

# **High Speed Rail (Crewe – Manchester)**

## **Background information and data**

### **Ecology and biodiversity**

BID EC-002-OR003

Off-route works: Annandale depot

Ecological baseline data

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## Department for Transport

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

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# 1 Introduction

- 1.1.1 This report presents ecological baseline data relevant to the Proposed Scheme in relation to the off-route works at Annandale depot.
- 1.1.2 The Environmental Statement should be referred to for details of the ecology impact assessment. Effects which are significant below local level relevant to Annandale depot are listed in the Ecological register of significant effects below local level, Volume 5, EC-003-OR003<sup>1</sup>. Information relating to designated sites relevant to the Annandale depot is provided in Volume 5, EC-001-OR003<sup>2</sup>. This report should be read in conjunction with the Volume 5 Ecology Map Book<sup>3</sup>, Map Series EC-01 and the Background Information and Data Ecology Map Book, Map Series EC-02.
- 1.1.3 Reporting to inform a Habitats Regulations Appraisal Screening Report and Appropriate Assessment for the Solway Firth Special Protection Area (SPA), Upper Solway Flats and Marshes Ramsar Site and Solway Firth Special Area of Conservation (SAC) is set out in report Off-route effects Annandale depot - Habitats Regulations Appraisal, Volume 5, EC-004-OR003<sup>4</sup>.

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Ecological register of significant effects below local level, Volume 5, Appendix EC-003-OR003*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Ecological baseline data - designated sites, Volume 5, Appendix EC-001-OR003*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Volume 5, Ecology Map Book*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>4</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Document to inform a Habitats Regulations Appraisal Screening Report and Appropriate Assessment for the Solway Firth SPA, Upper Solway Flats and Marshes Ramsar Site and Solway Firth SAC, Volume 5, Appendix EC-004-OR003*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

## 2 Phase One habitat survey

### 2.1 Methodology

2.1.1 Relevant desk study information was obtained from the following sources:

- South West Scotland Environmental Information Centre (SWSEIC);
- NatureScot (Habitat Map of Scotland<sup>5</sup>); and
- Forestry Commission Scotland (Native Woodland Survey of Scotland<sup>6</sup>).

2.1.2 In addition, aerial imagery was used to interpret broad habitat types present. The results of interpretation are displayed on the Background Information and Data Map Book, Map Series EC-02.

### 2.2 Deviations, constraints and limitations

2.2.1 In many locations it has not been possible to determine the precise habitat type for Phase 1 habitat survey mapping. This is because all habitat types, including area calculations, have been interpreted using aerial photography and publicly available data rather than field survey as the site could not be accessed. This allows for broad habitat descriptions to be compiled, supplemented by data held by third parties (for example in relation to woodland types).

### 2.3 Baseline

2.3.1 The review of aerial imagery and third-party data recorded the following habitat types displayed on the Background Information and Data Map Book, Map Series EC-02.

#### **Woodland**

2.3.2 There is one woodland block within the land required for the construction of the Proposed Scheme at Annandale depot. This is 0.2ha of mixed semi-natural woodland located south of Grahamshill Railway Cottages comprising ancient woodland. The woodland parcel is contained within a larger mapped area included on the Scottish Ancient Woodland Inventory

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<sup>5</sup> Scottish Natural Heritage (2018), *Habitat Map of Scotland (HabMoS)*, Version dated 24/04/2018. Available online at: <http://gateway.snh.gov.uk/natural-spaces/index.jsp>.

<sup>6</sup> Forestry Commission Scotland (2014), *Scotland's Native Woodlands; Results from the Native Woodland Survey of Scotland*. Available online at: <https://www.forestresearch.gov.uk/documents/7071/FCMS126.pdf> with dataset viewable using: <https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18>.

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(AWI). It is possibly long-established woodland which could be of plantation origin and may qualify as a conservation priority in the Dumfries and Galloway Biodiversity Action Plan<sup>7</sup>.

- 2.3.3 A heritage review was undertaken by HS2 Ltd to evaluate the distribution of ancient and potential ancient woodland of relevance to the assessment in the Annandale area. Potential ancient woodland referenced in this report is land that is currently wooded and appears to have been continually wooded, since at least 1750, outwith the Scottish AWI. The heritage review considered the AWI, the native woodland survey of Scotland and freely available aerial photography. The AWI dataset represents a provisional guide to the location of ancient woodland in Scotland, which is derived from the Roy maps (c1750) and the Ordnance survey (OS) 1st edition (c1860). This data requires careful interpretation when used to determine the status of individual woodland areas.
- 2.3.4 There are also four other ancient woodlands located adjacent, or in proximity to the land required for the construction of the Proposed Scheme:
- Blacksike Wood and Bensmoor Wood, 4.4ha and 2.4ha in area respectively, comprising long-established (or plantation origin) woodland adjacent to the north and south of the West Coast Main Line (WCML) at Quintinshill railway bridge;
  - woodland east of Grahamshill Railway Cottages, 1.2ha in area, comprising long-established (or plantation origin) woodland adjacent to land required for construction of the Proposed Scheme at Whinnyrig;
  - Mossknowe Lodge Wood, 0.7ha in area, comprising long-established (or plantation origin) woodland and located adjacent to land required for the construction of the Proposed Scheme alongside the existing B7076 Roman road; and
  - Cove Wood, 48ha in area comprising ancient (of semi-natural origin) woodland located 210m south of the land required for construction of the Proposed Scheme, to the south of the WCML.
- 2.3.5 Four further potential ancient woodlands are of relevance to the assessment in the Annandale area:
- plantation east of Nook Cottage, 0.6ha in area, comprising long-established (or plantation origin) woodland adjacent to land required for the construction of the Proposed Scheme alongside the B7076 Roman road;
  - Billy's Wood, 0.7ha in area, comprising semi-natural woodland and located adjacent to land required for construction of the Proposed Scheme, to the north of the WCML;
  - Manse Wood, 0.1ha in area and located 48m south of the land required for construction of the Proposed Scheme, to the south of the WCML and Kirkpatrick-Fleming; and

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<sup>7</sup> Dumfries & Galloway Biodiversity Partnership (2009), *Dumfries and Galloway Biodiversity Action Plan* [online]. Available online at: [https://www.dumgal.gov.uk/media/19945/Local-Biodiversity-Action-Plan/pdf/Local\\_Biodiversity\\_Action\\_Plan.pdf](https://www.dumgal.gov.uk/media/19945/Local-Biodiversity-Action-Plan/pdf/Local_Biodiversity_Action_Plan.pdf).



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- Kirkpatrick Burn Wood, 0.2ha in area and located 55m south of the land required for construction of the Proposed Scheme, to the south of the WCML and Kirkpatrick-Fleming.

2.3.6 There is one other area of woodland that qualifies, or is likely to qualify, as lowland mixed deciduous woodland, a habitat of principal importance on the Scottish Biodiversity List. This is an unnamed woodland, 1.2ha in area, comprising semi-natural woodland located adjacent to the west of land required for construction of the Proposed Scheme and to the south of the WCML.

## Scrub

2.3.7 In total, 6.4ha of dense/continuous scrub is present within the land required for the construction of the Proposed Scheme. The majority of this is located along the WCML.

## Hedgerows

2.3.8 In total, 10.1km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. On a precautionary basis, and in the absence of detailed survey information, hedgerows are assumed to be native species-rich and a proportion is known to contain trees based on aerial imagery.

## Grassland

2.3.9 Grassland is the main habitat type present within the land required for the construction of the Proposed Scheme. The majority appears to be used for agricultural purposes and is likely to comprise improved grassland and species-poor semi-improved grassland, at least in part, managed for stock grazing. Semi-improved grassland covering an area of 9.4ha, and marshy grassland covering an area of 8.6ha, occur within land required for the construction of the Proposed Scheme.

2.3.10 To the north-west of land required for the construction of the Proposed Scheme, is a 14ha area of grassland named Gretna Flow. This land is identified on OS mapping and assumed to comprise semi-improved acid grassland, parts of which may be species-rich and qualify as a habitat of principal importance.

## Watercourses

2.3.11 One small watercourse is present within the land required for construction of the Proposed Scheme; the Ewes Burn. It joins Stand Burn and Kirtle Water, both rivers to the south. Kirtle Water is in the Gretna Coastal catchment of the Solway Tweed river basin. The current overall condition status of Kirtle Water is poor<sup>8</sup>. The combined biological elements score is

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<sup>8</sup> Scottish Environment Protection Agency (2017), *Water Classification Hub*. Available online at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/>.

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also poor (reflecting fish and fish ecology measures), although macroinvertebrates and macrophytes are recorded as good.

- 2.3.12 The Ewes Burn may qualify as a habitat of principal importance, and be covered under the Lowland Burns and Ditches category of the Dumfries and Galloway Biodiversity Action Plan.

## Water bodies

- 2.3.13 Five water bodies were recorded within 500m of the land required for construction of the Proposed Scheme: one east of Mossknowe, three north-west of Gretna services and Gavins Loch east of Redhall Castle. The nearest water body is 280m to the south of the land required for the construction of the Proposed Scheme. All of the water bodies are separated from the majority of land required for construction of the Proposed Scheme by the A74(M), which lies to the south of the land required for construction of the Proposed Scheme.
- 2.3.14 Ditches appear to be present along field boundaries within land required for construction of the Proposed Scheme; however, aerial photography does not allow for them to be accurately mapped.

## Arable and cultivated land

- 2.3.15 Arable fields are present within the land required for construction of the Proposed Scheme (75.1ha), bounded by ditches, hedgerows and trees.

## Buildings and structures

- 2.3.16 No buildings or agricultural structures are visible within the land required for construction of the Proposed Scheme. Buildings are present on immediately adjacent land and include farm buildings and residential properties located on the B7076 Roman Road to the south of the Proposed Scheme. Farm buildings, with access routes through the land required for the Proposed Scheme, are also present to the north of the WCML.

## 3 Amphibians

### 3.1 Methodology

3.1.1 Desk study records for amphibians were obtained from the following sources and available documents:

- SWSEIC; and
- NatureScot.

### 3.2 Deviations, constraints and limitations

3.2.1 Survey in accordance with the field survey methods and standards (FSMS)<sup>9</sup> protocol was not possible and this is a significant limitation to the assessment of ecological impacts.

### 3.3 Baseline

3.3.1 An initial scoping exercise was undertaken to identify any mapped water bodies located within 500m of the land required for the construction of the Proposed Scheme. No water bodies were identified that were not separated from the land required for construction of the Proposed Scheme by a major barrier to amphibian movement (for example the A74(M)) or made ground.

3.3.2 In addition, desk study records were reviewed. Records of palmate newt (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*), common toad (*Bufo bufo*) and common frog (*Rana temporaria*) were identified within the search area. The nearest records were for palmate newt and common frog 1,235m to the south and palmate newt and common toad 1.25km to the north; spatial accuracy was to 1,000m and 100m respectively.

3.3.3 No records indicating the presence of great crested newts (*Triturus cristatus*) were returned within the search area of 500m as defined in the FSMS. This is consistent with modelling undertaken on behalf of NatureScot (formerly Scottish Natural Heritage), that indicates a limited range for great crested newts in the vicinity of the Proposed Scheme<sup>10</sup>.

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<sup>9</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Technical Note – Ecology and biodiversity – Ecological field survey methods and standards (FSMS) included in the Environmental Impact Assessment Scope and Methodology Report (SMR), Volume 5, CT-001-00001*. Available online at:

<https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>10</sup> Wilkinson, J.W., Arnell, A., Driver, D. and Driver, B. (2014), *Elaborating the distribution of the great crested newt in Scotland (2010-2011)*, Scottish Natural Heritage Commissioned Report No. 793. Available online at: <https://www.nls.uk/e-monographs/2014/793.pdf>.

## 4 Reptiles

### 4.1 Methodology

4.1.1 Desktop reptile records have been obtained within 5km of the land required for the construction of the Proposed Scheme from the following sources:

- SWSEIC; and
- National Biodiversity Network (NBN) Gateway.

### 4.2 Deviations, constraints and limitations

4.2.1 Survey in accordance with the FSMS protocol was not possible and this is a significant limitation to the assessment of ecological impacts.

### 4.3 Baseline

4.3.1 Records returned from SWSEIC confirmed the presence of adder (*Vipera berus*) on Raeburn Flow, 1,320m to the north of land required for construction of the Proposed Scheme, and near to the River Sark and South Solway Mosses, within 950m and 2km to the east respectively. In addition, NBN Gateway records indicate the presence of grass snake (*Natrix helvetica*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) within 5km to the north-east of land required for construction of the Proposed Scheme.

## 5 Birds

### 5.1 Methodology

- 5.1.1 Desktop bird records including those of Schedule 1 birds have been obtained within 5km of the land required for the construction of the Proposed Scheme from SWSEIC.
- 5.1.2 Additionally, three observational survey visits have been completed during the winter period 2020-21 to gather records of bird species present and visible from publicly accessible land adjacent to land required for the construction of the Proposed Scheme. These observational survey visits were completed on 2 December 2020, 16 December 2020 and 28 January 2021, respectively.

### 5.2 Deviations, constraints and limitations

- 5.2.1 Survey in accordance with the FSMS protocol was not possible due to access constraints and this is a significant limitation to the assessment of ecological impacts. Observational survey visits were completed using publicly accessible land adjacent to land required for the construction of the Proposed Scheme with the aim to reduce this limitation.

### 5.3 Baseline

- 5.3.1 The desk study identified records of 85 bird species within 5km of land required for the construction of the Proposed Scheme since 2009. Within 5km, there are 21 records of Schedule 1 species<sup>11</sup> of the Wildlife and Countryside Act 1981 (as amended), and records for species of conservation concern<sup>12</sup>, including 29 species on the Red List<sup>13</sup> and 44 species on the Amber List<sup>14</sup>.
- 5.3.2 The desk study data includes 25 species records from 1km squares adjacent to, or spanning, land required for construction of the Proposed Scheme. None of the species are listed on Schedule 1 of the Wildlife and Countryside Act 1981. The records include 12 species on the Red List and 13 species on the Amber List.

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<sup>11</sup> Wildlife and Countryside Act (1981), Schedule 1. Available online at: <https://www.legislation.gov.uk/ukpga/1981/69/schedule/1>.

<sup>12</sup> Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. and Gregory R.D. (2015), *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds, 108, P708-746.

<sup>13</sup> Red List criteria for breeding birds are those species which have experienced a severe decline of more than 50% of population and / or range over the last 25 years.

<sup>14</sup> Amber List criteria for breeding birds are those species which have experienced a moderate decline of between 25% and 49% of population and / or range over the last 25 years.

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5.3.3 Three observational surveys during December 2020 and January 2021 recorded 20 species adjacent to, or flying over, land required for construction of the Proposed Scheme. These species included: blackbird (*Turdus merula*), black-headed gull (*Chroicocephalus ridibundus*), blue tit (*Cyanistes caeruleus*), buzzard (*Buteo buteo*), carrion crow (*Corvus corone*), chaffinch (*Fringilla coelebs*), common gull (*Larus canus*), dunnock (*Prunella modularis*), fieldfare, goldfinch (*Carduelis carduelis*), great tit (*Parus major*), herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), jackdaw (*Corvus monedula*), kestrel (*Falco tinnunculus*), robin (*Erithacus rubecula*), rook (*Corvus frugilegus*), starling (*Sturnus vulgaris*), tree sparrow (*Passer montanus*), and woodpigeon (*Columba palumbus*).

## **6 Otter**

### **6.1 Methodology**

- 6.1.1 Desktop otter records have been obtained within 5km of the land required for the construction of the Proposed Scheme from third party data.

### **6.2 Deviations, constraints and limitations**

- 6.2.1 Survey in accordance with the FSMS protocol was not possible and this is a significant limitation to the assessment of ecological impacts.

### **6.3 Baseline**

- 6.3.1 The desk study indicates the presence of otter within the same river catchment at Kirtle Water and the River Sark. Records were provided for otter located along Kirtle Water (south-west of Gretna), the River Sark (near Moss Side), and at the B7076 Roman Road near The Bracken.

## 7 Bats

### 7.1 Methodology

- 7.1.1 Desktop bat records have been obtained within 5km of the land required for the construction of the Proposed Scheme from SWSEIC.

### 7.2 Deviations, constraints and limitations

- 7.2.1 Survey in accordance with the FSMS protocol was not possible and this is a significant limitation to the assessment of ecological impacts.

### 7.3 Baseline

- 7.3.1 There are no statutory designated sites (within 10km) or non-statutory designated sites (within 5km) of land required for the Proposed Scheme which include bats as features for their designations.
- 7.3.2 Habitats within land required for the construction of the Proposed Scheme suitable to support roosting, foraging and commuting bats includes broad-leaved woodland, marshy grassland, hedgerows and the Ewes Burn. The majority of these habitats are located within and adjacent to the land required for the construction of the Proposed Scheme.
- 7.3.3 Desk study records recorded at least three species of bats within 5km of the Proposed Scheme:
- Pipistrelle species (*Pipistrellus* sp.);
  - Soprano pipistrelle (*Pipistrellus pygmaeus*);
  - Brown long-eared bat (*Plecotus auritus*); and
  - Brandt's bat (*Myotis brandtii*) or whiskered bat (*Myotis mystacinus*).



## **8 Aquatic invertebrates**

### **8.1 Methodology**

- 8.1.1 Desk study records relating to aquatic invertebrates for the land required for the construction of the Proposed Scheme were obtained from SWSEIC. In addition, the Water Classification Hub was accessed to understand the current surface water status of the River Kirtle catchment<sup>8</sup>.

### **8.2 Deviations, constraints and limitations**

- 8.2.1 Survey in accordance with the FSMS protocol was not possible and this is a significant limitation to the assessment of ecological impacts.

### **8.3 Baseline**

- 8.3.1 One small watercourse is present within the land required for construction of the Proposed Scheme; the Ewes Burn which is hydrologically connected to Kirtle Water. The combined biological elements score of Kirtle Water is poor, with invertebrate measures collectively achieving a score of good<sup>8</sup>. There are no desk study records of aquatic invertebrates within the search area.

## 9 Fish

### 9.1 Methodology

- 9.1.1 Desk study records relating to fish within land required for the construction of the Proposed Scheme were obtained from SWSEIC.

### 9.2 Deviations, constraints and limitations

- 9.2.1 Survey in accordance with the FSMS protocol was not possible and this is a significant limitation to the assessment of ecological impacts<sup>8</sup>.

### 9.3 Baseline

- 9.3.1 One small watercourse is present within the land required for construction of the Proposed Scheme; the Ewes Burn, which flows into Kirtle Water. The combined biological elements score of Kirtle Water, reflecting fish and fish ecology measures is poor<sup>8</sup>.
- 9.3.2 There are no desk study records of fish in the Ewes Burn, but fish species including river and brook lamprey (*Lampetra fluviatilis* and *L. planeri*) are known to be present within the wider River Kirtle catchment<sup>15</sup>. River and brook lamprey are species of principal importance and their populations are declining across the UK. In addition, European eel (*Anguilla anguilla*), Atlantic salmon (*Salmo salar*) and brown/sea trout (*Salmo trutta*) have been recorded at the River Sark, within 5km of the land required for the Proposed Scheme. European eel is listed as critically endangered by the International Union for Conservation of Nature and is also a S41 species. Brown/sea trout and Atlantic salmon are species of principal importance and their populations are declining across the UK.

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<sup>15</sup> Hume, J.B. (2017), *A review of the geographic distribution, status and conservation of Scotland's lampreys*. The Glasgow Naturalist (online 2017), Volume 26, Part 4. Available online at: [https://www.glasgownaturalhistory.org.uk/gn26\\_4/Hume\\_lampreys\\_Scotland.pdf](https://www.glasgownaturalhistory.org.uk/gn26_4/Hume_lampreys_Scotland.pdf).

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