

The High Speed Rail (London – West Midlands) (Greatmoor Railway Sidings Etc.) Order

Environmental Statement – technical appendices **Volume 4.8:** Ecology baseline data, survey results and non-significant effects



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Environmental Statement – technical appendices

Volume 4.8:

Ecology baseline data, survey results
and non-significant effects



Department for Transport

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1 Introduction

- 1.1.1 This document is an appendix which forms part of the Volume 4: Environmental Statement Technical Appendices. Sections 2 and 3 describe the ecological baseline data collected for bats from trapping and radio-tracking surveys undertaken in 2015 and 2016. Section 4 describes all non-significant effects on ecological receptors identified within the baseline of the Volume 2: Main Environmental Statement (ES) during construction and operation.
- 1.1.2 The document should be read in conjunction with Volume 2: Main ES.

2 2015 Trapping and Radio-tracking surveys

2.1 Introduction

2.1.1 This section details the trapping and radio-tracking surveys conducted between May and September 2015 on the Doddershall Estate and Claydon Estate to supplement baseline data for this area.

2.2 Trapping survey

2.2.1 A total of 262 bats were caught over 36 nights of trapping between 21 May and 20 September 2015. Bats were caught at multiple locations within 18 discrete areas across the study area.

2.2.2 A total of nine species were caught comprising 17¹ Bechstein's bats, 109 brown long-eared bats, four Brandt's bats, 18 common pipistrelles, 10 Daubenton's bats, 74 Natterer's bats, six noctules, 15 soprano pipistrelles and nine whiskered bats. Table 1 shows the number of bats of all species caught at each location.

Table 1: Number of bats of all species caught at each location in 2015

Location Number	Location Description	Number of Bats Caught
1	Hedgerows adjacent to Proposed Scheme north-east of Doddershall House	4
2	Small woodland copse to north of Doddershall House	14
3	Woodland in grounds of Doddershall House and along Tetchwick Brook to south of Doddershall House	27
4	Knapps Hook Wood	8
5	Doddershall Wood	70
6	Grendon Wood	25
7	Hewin's Wood bridle path	14
8	Greatsea Wood	54
9	South Romer Wood	0
10	Northern Romer Wood	15
11	Sheephouse Wood	3

¹ A further three female Bechstein's bats were caught by the North Buckinghamshire Bat Group in Finemere Wood.

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Location Number	Location Description	Number of Bats Caught
12	Sheephouse Wood	8
13	Sheephouse Wood	4
14	Shrubs Wood	6
15	Decoypond Wood	4
16	Shrubs Wood	0
17	Hedgerows adjacent to Proposed Scheme east of Upper South Farm	4
18	Hedgerows adjacent to disused railway north of Railway Cottage	2

2.3 Radio-tracking survey

2.3.1 Of the 262 bats caught 31 were selected for radio-tagging from six species. The details of the radio-tagged bats are shown in Table 2.

Table 2: The number of roosts located and number of nights radio-tracked for each bat in 2015

Bat	Species	Date Caught	No of roosts used in tracking period.	No of nights radio-tracked
1	Bechstein's bat	15/05/2015	2	3
2	Bechstein's bat	15/05/2015	1	3
3	Bechstein's bat	21/05/2015	2	3
4	Brown long-eared	21/05/2015	2	2
5	Natterer's bat	21/05/2015	2	5
6	Bechstein's bat	22/05/2015	3	4
7	Bechstein's bat	22/05/2015	2	4
8	Bechstein's bat	23/05/2015	1	3
9	Bechstein's bat	13/07/2015	3	6
10	Natterer's bat	13/07/2015	1	4
11	Brandt's bat	14/07/2015	4	6
12	Bechstein's bat	17/07/2015	1	5

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Bat	Species	Date Caught	No of roosts used in tracking period.	No of nights radio-tracked
13	Whiskered bat	18/07/2015	N/A	N/A
14	Brown long-eared	18/07/2015	2	4
15	Natterer's bat	18/07/2015	1	4
16	Whiskered bat	19/07/2015	1	2
17	Bechstein's bat	01/08/2015	1	3
18	Bechstein's bat	17/08/2015	1	5
19	Bechstein's bat	17/08/2015	4	5
20	Bechstein's bat	18/08/2015	6	5
21	Daubenton's bat	18/08/2015	N/A	N/A
22	Bechstein's bat	18/08/2015	1	5
23	Bechstein's bat	21/08/2015	N/A	N/A
24	Bechstein's bat	22/08/2015	2	3
25	Bechstein's bat	22/08/2015	2	5
26	Bechstein's bat	23/08/2015	2	3
27	Bechstein's bat	23/08/2015	2	2
28	Natterer's bat	15/09/2015	4	8
29	Bechstein's bat	15/09/2015	2	8
30	Daubenton's bat	17/09/2015	N/A	N/A
31	Bechstein's bat	19/09/2015	4	5

2.3.2 Of the 31 radio-tagged bats a total of 36 roosts were identified for bats 1 to 31. Roosts for Bats 13, 21, 24 and 30 were not located during the surveys. Details of the roost locations are shown in Table 3.

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Table 3: The roost locations and distance from the Proposed Scheme in 2015

Bat number	Species	Roost Location	Roost grid reference	Approximate distance from land required for construction of the Proposed Scheme (m)
3	Bechstein's bat	Doddershall Wood	SP 70059 20199	875m - west
3	Bechstein's bat	Doddershall Wood	SP 70143 20267	810m - west
6	Bechstein's bat	Doddershall Wood	SP 70228 20369	750m - west
8	Bechstein's bat	Grendon Wood	SP 69989 21388	955m - south-west
9	Bechstein's bat	Doddershall Wood	SP 69952 20331	1km - west
9	Bechstein's bat	Knapps Hook Farm	SP 70835 20126	105m - west
17	Bechstein's bat	Field west of Finemere Wood	SP 71309 22268	35m - east
18	Bechstein's bat	Grendon Wood	SP 69989 21388	955m - south-west
20	Bechstein's bat	Doddershall Wood	SP 70263 20182	675m - west
22	Bechstein's bat	Ham Home Wood	SP 69231 19166	1.45km - west
24	Bechstein's bat	Oving Hill Farm	SP 70450 20512	565m - west
24	Bechstein's bat	Doddershall Wood	SP 70321 20238	630m - west
26	Bechstein's bat	Finemere Wood	SP 71312 22058	50m - east
27	Bechstein's bat	Finemere Wood	SP 71598 22143	345m - east
27	Bechstein's bat	Finemere Wood	SP 71966 22005	705m - north-east

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Bat number	Species	Roost Location	Roost grid reference	Approximate distance from land required for construction of the Proposed Scheme (m)
28	Bechstein's bat	Finemere Wood	SP 71362 22073	100m - north-east
29	Bechstein's bat	West of Manor Farm, Grendon Underwood	SP 67445 21186	3.2km - south-west
31	Bechstein's bat	Finemere Wood	SP 71526 22000	275m - east
4	Brown long-eared	Doddershall Wood	SP 70300 20213	645m - west
4	Brown long-eared	Knapps Hook Farm	SP 70691 20095	240m - west
14	Brown long-eared	Catherine Farm, north of Home Wood	SP 71370 25075	2.2km - north
14	Brown long-eared	Home Wood	SP 71387 24550	1.75km - north
5	Natterer's bat	Lawn Farm Business Centre	SP 69808 19841	1km - west
5	Natterer's bat	Doddershall Wood	SP 70073 20434	910m - west
10	Natterer's bat	Grendon Wood	SP 69891 21414	1km - south-west
15	Natterer's bat	Home Wood	SP 71480 24426	1.7km - north
28	Natterer's bat	Sheephouse Wood	SP 70303 23307	300m - west
28	Natterer's bat	Sheephouse Wood	SP 70501 23086	80m - west
28	Natterer's bat	Land north of Hewin's Wood	SP 70631 21973	95m - south
28	Natterer's bat	Finemere Wood	SP 71460 21866	260m - north-east
28	Natterer's bat	Woodlands Farm	SP 71476 21290	280m - south
16	Whiskered bat	Home Wood	SP 71336 24143	1.4km - north
11	Brandt's bat	Grendon Wood	SP 69956 21180	1.1km - south-west

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Bat number	Species	Roost Location	Roost grid reference	Approximate distance from land required for construction of the Proposed Scheme (m)
11	Brandt's bat	Finemerehill House	SP 71502 22337	180m - east
11	Brandt's bat	Finemere Wood	SP 71789 22111	530m - east
11	Brandt's bat	Finemere Wood	SP 72008 21854	700m - east

3 2016 Trapping and Radio-tracking surveys

3.1 Introduction

3.1.1 This section details the trapping and radio-tracking surveys conducted during May 2016 on the Claydon Estate to supplement baseline data for this area.

3.2 Trapping survey

3.2.1 A total of 37 bats were caught over 5 nights of trapping between 11 May and 17 May 2016. Bats were caught at multiple locations within 17 discrete areas across the study area.

3.2.2 A total of eight species were caught comprising two Bechstein's, four Brandt's bat, nine brown long-eared bats, two common pipistrelles, two Daubenton's bats, 11 Natterer's bats, four soprano pipistrelle bats and three whiskered bats. DNA samples of small *Myotis* were collected to confirm identification. The number of bats of all species caught at each location is shown Table 4 below.

Table 4: Number of bats of all species caught at each location in 2016

Location Number	Location Description and coordinates	Number of Bats Caught
1	North-east of Shrubs Wood	0
2	South-west of Shrubs Wood	0
3	North-west of Decoypond Wood	0
4	North-east of Decoypond Wood	0
5	South-west of Decoypond Wood	0
6	South-east of Decoypond Wood	5
7	North-west of Sheephouse Wood	1
8	North-east of Sheephouse Wood	2
9	Centre of Sheephouse Wood	0
10	East of Sheephouse Wood	0
11	South of Sheephouse Wood	0
12	North-west of Home Wood	4
13	North of Home Wood	2

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Location Number	Location Description and coordinates	Number of Bats Caught
14	East of Home Wood	0
15	Centre of Home Wood	2
16	South-west of Home Wood	2
17	North-east of Romer Wood	1
18	North of Romer Wood	2
19	North of Greatsea Wood	0
20	East of Greatsea Wood	0
21	South of Greatsea and Romer woods	0
22	Copse South of Balmore Wood	1
23	North of Balmore Wood	0
24	North-east of Balmore Wood	5
25	North of Runts Wood	5
26	East of Runts Wood	3

3.3 Radio-tracking survey

3.3.1 Of the 37 bats caught nine were selected for radio-tagging from six species. The details of the radio-tagged bats are shown in Table 5.

Table 5: The number of roosts located and number of nights radio-tracked for each bat in 2016

Bat number	Species	Biological name	Date Caught	No of roosts used in tracking period	No of nights radio-tracked
1	Daubenton's bat	<i>Myotis daubentonii</i>	11/05/16	1	3
2	Natterer's bat	<i>Myotis nattereri</i>	13/05/16	1	3
3	Brandt's bat	<i>Myotis brandtii</i>	13/05/16	1	3
4	Brown long-eared bat	<i>Plecotus auritus</i>	14/05/16	1	6
5	Brandt's bat	<i>Myotis brandtii</i>	15/05/16	1	5

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Bat number	Species	Biological name	Date Caught	No of roosts used in tracking period	No of nights radio-tracked
6	Whiskered bat	<i>Myotis mystacinus</i>	15/05/16	1	3
7	Bechstein's bat	<i>Myotis bechsteinii</i>	15/05/16	1	4
8	Natterer's bat	<i>Myotis nattereri</i>	17/05/16	1	3
9	Bechstein's bat	<i>Myotis bechsteinii</i>	17/05/16	0	3

3.3.2 Of the nine radio-tagged bats a total of eight roosts were identified for bats 1 to 8. Bat 9's roost was not located during the surveys. Details of the roost locations are shown in Table 6.

Table 6: The roost locations and distance from the Proposed Scheme in 2016

Bat number	Species	Roost Location	Roost grid reference	Approximate distance from land required for construction of the Proposed Scheme (m)
1	Daubenton's bat	South-east of Shrubs Wood	SP 69818 24411	1.5km - north-west
2	Natterer's bat	Claydon House	SP 71930 25331	2.8km - north
3	Brandt's bat	Woodlands Farm	SP 71446 21302	1.2km - south-west
4	Brown long-eared bat	North-east of Greatsea Wood	SP 71554 22964	950m - north-east
5	Brandt's bat	Orchard Way, Botolph Claydon	SP 73240 24527	3.25km - north-west
6	Whiskered bat	South of Bernwood Jubilee, East Claydon	SP 73469 25526	4.1km - north
7	Bechstein's bat	East of Runt's Wood	SP 72692 22916	1.9 km - east
8	Natterer's bat	North-east of Sheephouse Wood	SP 70430 23580	700m - north

4 Non-significant ecological effects

Table 7: Summary of all non-significant effects arising from the construction of the Proposed Scheme

Designated site, habitat, species or species group	Receptor/location	Description of assessment
Designated site	Ham Home-cum-Hamgreen Woods SSSI	The air quality assessment for Ham Home-cum-Hamgreen Woods SSSI (see Volume 2, Section 6 Air Quality) concluded that there would be a negligible impact of nitrogen deposition from traffic vehicles during construction of the Proposed Scheme, but potentially significant impacts of NO _x deposition due to construction traffic on the A41 at a distance of 0 to 10m into the woodland habitat. However, these impacts are considered to be marginal and temporary, and therefore not likely to have a significant effect given their limited duration.
Habitat	Woodland (including ancient woodland)	<p>The majority of woodland in close proximity to the Proposed Scheme is present at Grendon and Doddershall Woods SSSI, Sheephouse Wood SSSI and Finemere Wood SSSI. Adverse effects from airborne pollution on these areas of woodland is unlikely to occur. The woodland at Ham Home-cum-Hamgreen Woods SSSI adjacent to the A41 Bicester Road, which will be used by construction traffic, is also relevant to the assessment. With the exception of the potentially significant impacts of NO_x deposition at a distance of 0 to 10m into the woodland habitat at Ham Home-cum-Hamgreen Woods SSSI. However, as described above, these impacts are considered to be temporary, and therefore not likely to have a significant effect given their limited duration. As such, construction of the Proposed Scheme would have no significant effects on the conservation status of this habitat.</p> <p>No significant adverse effects are predicted at other ancient woodland that are designated as a Local Wildlife Site at Greatsea and Romer Wood, or at Hewin's Wood, which is not covered by any site designation</p>
Habitat	Broadleaved woodland - semi-natural	The land required for the construction of the Proposed Scheme includes approximately 1.80ha of semi-natural broadleaved woodland (of which 1.73ha will be removed by the HS2 Phase One scheme).
Habitat	Semi-improved neutral grassland present along the south-western margin of BBOWT's Finemere Wood Nature Reserve	The construction of the reception sidings of the Proposed Scheme will occupy approximately 2.1ha of this habitat of which 1.65ha will be removed by the HS2 Phase One scheme. This additional loss of 0.45ha represents approximately 1.6% of the total area of approximately 29ha of grassland habitat at the nature reserve. Due to the location and extent of habitat loss, the effects on the conservation status of this area of semi-improved grassland in this area are not significant.
Habitat	Scrub	The land required for the construction of the Proposed Scheme includes approximately 6.53ha scrub (of which 4.31ha will be removed by the HS2 Phase One scheme).
Habitat	Watercourse - Muxwell Brook	The Muxwell Brook is approximately 30 m north of the land required for the Proposed Scheme. There will be no significant effects due to shading by the operational sidings embankment due to the scale of this structure (approximately 2-3 m above existing ground level) and its distance from this watercourse, and because there is shade from existing tree cover. Any adverse effects from siltation or waterborne pollution will be addressed by the implementation of the draft CoCP. The Proposed Scheme will involve

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Designated site, habitat, species or species group	Receptor/location	Description of assessment
		the diversion or increase the extent of culverting of a number of intermittently flowing drains. This will not affect the conservation status of this habitat as it is widespread locally.
Habitat	Hedgerow	Field margins within the area of the Proposed Scheme include approximately 130 m of native hedgerow. However, the HS2 Phase One scheme proposes to remove the hedgerow in 2017 in order to establish a vegetation management zone. Therefore, the Proposed Scheme has no significant effect on this habitat.
Habitat	Arable land and associated field margins	The majority of land required for the construction of the operational sidings comprises approximately 15.52ha of arable land (of which 4.18ha will be removed by the HS2 Phase One scheme). This includes 0.1ha of associated arable field margin, comprising species-poor neutral grassland, which is a habitat of principal importance. This habitat is widespread in the vicinity of the Proposed Scheme and due to the small scale of habitat loss, there would be no significant effect.
Species group	Terrestrial invertebrates	The terrestrial invertebrate assemblage present in Sheephouse Wood SSSI and nearby colonies of black hairstreak, brown hairstreak, dingy skipper and grizzled skipper could be affected by dust deposition. However, as described in Volume 2, Section 6 Air Quality, no potentially significant adverse effects on woodland habitat are expected. Water bowsers will be regularly deployed to minimise dust generation by earth moving plant. Therefore significant adverse effects on these species are unlikely to occur.
Species group	Aquatic invertebrates	Input of water borne pollution and silt deposition could result in adverse effects on the assemblage of aquatic invertebrates in the Mega Ditch. The implementation of the draft CoCP is likely to reduce such effects to a level that is not significant.
Species group	Breeding birds	<p>The Proposed Scheme will be constructed between June 2017 and September 2019. The levels of noise and vibration will be higher when construction works are taking place during this period. This may cause disturbance to the assemblage of breeding birds that form a reason for designation of Sheephouse Wood SSSI.</p> <p>The construction of the Proposed Scheme will take place in the latter part of the bird breeding season in 2017, and through the breeding season in 2018 and 2019. Works proposed in 2017/18 are largely associated with construction of the GUN/28 accommodation green overbridge and Bridleway and QUA/36 accommodation green overbridge, which are at least 650m from Sheephouse Wood SSSI. The works during the 2018 and 2019 breeding season are largely associated with the operational sidings embankment that is 30m from the southern boundary of the Sheephouse Wood SSSI at its closest point. However, the sidings are aligned away from the site, meaning that most construction activity will be at a greater distance. Therefore, the potential for breeding birds to be disturbed is limited by the location of construction activities in relation to the Sheephouse Wood SSSI, and their duration. This will result in a temporary impact on the bird assemblage at the southern end of Sheephouse Wood SSSI during the 2018 and 2019 breeding seasons, but it is considered that this will not result in a significant adverse effect on the conservation status of the affected populations within the assemblage.</p>

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Designated site, habitat, species or species group	Receptor/location	Description of assessment
Species	Barn owl	Construction of the Bridleway QUA/36/2 accommodation green overbridge will occur approximately 100m north of a confirmed barn owl nest site at Woodlands Farm. The availability of suitable nest sites, low levels of disturbance and the extent of foraging habitat are factors that are important to the maintenance of the conservation status of this species. Construction will take place for one year from June 2017 and so is likely to disrupt two breeding seasons, but birds would reoccupy this nest site in subsequent years. Approximately 0.65ha of grassland and 0.15ha of scrub that is likely to form part of the foraging resource of this breeding barn owl pair will also be removed. The extent of habitat loss is limited and there is sufficient habitat in the vicinity of the nest site to allow successful breeding, and the nest site will be retained. As a result, construction of the Proposed Scheme will not result in a significant adverse effect on the conservation status of the affected population of barn owl.
Species group	Reptiles	Construction of the Proposed Scheme will result in the loss of habitat associated with the assemblage of common reptiles near the existing Aylesbury Link railway line, Woodlands Farm and Oak Tree Farm. The conservation status of reptiles depends on the maintenance and extent of connectivity of habitat and limiting disturbance levels. Construction will result in the loss of terrestrial habitat comprising 1.22ha of scrub and 0.65ha of semi-improved grassland adjacent to the Aylesbury Link railway line. This limited loss of habitat will not result in a significant effect on the conservation status of the reptile assemblage due to the availability of suitable habitat in the surrounding landscape.
Species	Otter	The quality of the habitat for otter in the vicinity of the Proposed Scheme is poor and recorded activity is concentrated on watercourses and waterbodies to the north and south of the land required, notably along the River Ray and at Calvert Jubilee Nature Reserve LWS. Therefore, following implementation of measures in the draft CoCP to minimise the risk of disturbance to otter during construction, the Proposed Scheme will not have a significant adverse effect on the conservation status of the otter population in this area.
Species	Badger	The construction of the Proposed Scheme will not remove any badger setts and none are likely to be affected by construction activities. Nor will it remove significant areas of foraging habitat. Consequently there will be no adverse effects on the conservation status of the badger populations in this area.

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Table 8: Summary of all non-significant effects arising from the operation of the Proposed Scheme

Designated site, habitat, species or species group	Receptor/location	Description of assessment
Species group	Aquatic invertebrates	Input of water borne pollution and silt deposition to the Muxwell Brook could result in adverse effects on the assemblage of aquatic invertebrates in the Muxwell Brook, but it is assumed that such affects will be avoided by FCC's environmental management procedures. Therefore significant adverse effects on the species within the assemblage are unlikely to occur.

