metres</p> <p>Doc Number: C861-ARP-EV-MAP-000-093001-AP1-P01.1 Date: 21/02/19</p>
Index Map of: Ancient Woodland Strategy		Community Area 1: Fradley to Colton	



Legend		Map Number EC-26-609	
— — Rail alignment	Watercourse	Map Name Ancient Woodland Strategy Lower Birches Plantation & Titler's Plantation	
Grey Rail alignment formation	Water body		
Blue Tunnel portal	Woodland	Community Area 1: Fradley to Colton	
Blue Headhouse	Landscape earthworks		
Purple Community area boundary	Engineering earthworks	© Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190.	
Red Land potentially required during construction	Area of ancient woodland located outside of the hybrid Bill limits that will be retained	Scale at A3: 1:5,000	
	Area of direct loss of ancient woodland (ha)	0 50 100 150 200 Metres	
	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)	Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.	
	Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	Doc Number: C861-ARP-EV-MAP-000-000063-P01	
	Area of existing clearance	Date: 21/02/19	
	Ecological mitigation pond		
	Grassland habitat creation		



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- Main Map Legend**
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 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
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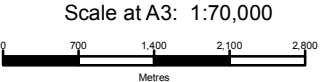
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Map Name	Index Map of: Ancient Woodland Strategy
Community Area 2: Colwich to Yarlet	



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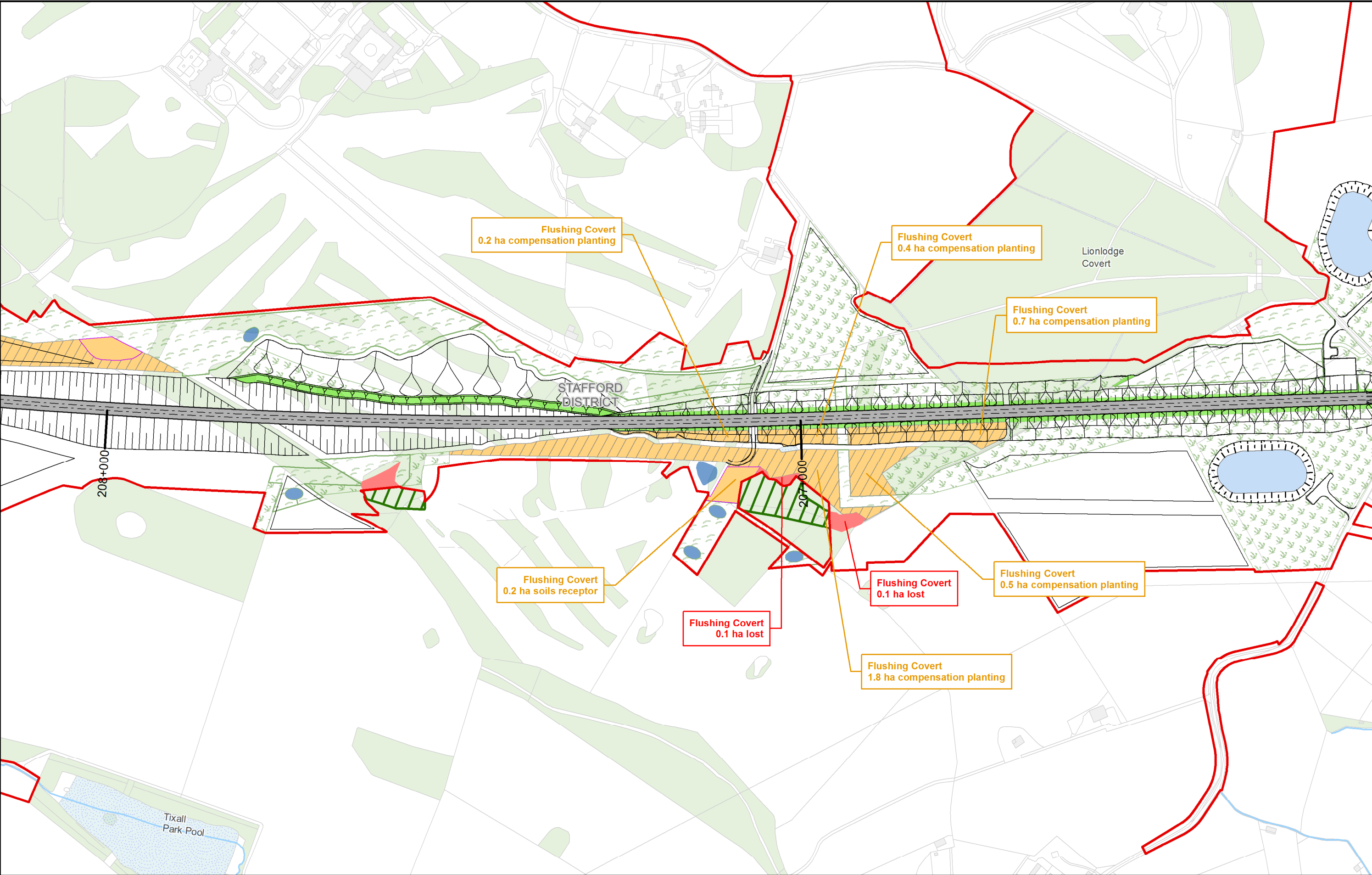
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Legend

- Rail alignment
- Rail alignment formation
- Tunnel portal
- Headhouse
- Community area boundary
- Land potentially required during construction
- Watercourse
- Water body
- Woodland
- Landscape earthworks
- Engineering earthworks

- 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)

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

Map Number EC-26-601

Map Name Ancient Woodland Strategy
Flushing Covert

Community Area 2:
Colwich to Yarlet

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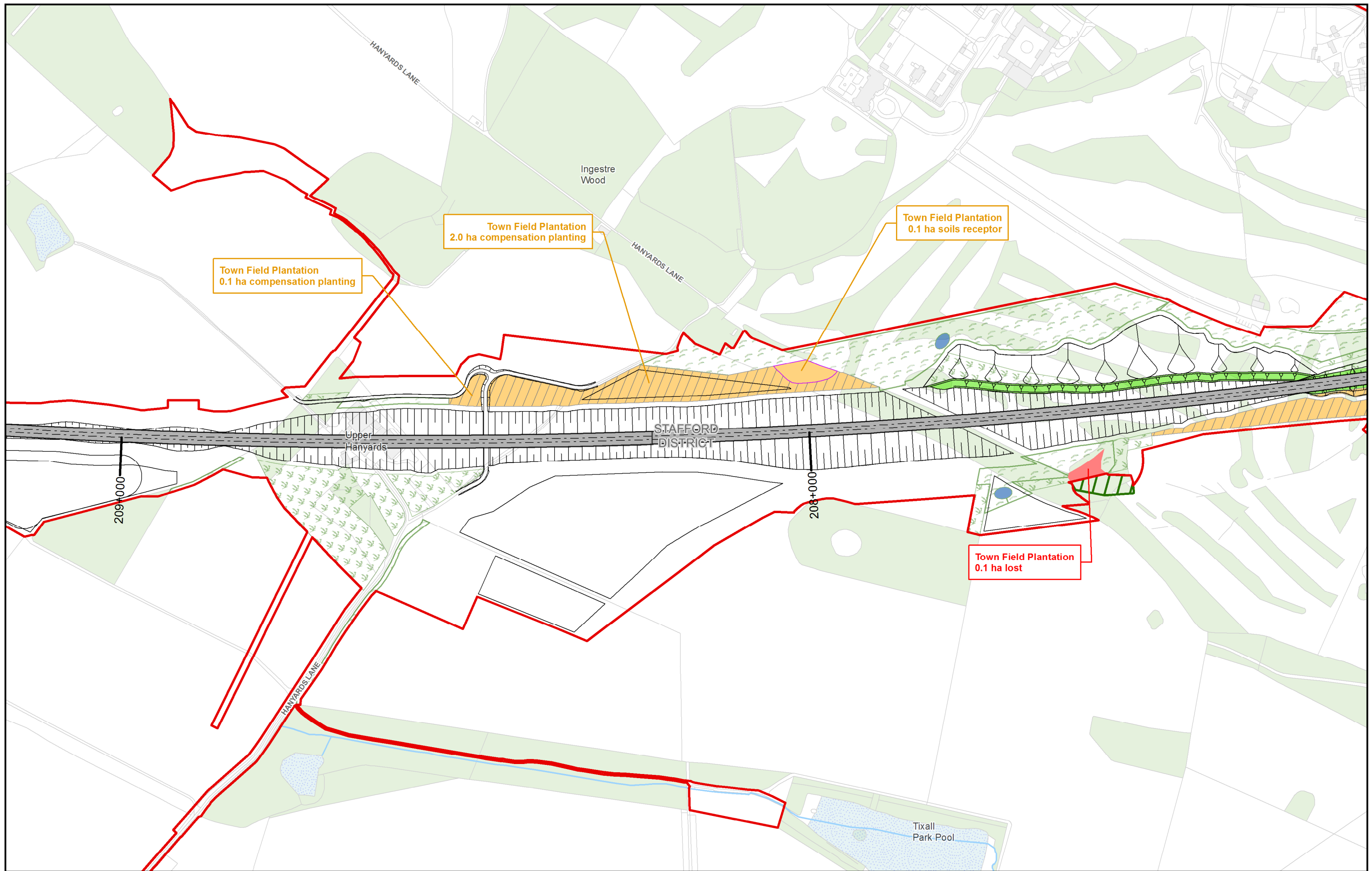
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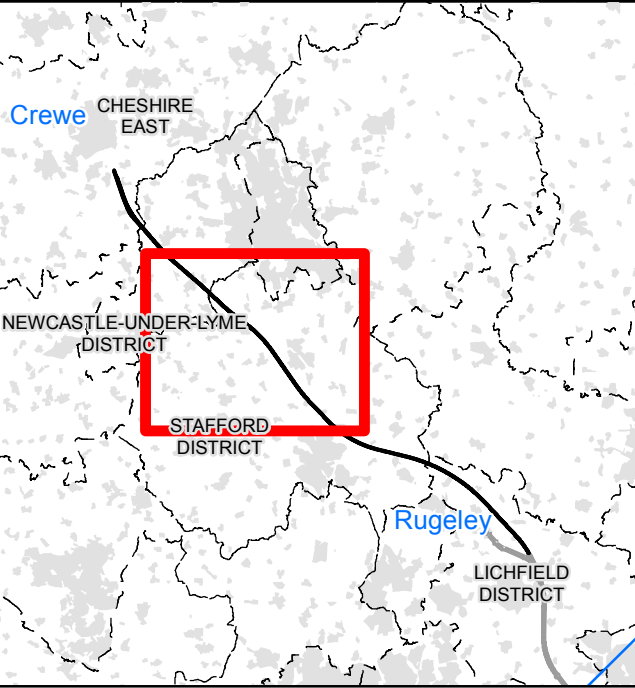
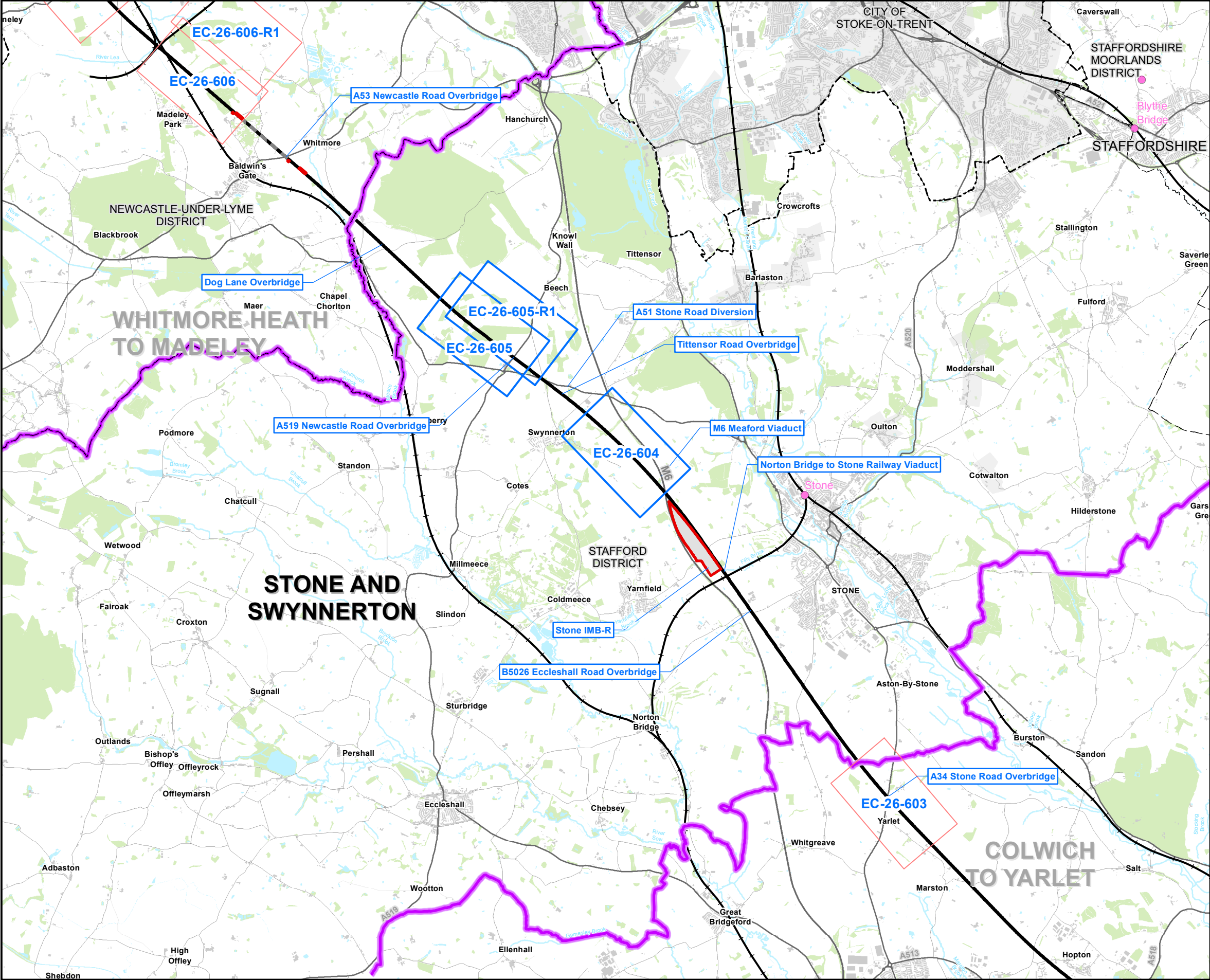
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Legend <ul style="list-style-type: none">--- Rail alignment--- Rail alignment formation--- Tunnel portal--- Headhouse--- Community area boundary--- Land potentially required during construction--- Watercourse--- Water body--- Woodland--- Landscape earthworks--- Engineering earthworks--- 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)--- Ecological mitigation pond--- Grassland habitat creation--- Landscape mitigation planting (scrub/woodland)--- Grassed areas	<table border="1"><tr><td>Map Number</td><td>EC-26-602</td></tr><tr><td>Map Name</td><td>Ancient Woodland Strategy Town Field Plantation</td></tr><tr><td colspan="2">Community Area 2: Colwich to Yarlet</td></tr></table>	Map Number	EC-26-602	Map Name	Ancient Woodland Strategy Town Field Plantation	Community Area 2: Colwich to Yarlet		<div>HS2<p>HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.</p><p>Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.</p><p>© Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190.</p><p>Doc Number: C861-ARP-EV-MAP-000-093602-P04</p><p>Date: 21/02/19</p></div> <div>Scale at A3: 1:5,000</div> <div>0 50 100 150 200 Metres</div>
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Map Name	Ancient Woodland Strategy Town Field Plantation							
Community Area 2: Colwich to Yarlet								



Map Series Information:

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Map Number EC-26-INDEX-CA3

Map Name Index Map of:
Ancient Woodland Strategy

Community Area 3:
Stone and Swynnerton

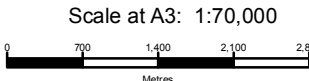


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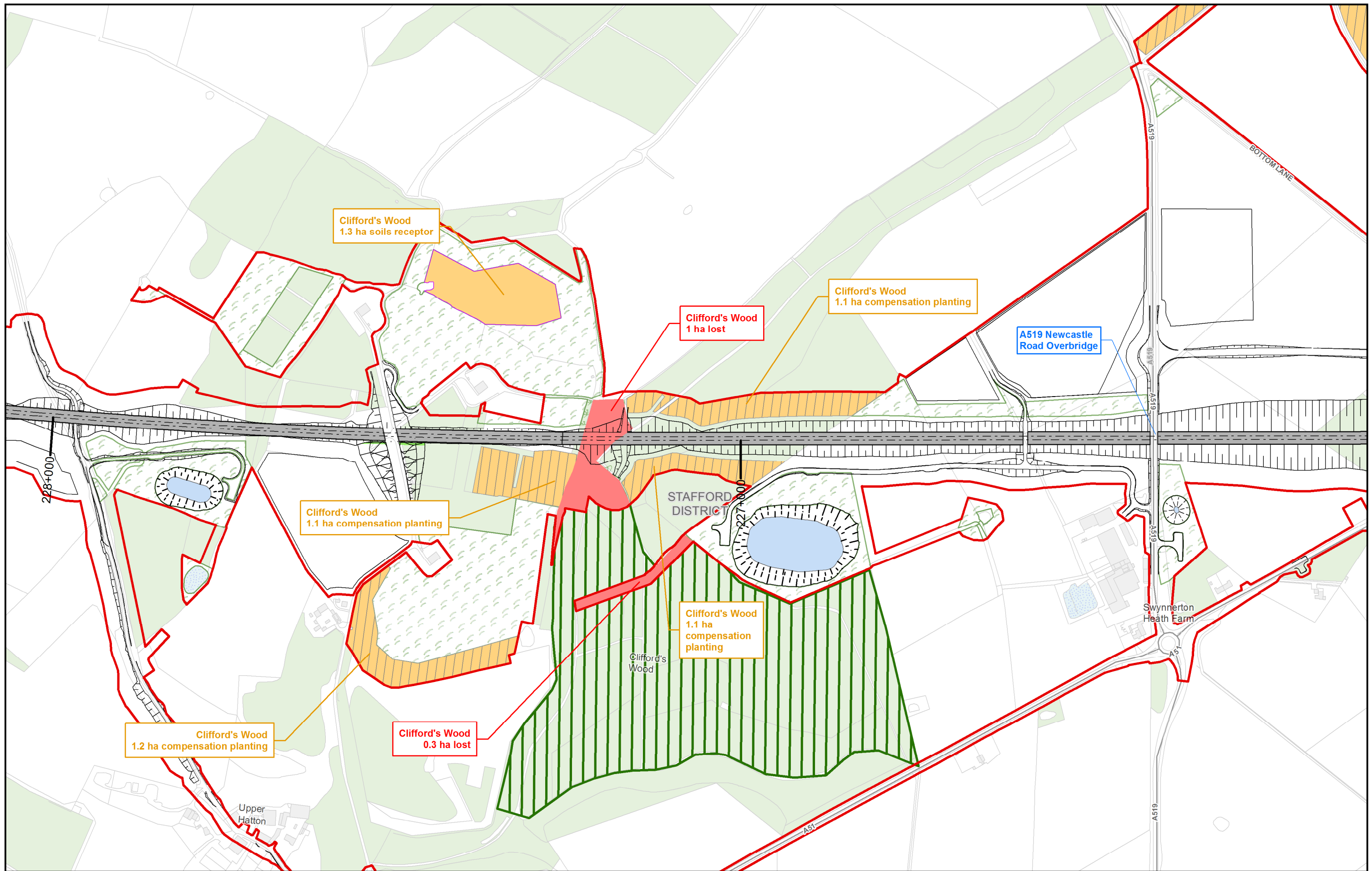
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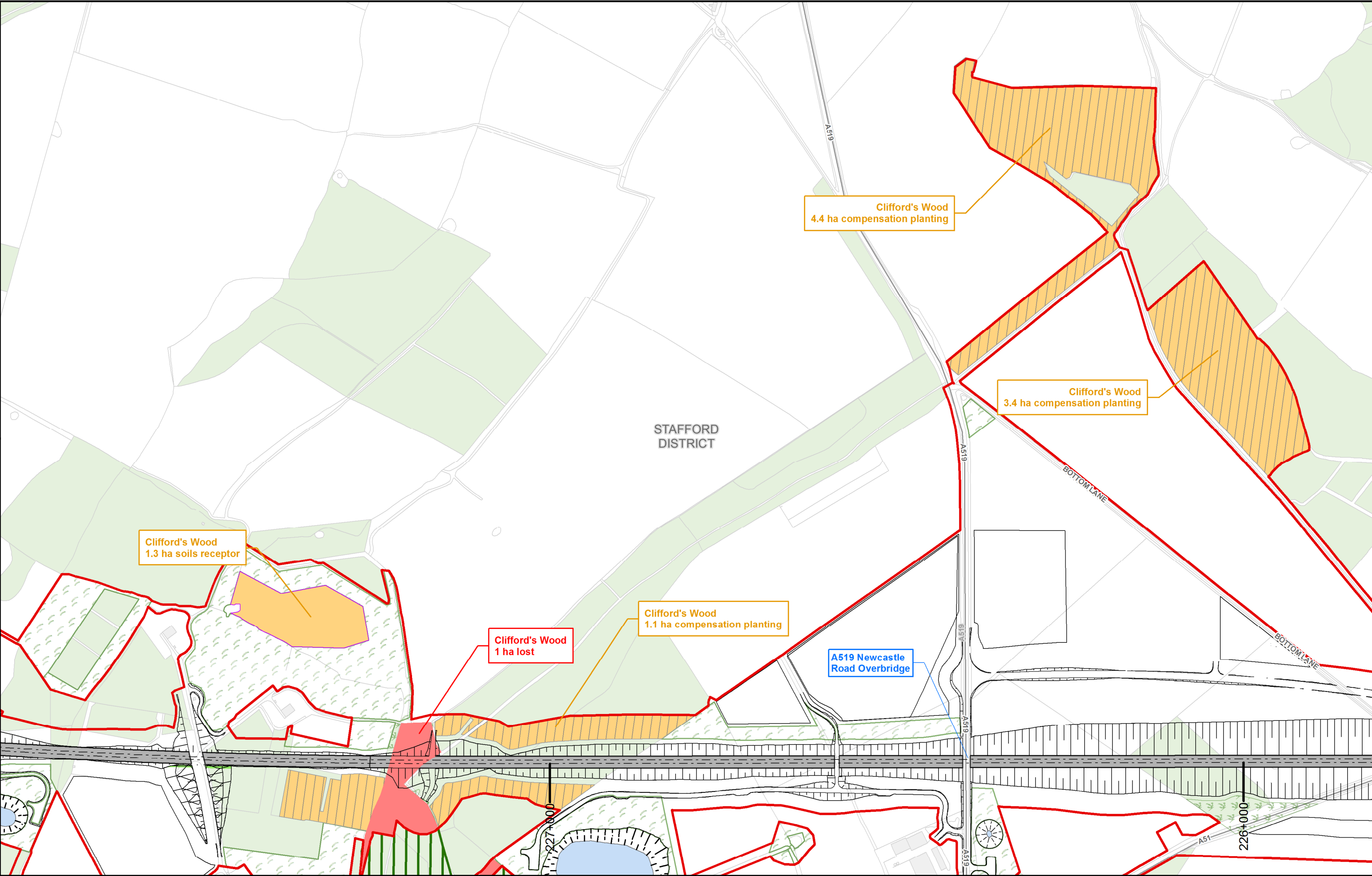


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Date: 21/02/19



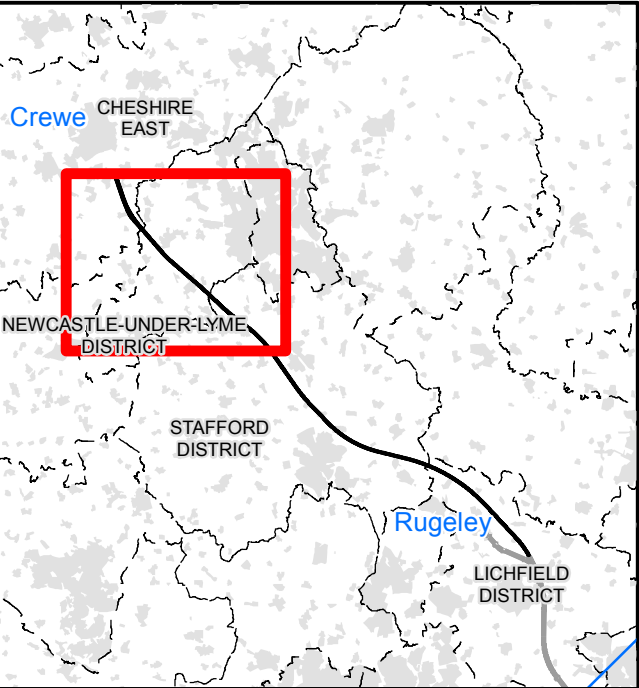
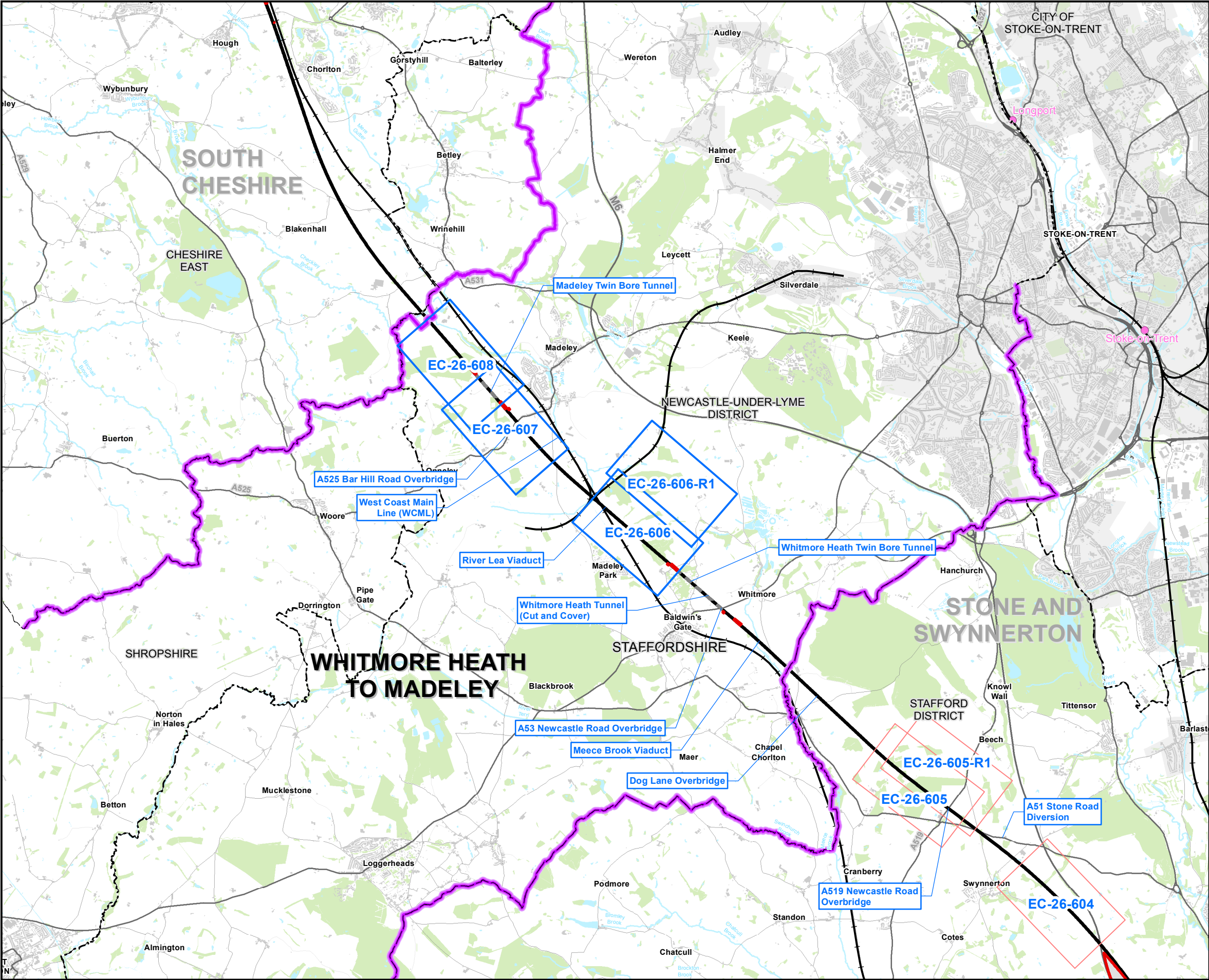
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Blue box Tunnel portal	Woodland	Community Area 3: Stone and Swynnerton	
Blue box Headhouse	Landscape earthworks		
Purple line Community area boundary	Engineering earthworks	HS2 HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way. <small>Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.</small> <small>© Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190.</small> Doc Number: C861-ARP-EV-MAP-000-093605-P04	
Red outline Land potentially required during construction			
Green outline Areas of ancient woodland located outside of the hybrid Bill limits that will be retained	Grassland habitat creation	Scale at A3: 1:5,000 0 50 100 150 200 Metres	
Red box Area of direct loss of ancient woodland (ha)	Landscape mitigation planting (scrub/woodland)		
Pink box Area of receptor site for ancient woodland soils (ha)	Grassed areas	Date: 21/02/19	
Orange box Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)			



Legend		Map Number EC-26-605-R1		HS2 Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA. © Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190. Doc Number: C861-ARP-EV-MAP-000-093705-P04 Date: 21/02/19
Map Name Ancient Woodland Strategy Clifford's Wood		Map Name Ancient Woodland Strategy Clifford's Wood		
Community Area 3: Stone and Swynnerton		Community Area 3: Stone and Swynnerton		

Legend

--- Rail alignment	Watercourse	Areas of ancient woodland located outside of the hybrid Bill limits that will be retained	Grassland habitat creation
Rail alignment formation	Water body	Area of direct loss of ancient woodland (ha)	Landscape mitigation planting (scrub/woodland)
Tunnel portal	Woodland	Area of receptor site for ancient woodland soils (ha)	Grassed areas
Headhouse	Landscape earthworks	Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)	
Community area boundary	Engineering earthworks		
Land potentially required during construction			



Map Series Information:

This map series shows ancient woodlands that are located within the land required for the construction of the Proposed Scheme. They also show the areas of woodland lost to construction of the Proposed Scheme, and areas of woodland habitat creation and enhancement that will be undertaken to partially compensate for these losses.

- Main Map Legend**
- Route in bored tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary

- Map sheets included in this community area
- Map sheets not included in this community area

Map Number
EC-26-INDEX-CA4

Map Name
**Index Map of:
Ancient Woodland Strategy**

Community Area 4:
Whitmore Heath to Madeley

hs2

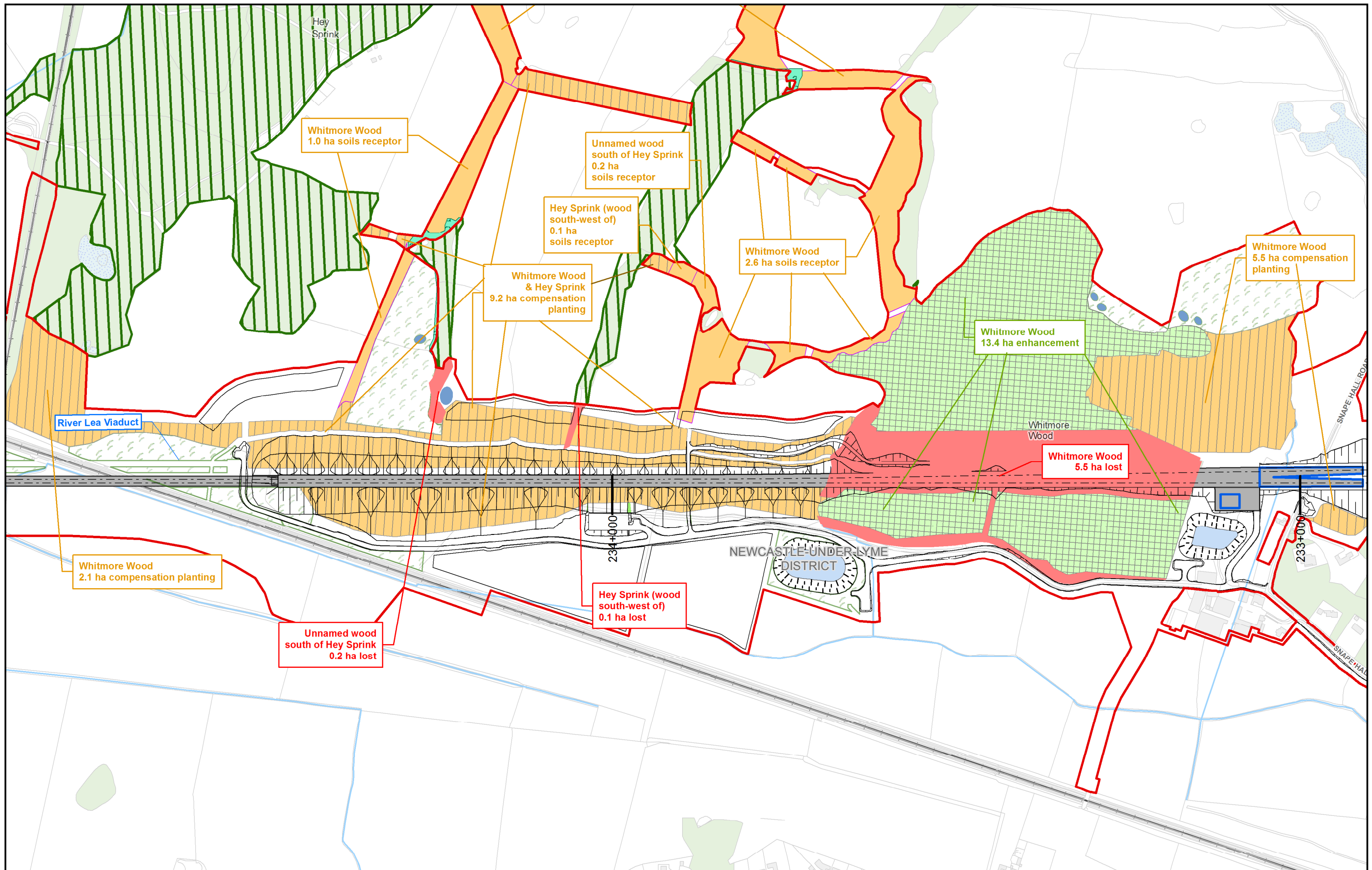
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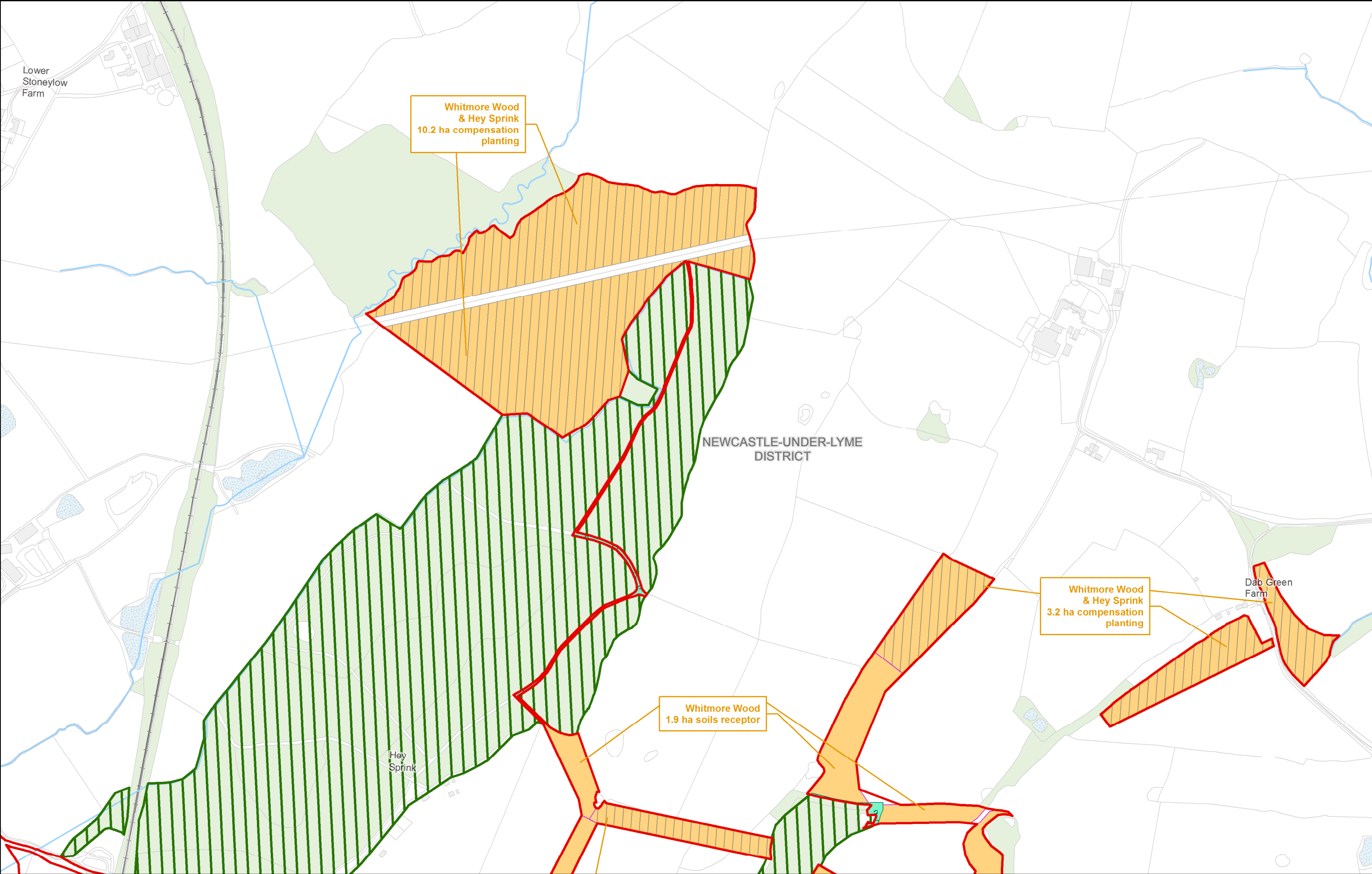
Scale at A3: 1:70,000

0 700 1,400 2,100 2,800
Metres

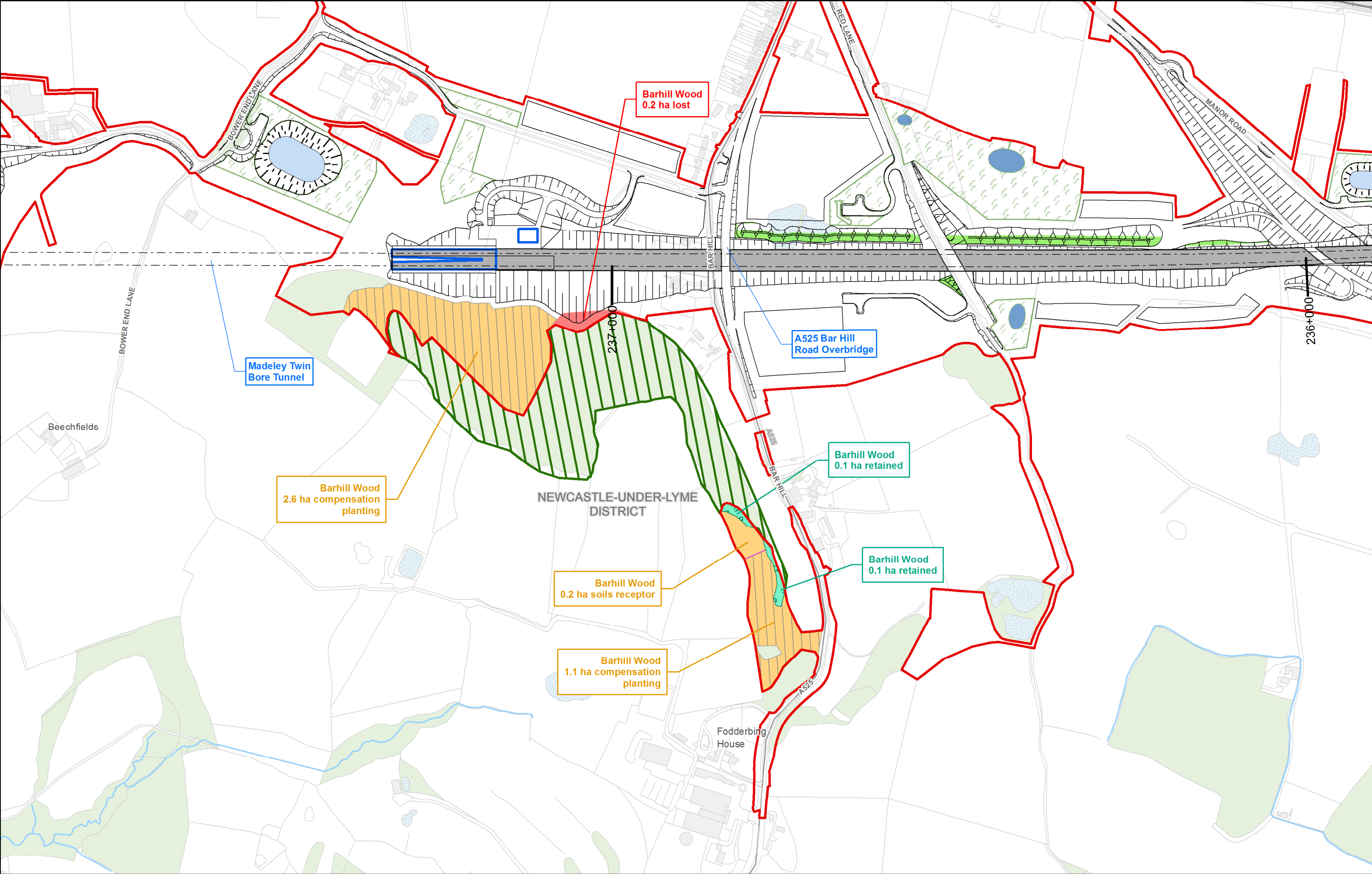
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Date: 21/02/19



Legend --- Rail alignment Rail alignment formation Tunnel portal Headhouse Community area boundary Land potentially required during construction Watercourse Water body Woodland Landscape earthworks Engineering earthworks 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) Ecological mitigation pond Grassland habitat creation Grassed areas	Map Number EC-26-606 Map Name Ancient Woodland Strategy Whitmore Wood, Hey Sprink (wood south-west of) and Unnamed wood south of Hey Sprink Community Area 4: Whitmore Heath to Madeley	HS2 Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA. © Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190. Doc Number: C861-ARP-EV-MAP-000-093606-P04 Date: 21/02/19 Scale at A3: 1:5,000 0 50 100 150 200 Metres
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Legend -- Rail alignment Rail alignment formation Tunnel portal Headhouse Community area boundary Land potentially required during construction Watercourse Water body Woodland Landscape earthworks Engineering earthworks 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) 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-26-606-R1 Map Name Ancient Woodland Strategy Whitmore Wood, Hey Sprink (wood south-west of) and Unnamed wood south of Hey Sprink Community Area 4: Whitmore Heath to Madeley	HS2 HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way. Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA. © Crown copyright and database rights 2019. Ordnance Survey Licence Number 100049190. Doc Number: C861-ARP-EV-MAP-000-093706-P04 Date: 21/02/19 Scale at A3: 1:5,000 0 50 100 150 200 Metres
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Legend

- Rail alignment
- Rail alignment formation
- Tunnel portal
- Headhouse
- Community area boundary
- Land potentially required during construction
- Watercourse
- Water body
- Woodland
- Landscape earthworks
- Engineering earthworks

- 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)
- Ecological mitigation pond
- Grassland habitat creation
- Grassed areas

Map Number	EC-26-607
Map Name	Ancient Woodland Strategy Barhill Wood
Community Area 4: Whitmore Heath to Madeley	



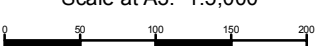
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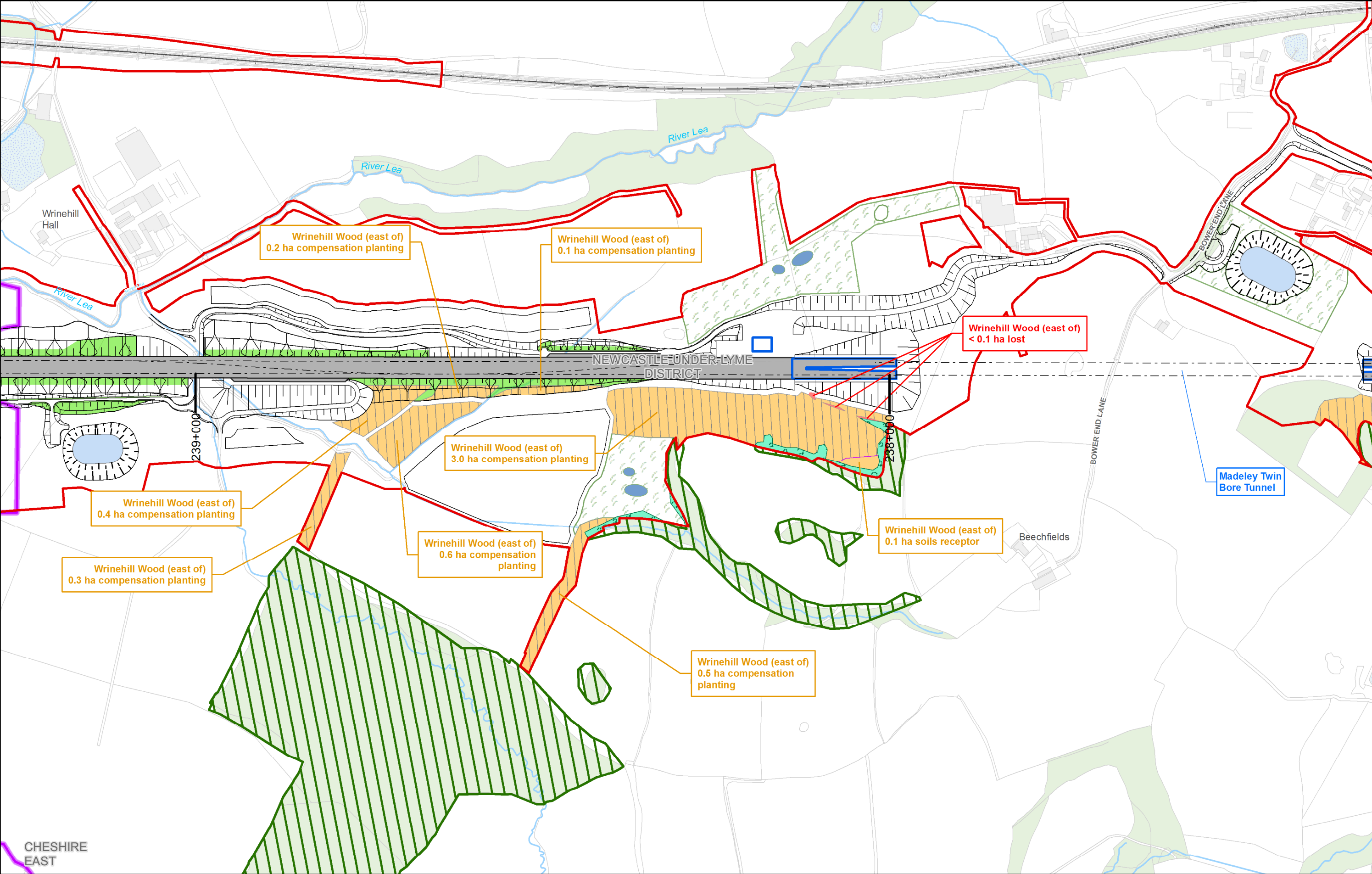
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Scale at A3: 1:5,000



Metres

Date: 21/02/19



Legend

- | | | | |
|---|---|--|--|
| <ul style="list-style-type: none">--- Rail alignment■ Rail alignment formation■ Tunnel portal■ Headhouse■ Community area boundary■ Land potentially required during construction | <ul style="list-style-type: none">— Watercourse■ Water body■ Woodland■ Landscape earthworks■ Engineering earthworks | <ul style="list-style-type: none">■ 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) | <ul style="list-style-type: none">■ Area of new planting to be provided in response to the loss of ancient woodland (excluding ancient woodland soil receptor area) (ha)■ Ecological mitigation pond■ Grassland habitat creation■ Grassed areas |
|---|---|--|--|

Map Number	EC-26-608
Map Name	Ancient Woodland Strategy Wrinehill Wood (east of)
Community Area 4: Whitmore Heath to Madeley	

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