

HIGH SPEED TWO PHASE 2a INFORMATION PAPER

E2: ECOLOGY

This information paper outlines the approaches taken to assessing, mitigating and compensating ecological impacts of the Proposed Scheme.

It will be of particular interest to those potentially affected by the Government's proposals for high speed rail.

This paper was prepared in relation to the promotion of the High Speed Rail (West Midlands-Crewe) Bill which is now enacted. It was finalised at Royal Assent and no further changes will be made.

If you have any queries about this paper or about how it might apply to you, please contact the HS2 Helpdesk in the first instance.

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1. Introduction

- 1.1. High Speed Two (HS2) is the Government's proposal for a new, high speed north-south railway. The proposal is being taken forward in phases: Phase One will connect London with Birmingham and the West Midlands. Phase 2a will extend the route to Crewe. Phase 2b will extend the route to Manchester, Leeds and beyond. The construction and operation of Phase One of HS2 is authorised by the High Speed Rail (London – West Midlands) Act 2017.
- 1.2. HS2 Ltd is the non-departmental public body responsible for developing and promoting these proposals. The company works to a Development Agreement made with the Secretary of State for Transport.
- 1.3. In July 2017, the Government introduced a hybrid Bill¹ to Parliament to seek powers for the construction and operation of Phase 2a of HS2 (the Proposed Scheme). The Proposed Scheme is a railway starting at Fradley at its southern end. At the northern end it connects with the West Coast Main Line (WCML) south of Crewe to allow HS2 services to join the WCML and call at Crewe Station. North of this junction with the WCML, the Proposed Scheme continues to a tunnel portal south of Crewe.
- 1.4. The work to produce the Bill includes an Environmental Impact Assessment (EIA), the results of which are reported in an Environmental Statement (ES) submitted alongside the Bill. The Secretary of State has also published draft Environmental Minimum Requirements (EMRs)², which set out the environmental and sustainability commitments that will be observed in the construction of the Proposed Scheme.
- 1.5. The Secretary of State for Transport is the Promoter of the Bill through Parliament. The Promoter will also appoint a body responsible for delivering the Proposed Scheme under the powers granted by the Bill. This body is known as the 'nominated undertaker'. The nominated undertaker will be bound by the obligations contained in the Bill and the policies established in the EMRs. There may be more than one nominated undertaker.
- 1.6. These information papers have been produced to explain the commitments made in the Bill and the EMRs and how they will be applied to the design and construction of the Proposed Scheme. They also provide information about the Proposed Scheme itself, the powers contained in the Bill and how particular decisions about the Proposed Scheme have been reached.

¹ The High Speed Rail (West Midlands – Crewe) Bill, hereafter 'the Bill'.

² For more information on the EMRs, please see Information Paper E1: Control of Environmental Impacts.

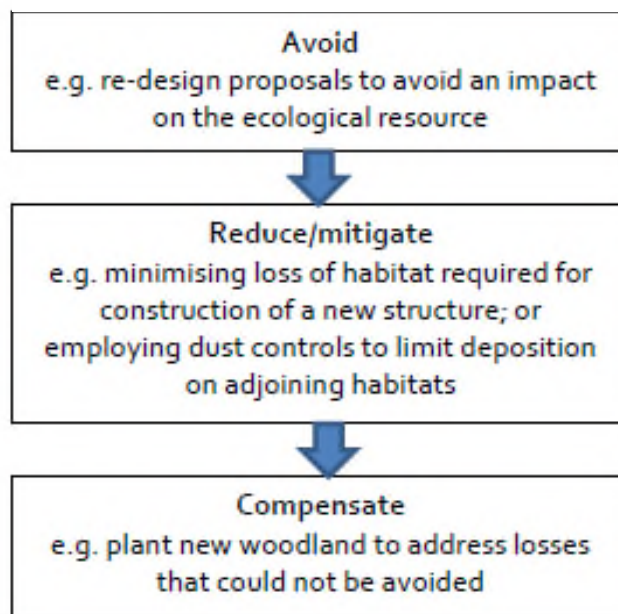
2. Overview

- 2.1 This information paper sets out the approaches taken to assessing, mitigating and compensating for the ecological impacts of the Proposed Scheme. It also explains key biodiversity policies of the Promoter and the approach taken to ancient woodland impacts, as well as the long term management and monitoring commitments in place.

3. Approach to ecological assessment

- 3.1. The design of the Proposed Scheme reflects the 'mitigation hierarchy' consistent with National Planning Policy Framework³ and guidance on Environmental Impact Assessment. This approach is set out below.

Figure 1 The 'Mitigation Hierarchy'



- 3.2. Using the hierarchy, priority is given to avoiding or preventing effects where reasonably practicable; if not, to reducing or abating those effects; and then, if necessary, to offsetting them through repair (restoration or reinstatement) or compensation. Efforts have been made to reduce the duration, scale and extent of the anticipated effects in instances where avoidance has not been reasonably practicable. Appropriate compensation or enhancements have been identified to offset effects that are still anticipated following mitigation.
- 3.3. The approach used by HS2 Ltd for ecological mitigation and compensation is set out in the Scope and Methodology Report addendum (SMR) of the ES (Ecological

³ DCLG (2019) National Planning Policy Framework, London: HMSO.

Principles of Mitigation, Volume 5: Appendix CT-001-002⁴) and explains the factors determining the cases in which these should be applied.

- 3.4. The ecological impact assessment has taken account of guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM)⁵. It considers all ecological receptors which have the potential to be affected by the construction and/or operation of the Proposed Scheme. The assessment includes the consideration of effects arising from habitat loss, fragmentation of sites, severance of ecological networks, noise and visual disturbance, barrier effects to movement of fauna, lighting, changes in water quality and quantity, air pollution, and mortality as a result of collisions with trains. In line with the CIEEM approach, the evaluation of species receptors has been based on the distribution and status of the species concerned, rather than being based solely on the legal protection afforded to that species.
- 3.5. The spatial scope of the assessment depends on the ecological receptor under consideration and the magnitude and nature of the potential impacts. It has, as a minimum, included areas located within and adjacent to the land required for the construction of the Proposed Scheme.
- 3.6. The assessment has taken account of both desk based and field surveys. Existing biological data for the Proposed Scheme has been obtained from relevant Local Biological Records Centres and from national and local specialist data sources, such as wildlife trusts and ornithological groups. Local biodiversity action plans and ancient woodland inventories have also been consulted.
- 3.7. A wide range of field surveys have been conducted to inform the ES. The survey methodologies used have been based on relevant best practice approaches. The survey methods used are set out in the SMR addendum (Ecological Field Survey Methods and Standards, Volume 5: Appendix CT-001-002) of the ES submitted with the Bill⁵.
- 3.8. A precautionary approach to valuation has been used for instances where baseline information is incomplete, to ensure that all likely impacts of the Proposed Scheme have been identified. The degree of precaution built into the assessment for each receptor reflects the level of confidence in the existing data available.

4. No net loss in biodiversity

- 4.1. The Proposed Scheme has the objective of seeking to achieve no net loss in biodiversity at a route-wide level. In order to demonstrate progress towards this objective, habitat losses and gains will be measured using a modified version of the Department for Environment, Food and Rural Affairs' (Defra) biodiversity offsetting metric. This was developed from the Defra biodiversity offsetting pilot

⁴ Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627188/E24A_CT-001-002_Part_1_WEB.pdf

⁵ Chartered Institute of Ecology and Environmental Management (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine. CIEEM.

metric in consultation with Defra and Natural England to make it appropriate for use on a large linear infrastructure scheme.

- 4.2. The metric has been amended following an independent review by Natural England in late 2016⁶. Details of the metric are set out in the SMR addendum (Methodology for Demonstrating No Net Loss in Biodiversity, Volume 5: Appendix CT-001-002) of the ES.
- 4.3. It should be noted that the metric is used as an accounting tool to check that the mitigation and compensation provided through the EIA process is in line with the project objective; it has not been used to inform the level of compensation provision. As the design of the Proposed Scheme is modified or becomes more detailed, it is intended that the no net loss calculation will be run at appropriate intervals to measure progress towards the no net loss objective.
- 4.4. While every effort has been made to avoid losses of ancient woodland, there are some instances where due to other design constraints, losses are unavoidable. HS2 Ltd acknowledges that ancient woodland is an irreplaceable habitat and as such, losses as well as associated compensation measures will not be considered within the scope of the no net loss calculation. A separately produced Ancient Woodland Strategy has been published⁷ which outlines the specific measures being taken to compensate for unavoidable losses at each confirmed ancient woodland site.

5. Protected sites

- 5.1 The EIA undertaken for the Proposed Scheme has taken account of internationally, nationally and locally designated sites for wildlife. The Proposed Scheme will not directly affect any internationally designated sites. Habitats Regulations Assessment (HRA) screening reports and associated addenda for any international sites considered as part of the assessment are available in the SMR (Volume 5: Appendix EC-017-001 to Appendix EC-017-005) of the ES.
- 5.2 The Proposed Scheme will not directly affect any nationally designated sites, including Sites of Special Interest (SSSI). It is considered that any potential indirect impacts on nationally designated sites will be effectively mitigated through site-specific control measures, including those set out in the draft Code of Construction Practice (CoCP), and site specific mitigation. As such there will be no likely significant effects on the conservation status of the features for which the site is designated.
- 5.3 As reported in the Supplementary Environmental Statements and Additional Provision Environmental Statements, eighteen non-statutory Local Wildlife Sites

⁶ Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/565691/review-of-hs2-no-net-loss-metric.pdf

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/682444/hs2_phase_2_a_ancient_woodland_strategy.pdf

(LWS) and fourteen locally designated Biodiversity Alert Sites (BAS) will be subject to significant loss and/or fragmentation effects. Where a significant adverse effect on the integrity of a LWS is expected, sufficient compensation will be incorporated into the Proposed Scheme to address effects on the conservation status of the habitats and species for which that LWS was designated. Effects to individual sites and associated mitigation and/or compensation are described in detail in Section 8 of the Volume 2 Community Area reports within the ES.

- 5.4 HS2 Ltd has carried out an early review to identify existing ancient woodlands along the line of route not already listed on the ancient woodland inventory (AWI). This review found that the Proposed Scheme will result in loss of approximately 9.8ha of ancient woodland across 11 sites, 2 of which were already on the AWI and 9 of which have been added to the AWI. To seek to compensate for the loss of ancient woodland the nominated undertaker will use best practice measures such as re-using the ancient woodland soils where practicable, enhancement of retained woodland and creating new mixed deciduous woodland. However, it is acknowledged that it is not possible to replace ancient woodland. Losses of habitats that are irreplaceable are reported in the ES as permanent adverse effects.
- 5.5 HS2 Ltd recognises that ancient and veteran trees are an irreplaceable resource and their potential loss will result in a permanent adverse effect that is significant at district/borough level in each case. Where reasonably practicable, measures will be taken to protect and retain ancient and veteran trees within and adjacent to the proposed works area to reduce the number that will be impacted. Where loss is unavoidable, the trees will be soft felled and sections placed within retained habitats to provide a continued deadwood resource.

6. Protected species

- 6.1. Protected species that may be affected by the Proposed Scheme include , but are not limited to, a number of bat species, barn owl, great crested newt, otter, water vole and badger.
- 6.2. Mitigation and compensation to address effects on legally protected species will, where appropriate, include translocation of species, the provision of replacement habitat and provision of special measures such as underpasses and green bridges to facilitate the movement of species across the route. These measures are described in Section 8 of the Volume 2 Community Area reports in the ES.
- 6.3. Formal applications for derogation and mitigation licences for protected species will be made after Royal Assent and are likely to be accompanied by updated baseline surveys.

7. Habitat creation and enhancement

- 7.1. The Proposed Scheme will result in a loss of habitats outside of protected sites including non-ancient woodland, veteran and ancient trees, grassland, wetland and hedgerow. Many of these will qualify as habitats of principal importance (as

listed under Section 41 of the Natural Environment and Rural Communities Act 2006).

- 7.2. Where habitats of principal importance (including lowland mixed deciduous woodland, lowland meadow and ponds) will be lost, opportunities to create new compensatory habitat have been explored. These areas are described in Section 8 of the Volume 2 Community Area reports in the ES.
- 7.3. In addition to the creation of new habitats, some existing habitats will be subject to enhancement (where appropriate) as part of the proposed compensation measures.

8. Design techniques

- 8.1. The Proposed Scheme incorporates a wide range of design techniques to mitigate or compensate effects on species and habitats.
- 8.1. The location and design of compensatory habitat creation areas has sought to adhere to the key Lawton Review⁸ principles of '*more, bigger, better and joined*'. These aim to result in areas of habitat creation 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 and allowing species to move more freely in response to changing climatic conditions.
- 8.2. The Proposed Scheme includes a number of design features to facilitate the safe movement of species from one side to the other. This includes stretches of the railway in tunnel and on viaduct, as well as passages underneath or over the line such as underpasses, culverts, ecological under bridges and green bridges. On roads associated with the Proposed Scheme, measures such as 'hop-overs' may be used to facilitate the safe movement of bats⁹.
- 8.3. A number of green bridges are included on a precautionary basis in the design of the Proposed Scheme. These will further facilitate the movement of wildlife across the Proposed Scheme. The main difference between a standard bridge and a green bridge is that a green bridge is designed and built with increased width to allow vegetation, typically including one or two hedgerows comprising a range of local/native species, to be planted along the structure.
- 8.4. In order to encourage wildlife species to use green bridges, planting on the structures will be linked to the surrounding vegetation at the approaches to the

⁸ Lawton, J.H. et al. (2010) *Making Space for Nature: a review of England's wildlife sites and ecological network*. Report to Defra.

⁹ Hop-overs are where tall vegetation/ trees exist or have been planted either side of a road with the aim of keeping bats flying at height over the road. The need for each will be assessed on a case by case basis during detailed design.

bridge to provide connections with the existing habitats. The design of each green bridge is selected according to the site specific requirements at that location.

- 8.5 The Proposed Scheme includes five green bridges as described in Section 8.5 of the Volume 2 Community Area reports within the ES. Their locations are detailed in Table 1 below. These green bridges are all included for important populations of scarce bat species (other than Bechstein’s bats) and high value assemblages of bats.

Table 1: Proposed green bridges along the Proposed Scheme

Community Area	Bridge name
CA2	Colwich Bridleway 23 accommodation green overbridge
CA2	Ingestre green overbridge
CA3	Swynnerton Estate North green overbridge
CA3	Swynnerton Footpath 15 green overbridge
CA4	Madeley Bridleway 1 accommodation green overbridge

9. Detailed design and further approvals

- 9.1. The design of the Proposed Scheme in the Bill is in outline and the EIA is based upon a reasonable worst-case assessment of the impacts. The EMRs will ensure that the impacts of the Proposed Scheme do not exceed those stated in the ES. Following Royal Assent, detailed design will be undertaken, during which contractors will be required to take reasonable steps to further reduce the impacts assessed in the ES. For example, the ES assumes that all hedgerows within the construction boundary will be destroyed, whereas in practice such a scenario is highly unlikely: the nominated undertaker is expected to be able to employ methods to reduce such habitat loss. This is consistent with the mitigation hierarchy of seeking to avoid impacts in the first instance.
- 9.2. Further surveys will be undertaken to verify the baseline ecological conditions described in the ES and inform detailed design work.
- 9.3. Bespoke Ecology Site Management Plans will be prepared at detailed design stage, which will specify the ecological objectives of each ecological habitat creation area, the measures to be taken to establish, maintain and monitor the habitats and the detailed planting requirements. They will also be prepared for each statutory and non-statutory site of nature conservation importance and ancient woodland directly affected by the construction of the Proposed Scheme.
- 9.4. Further controls are included in the Bill to ensure that the Proposed Scheme has adequately mitigated its impacts on ecological receptors.
- 9.5. Schedule 17 of the Bill requires planning authorities along the line of route to approve plans and specifications for building works. Planning authorities may

impose conditions on approval on the grounds that the design or external appearance of the building works ought to be modified to preserve a site of nature conservation value. For more information, see Information Paper B2: Main Provisions of the Planning Regime.

- 9.6. Planning authorities are also required to give approval to the bringing of scheduled works into operational use. They will usually consider nature conservation issues as part of the approval process for each work.
- 9.7. When undertaking detailed design of the ecological measures proposed in the Environmental Statement, the nominated undertaker will be required to do so in accordance with the Nominated Undertaker's technical requirements.

10. Managing impacts through construction

- 10.1. Impacts on ecological receptors will be managed during the construction phase through Section 9 of the Draft CoCP. It requires the nominated undertaker to ensure that procedures are implemented to control and limit disturbance to areas of nature conservation interest and protected species in accordance with relevant legislative requirements and accepted industry practice.
- 10.2. Ecological works such as planting and habitat creation for translocated species will be planned early within the construction programme so that new habitats are created as soon as reasonably practicable, and to ensure the time between habitat loss and the creation of new habitats is minimised.
- 10.3. The nominated undertaker will define a programme for undertaking ecological surveys prior to and during construction. The surveys will refine the mitigation and control measures required during construction as appropriate and inform appropriate monitoring during construction.
- 10.4. The nominated undertaker will require its contractors to undertake appropriate monitoring of the consequences of construction works on ecological resources and of the effectiveness of the management measures designed to control ecological effects, associated with works that may affect protected or notable species, statutory designated or non-statutory sites of ecological interest.

11. Ensuring outcomes

- 11.1 The nominated undertaker will ensure compliance with applicable legislation for the protection of areas of nature conservation interest and of protected species. Relevant provisions include, but are not limited to, the following:
 - Wildlife and Countryside Act 1981 (as amended);
 - The Conservation of Habitats and Species Regulations 2017 (as amended);
 - Natural Environment and Rural Communities Act 2006;

- Countryside and Rights of Way Act 2000;
 - Weeds Act 1959; and
 - Protection of Badgers Act 1992.
- 11.2 The nominated undertaker will be required to demonstrate that there is sufficient mitigation/ compensation through the creation of new habitats and/or provision of special measures such as underpasses, ecological underbridges or green bridges to maintain the populations of protected and other notable species affected by the Proposed Scheme.
- 11.3 In order to satisfy protected species licencing requirements and achieve the Proposed Scheme’s objective of seeking to achieve no net loss in biodiversity, habitats created for mitigation and compensation will need to be managed appropriately. The draft Environmental Memorandum contains a commitment to ensuring appropriate management by the Promoter and the nominated undertaker. For more information, see Information Paper E1: Control of Environmental Impacts.
- 11.4 HS2 Ltd is committed to monitoring the effectiveness of ecological mitigation and compensation measures for a sufficient period to ensure the objectives of the proposals for nature conservation are achieved. Monitoring may also need to continue beyond the establishment period.
- 11.5 An Ecology Review Group comprised of relevant statutory bodies, non-governmental organisations and local authorities will review the outputs of monitoring for habitat creation sites and make recommendations for remedial action where appropriate.
- 11.6 An appropriate management, maintenance and monitoring strategy for ecologically-led habitat creation will consist of three interrelated elements:
- Management, maintenance and monitoring approaches, durations and frequencies for the period during the establishment of new habitats;
 - Management, maintenance and monitoring prescriptions, durations and frequencies beyond the point when establishment goals have been met (i.e. longer-term commitments); and
 - The mechanism for providing all management, maintenance and monitoring.
- 11.7 For the first of these elements, Natural England have provided advice on appropriate generic durations for the maintenance, management and monitoring during the establishment of ecologically-led habitat creation. Table 2 provides broad generic indications of the likely durations of monitoring, maintenance and management during the establishment period for those habitats affected by the Proposed Scheme.
- 11.8 As there are no published industry standards, the durations quoted draw upon current Defra guidance and professional experience of typical management durations negotiated with stakeholders for other large-scale projects.

- 11.9 Table 2 sets out the broad habitat categories that are found within the Bill limits¹⁰. During the detailed design phase, the design of these areas will be developed. Habitat mosaics will be required to include a number of these types of habitat in many cases. Additional habitat types may be created outside of Bill limits through separate agreement. The likely durations of monitoring, maintenance and management for these habitat types will be discussed with Natural England.
- 11.10 The durations shown in Table 2 will be used as a guide. In exceptional cases (e.g. where there is reason to believe that a habitat will be particularly difficult to create) there may be deviation from the figures provided. In consultation with Natural England, HS2 Ltd intends to identify measurable goals (or 'success criteria') for all habitat areas to be created. Monitoring during the establishment of new habitats will track progress towards these goals. If monitoring shows that these goals have not been achieved within the indicative monitoring and maintenance periods stated in Table 2, the duration may need to be extended, for example in response to unusual weather conditions such as prolonged drought. Similarly, if it can be confirmed that the required goal has been met earlier than expected, the standard monitoring period may be shortened. The frequency of monitoring will generally decrease with time where establishment towards the agreed objectives is progressing in line with expectations. This principle is shown with indicative times in Table 2.

Table 2: Indicative management, monitoring and maintenance durations for habitats to be created on the Proposed Scheme

Habitat type	Generic duration of monitoring, management & maintenance during establishment	Indicative monitoring intervals ¹¹ during habitat establishment	Comments
Open mosaic habitats on previously developed land	5 years	Annually for 5 years	<ul style="list-style-type: none"> A standard duration is likely to be applied to all habitats of this type.
Watercourses	5 years	6 months & Years 1, 3 and 5	<ul style="list-style-type: none"> A standard duration is likely to be applied to all habitats of this type.
Ponds	5 years	6 months & Years 1, 3 and 5	<ul style="list-style-type: none"> A standard duration is likely to be applied to all habitats of this type.

¹⁰ For more information see Information Paper B3: Limits on Parliamentary Plans.

¹¹ Where the duration of monitoring is provided as a range, this column indicates the monitoring intervals that would be expected for the longest monitoring period covered by that range.

Habitat type	Generic duration of monitoring, management & maintenance during establishment	Indicative monitoring intervals ¹¹ during habitat establishment	Comments
Grasslands	5-15 years	Years 1,2,3,4,5 and, 8, 11 and 14.	<ul style="list-style-type: none"> • Areas of grassland with the primary purpose of landscaping are likely to fall under a 5 year regime; • Majority of grassland provided as compensation for losses is likely to be subject to a 15-year regime.
Hedgerows	5-10 years	6 months & Years 1, 3, 5, 7 & 10.	<ul style="list-style-type: none"> • Hedgerows provided specifically for ecological purposes (e.g. to provide connectivity between other areas of planting, or those translocated due to their ecological value) may be subject to a regime of up to 10 years; • Majority of hedgerows will be subject to a 5-year regime.
Young heathland/acid grassland	15	6 months & Years 1, 2, 3, 5, 7, 10, 13, 15.	<ul style="list-style-type: none"> • All areas of this habitat affected by the proposed scheme are fragmented lowland heathland; • 15 years is considered appropriate, as the aim is to create similar or better habitat than that lost.
Woodland (including screening planting)	10-50 years	6 months & Years 1, 3, 5, 7, 10, 13, 15, 20, 25, 30, 35, 40, 45, 50.	<ul style="list-style-type: none"> • Duration of 10 years for areas provided for primary purpose of landscaping; • Duration of up to 50 years during establishment for those areas that are created specifically for ecological mitigation/ compensation. The 50-year period would be provided for all locations where the translocation of ancient woodland soils is proposed.

11.11 The durations shown in Table 2 cover only the management, maintenance and monitoring proposed during the period of establishment. Further discussions are in progress with Defra and Natural England regarding an appropriate approach to

on-going management, maintenance and monitoring beyond the establishment period.

- 11.12 After an initial period of maintenance, the nominated undertaker will seek to return the majority of land to previous landowners or other interested parties (such as local wildlife trusts, woodland trust, local authorities), where agreement can be reached that will ensure the continued objectives of the mitigation are maintained into the future.
- 11.13 Where agreement cannot be reached, the land will be retained and maintained by the nominated undertaker, at least until a maintenance agreement is put in place with a suitable owner or party.
- 11.14 For land that is retained by the nominated undertaker, the nominated undertaker will appoint a managing company (or companies) to ensure the adequate maintenance of mitigation.

12. More information

- 12.1 More detail on the Bill and related documents can be found at: www.gov.uk/HS2