A46 Coventry Junctions (Walsgrave)
Scheme Number: TR010066

6.3 Environmental Statement Appendices

Appendix 8.1 Biodiversity Net Gain Report

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A46 Coventry Junctions (Walsgrave) Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT APPENDICES
Appendix 8.1 Biodiversity Net Gain Report

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010066
Application Document Reference	TR010066/APP/6.3
Author	A46 Coventry Junctions (Walsgrave) Project Team, National Highways

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Rev 0	November 2024	Application Issue

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1. Introduction

1.1.1. National Highways (the Applicant) has applied for a development consent order (DCO) for the A46 Coventry Junction (Walsgrave) (the Scheme). The Scheme will ease congestion along the A46 corridor, east of Coventry. The proposed works include an alteration to the existing A46 Walsgrave Junction and B4082, east of Walsgrave.

1.2. Scheme location

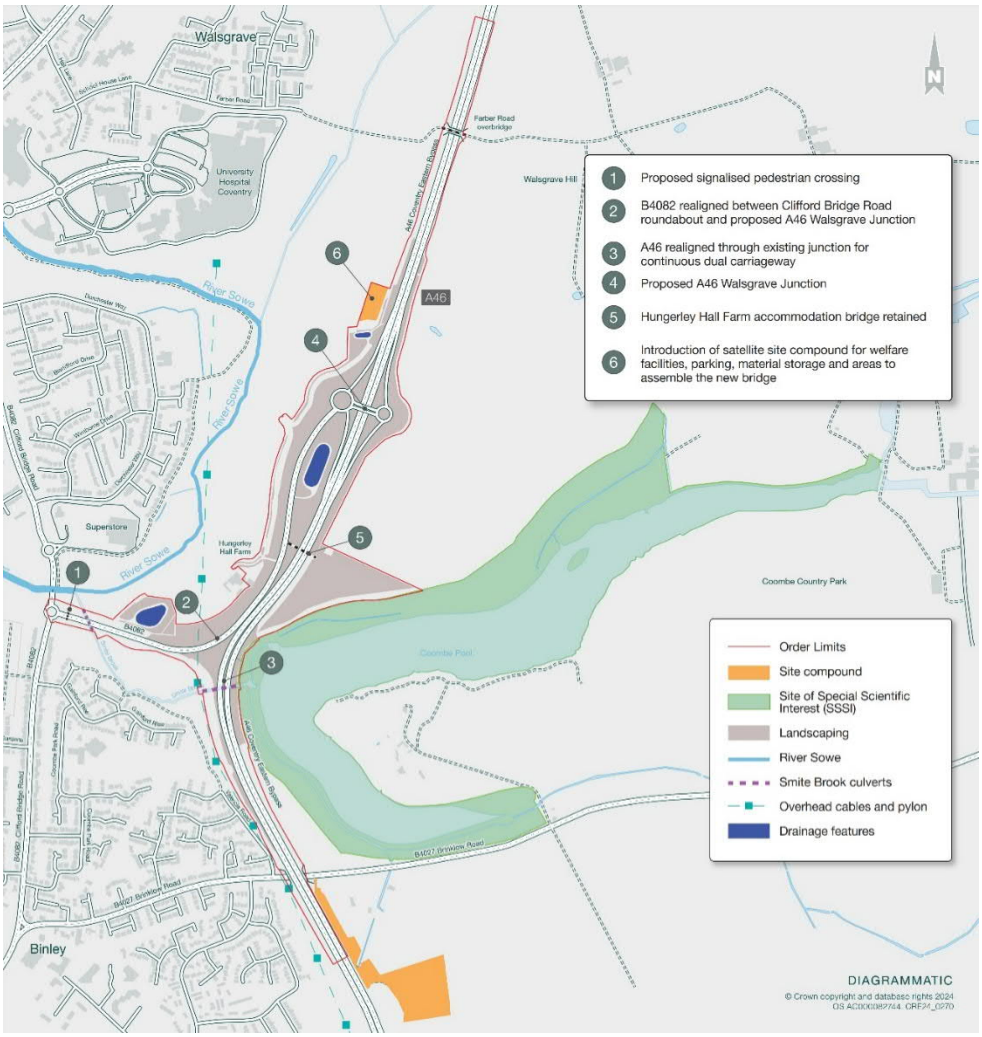
1.2.1. The Scheme is located in the West Midlands, approximately 5km to the east of Coventry city centre. ES Figure 2.1 (Location Plan) (**TR010066/APP/6.2**) shows the location of the Scheme. The Scheme involves improvements to the B4082 which runs eastwards from Clifford Bridge Road to the existing Walsgrave Junction and the A46 which runs north-south to the east of Coventry. Binley Junction, located on the A46, is approximately 1.7km to the south of the existing Walsgrave Junction and the M6 and M69 junctions are approximately 2.5km to the north of the existing Walsgrave Junction. ES Figure 2.2 (Order Limits) (**TR010066/APP/6.2**) shows the principal elements of the Scheme and the Order Limits. A Location Plan (**TR010066/APP/2.1**) is also provided with the application, which shows the location of the Scheme in its wider geographical context.

1.2.2. The Scheme is situated within the Coventry City Council and Rugby Borough Council administrative areas (ES Figure 1.1 (Regional Context) (**TR010066/APP/6.2**)). The boundary between these two administrative areas is along the western side of the A46. Rugby Borough Council's administrative area also forms part of Warwickshire County Council's administrative area, which shares the same border with Coventry City Council. The Leicestershire County Council boundary is approximately 12.5km north and east of the existing Walsgrave Junction.

1.3. Scheme overview

1.3.1. The current configuration consists of the existing A46 dual carriageway, the Walsgrave Junction and the B4082 link road; a two-lane single carriageway between the existing Walsgrave Junction and Clifford Bridge Road roundabout. The Order Limits of the Scheme is shown in Figure 1.1 below.

Figure 1.1: Scheme location plan



1.3.2. An explanation of the Scheme objectives and a detailed description of the Scheme proposals can be found in ES Chapter 2 (The Scheme) (**TR010066/APP/6.1**).

1.3.3. The Scheme consists of the following principal elements:

- Realignment of the existing A46 dual carriageway through the existing at grade roundabout (which will be removed), for approximately 880m to improve the road geometry and allow for a 50mph speed limit.
- Earthworks on the eastern side of the A46 mainline to facilitate the realignment through the existing at grade roundabout.
- A new grade separated junction over the A46 mainline, approximately 800m north of the existing Walsgrave Junction to connect the B4082 with the A46.
- A new overbridge structure across the existing A46, between the dumbbell roundabouts forming the grade separated junction.

- New merge and diverge slip roads at the grade separated junction for both northbound and southbound movements.
- Realignment of the B4082 to form a single carriageway link road, for approximately 900m, to connect the local road network to the new A46 grade separated junction with a proposed 40mph speed limit.
- Road assets and street furniture such as traffic signs and lines, variable message sign, street lighting columns, vehicle restraint systems, fences, retaining walls and kerbs.
- Drainage systems including a dry detention basin and two ponds that will be designed to be permanently wet.
- Proposed new maintenance accesses to the drainage features and variable message sign.
- Retention of the Hungerley Hall Farm accommodation overbridge (the existing bridge that provides farm vehicle access over the A46 mainline).
- Farm access track to the north of Hungerly Hall Farm to provide gated access to the B4082 link road.
- Improvements to facilities for walkers, cyclists and horse-riders (WCH) through provision of a signalised pedestrian crossing on the B4082; and providing enabling works, including the retention of Hungerley Hall Farm accommodation overbridge, for a potential future WCH route to be provided by others.
- Replacement and installation of new highway boundary fencing.
- Replacement vegetation planting to compensate for the vegetation that needs to be removed to facilitate the Scheme.

1.4. Site description

1.4.1. The Scheme has completed the preliminary design stage. The UK habitat classifications (UKHab) survey and ecological baseline calculations detailed within this report were undertaken based upon the Order Limits for the Development Consent Order (DCO) application.

1.4.2. The Order Limits, hereafter referred to as ‘the site’, comprises an area of approximately 36.57ha including 7.75ha of developed, sealed surface land (including the A46 and B4082) and 28.82ha of natural and semi-natural habitat located to the east of Coventry and is presented in Figure 1 in Appendix A.

1.4.3. The habitats within the site include woodland, scrub, arable farmland and hedgerows.

1.5. Previous surveys

1.5.1. In 2020 a Preliminary Ecological Appraisal (PEA) was undertaken comprising a Phase 1 habitat survey, which took into account the three route options being considered in the Option Selection Stage (Highways England, 2020).

1.5.2. In August 2021, a Biodiversity Net Gain (BNG) assessment was undertaken by National Highways at the Option Selection Stage in accordance with the Biodiversity Metric 2.0.

1.6. Purpose

1.6.1. This UKHab and BNG report has been prepared for National Highways and will be used to assess the Scheme against National Highways Key Performance Indicators (KPIs). As a Nationally Significant Infrastructure Project (NSIP) submitting a DCO application in late 2024 the Scheme is not subject to mandatory BNG under the Environment Act 2021, which is due to come into force for NSIPs in November 2025. The Scheme is a transition scheme sitting within the Road Investment Strategy 2 (RIS2) period (2020 – 2025) and as such National Highways have set the following KPIs for the Scheme relating to BNG:

- Delivery of a 10% net gain for area-based habitats
- Delivery of a 10% net gain for linear-hedgerow habitats

1.6.2. There is no KPI set by National Highways regarding linear watercourse habitats. However, the baseline and projected post-construction biodiversity units for linear watercourses have been calculated and presented herein to provide a complete and transparent picture of the change in biodiversity due to the Scheme.

1.6.3. Following liaison with the National Highways KPI team1, it is understood that the Scheme is not required to meet the trading standards which are built into the Metric. The exception to this would be where the ES is reporting a significant effect upon any habitats not meeting the trading standards and where further habitat creation and or enhancement would be required to sufficiently mitigate and avoid a significant effect.

1.6.4. The purpose of this report is to detail the BNG calculations undertaken for the Scheme, based upon Environmental Masterplan for the DCO application, within the latest version of Defra's Statutory Biodiversity Metric (2024), hereafter referred to as the 'Statutory Biodiversity Metric'. This report updates previous versions that were undertaken based on previous iterations of the landscape plans to inform design and the quarterly National Highways Collaborative Project Framework (CPF) assessment submissions.

[1] This was confirmed via a Teams meeting on 25 July 2024 and a follow up email.

2. Methodology

2.1. UKHAB survey

2.1.1. A UKHab survey (UKHab Ltd, 2023) was undertaken on 15 to 17 June, 27 July, 25 August 2022 and 4 May 2023 to classify the habitats within the site in accordance with the UKHab methodology to inform the baseline for the BNG calculations and future assessments. Weather conditions at the time of each survey were dry and sunny.

2.1.2. All accessible areas within the site were subject to full survey for habitats and each habitat's condition was assessed in accordance with the Biodiversity Metric 4.0 and updated in accordance with the Statutory Biodiversity Metric following its publication on 29 November 2023. Guidance (Defra, 2024) states that any version of the Statutory Metric can be used as updates would not affect the unit outputs.

2.1.3. UKHab classifies habitats in a primary habitat hierarchy consisting of five levels. Level two provides a broad habitat type (e.g. grassland or woodland) and levels beyond this increase habitat specificity. A list of plant species was compiled in accordance with methodology required to establish UKHab types up to level 4. Level 5 was recorded wherever possible, with care to accurately record all habitats of priority importance (if present). Secondary codes were added to polygons where deemed appropriate, taking special care to map mandatory codes for habitat mosaic, complex and origin. Survey was undertaken at the fine scale minimum mapping unit (MMU) of 25m² (polygons) and 1m width/5m long (lines). Key ecological features below the MMU in either area or length were mapped as points.

2.2. River Condition Assessment

2.2.1. The river condition assessment (RCA) survey is to assess the habitat and morphological quality of rivers to inform BNG assessments. RCA consists of a field survey and a desk-based study. The field survey, the Modular River Physical (MoRPh) survey, produces a preliminary condition score irrespective of river type. The desk-based 'river type' study uses bed material data from the MoRPh survey and determines the river type which is required to classify a final condition score.

Scoping

2.2.2. In accordance with the latest version of Defra's Statutory Biodiversity Metric User Guide (Defra, 2024), the sections of Smite Brook scoped into this assessment include those within the Order Limits and those sections where the Order Limits is present within the riparian zone (10m from the watercourse bank tops) and includes:

- A 15m section east of the A46 culvert within the Order Limits
- The 81m culverted section beneath the A46 within the Order Limits
- An 18m section west of the A46 culvert within the Order Limits
- A 21m section south of the B4082 where the Order Limits comes within 2m of the banks
- A 19m section south of the B4082 culvert within the Order Limits
- The 20m culverted section beneath the B4082 within the Order Limits
- A 23m section north of the B4082 culvert within the Order Limits

MoRPh survey

2.2.3. A MoRPh survey forms part of the RCA which is used to assess the baseline and predict post-development condition of rivers, streams and canals. The MoRPh survey includes surveying a pre-defined stretch of watercourse, relative to the width of the watercourse, and recording survey information and channel dimensions in addition to features on the bank top, bank face and channel margin and within the channel.

2.2.4. This is assessed using 32 condition indicators within MoRPh survey, which are either positive indicators assigned a score of 0 to +4 or negative indicators assigned a score of 0 to -4. The Preliminary Condition Score for each MoRPh5 subreach is calculated as the sum of the average positive condition indicator scores and the average of the negative condition indicator scores.

2.2.5. The MoRPh survey was undertaken on 19 and 20 June 2024 by an accredited surveyor in accordance with The MoRPh Survey Technical Reference Manual (Modular River Survey, 2022).

MoRPh module length

2.2.6. The MoRPh width of the surveyed modules of Smite Brook between Coombe Pool and the River Sowe varies between 1.5m and 15m. Based upon best judgment it is considered that the majority of the watercourse has a MoRPh width of <5m and as such a 10m module length was surveyed for each section.

River type desk study

2.2.7. Following the MoRPh survey, a desk-based river type survey was undertaken to determine the river type classification.

2.2.8. Reaches are defined as contiguous stretches of watercourse that are subject to similar boundary conditions. The ends of reaches are often defined by major tributaries (contributing >10% of the flow), artificial barriers (e.g. weirs or dams)

likely to significantly change flow or sediment movements) or distinct and persistent changes in planform.

2.2.9. In addition to use of the MoRPh data for bedrock reaches, coarsest bed material size class and average alluvial bed material size class, the river type desk-based study involves measurement of the following geometric data within the reach:

- Braiding index
- Sinuosity index
- Anabranching index
- Level of confinement
- Valley gradient

2.3. BNG calculation

2.3.1. The biodiversity calculations within this report have been produced using the Statutory Biodiversity Metric guidelines and calculator. The baseline (pre-development) habitat areas have been calculated based upon the Figure 1 in Appendix A.

2.3.2. The post development habitat areas have been calculated based upon the final ES Figure 2.4 (Environmental Masterplan) (**TR010066/APP/6.2**).

Clarifications

2.3.3. The Scheme comprises the removal of understorey shrubs within the other broadleaved woodland within Coombe Pool Site of Special Scientific Interest (SSSI) to facilitate replacement fencing works. As this is removal of the understorey only and not the entire woodland ecosystem, and the removal of the understorey would not change the condition of the woodland, the woodland habitat has been recorded as retained within the calculations.

2.3.4. At the time of this assessment no detailed management plans were provided beyond those outline plans detailed within the Outline Landscape and Ecology Management Plan (OLEMP) within ES Appendix B.4 of the First Iteration Environmental Management Plan (EMP) (**TR010066/APP/6.5**). The target condition has been selected based on species lists provided and professional judgement on likely achievable condition criteria.

2.3.5. The Scheme programme details a 22-month construction period from September 2026 to June 2028. As this is less than two years and it is anticipated that habitat creation will be started within the construction period, a 1-year delay has been applied to the post-construction habitat creation in the Metric.

2.4. Strategic significance

2.4.1. The strategic significance of habitats has been assessed in accordance with the Statutory Biodiversity Metric guidance. Strategic significance gives additional value to habitats which are either situated in a location considered optimal for ecological connectivity or are habitats which meet local biodiversity objectives.

2.4.2. The following resources have been reviewed:

- National Character Area (NCA) Arden (Natural England 2012)
- National Character Area (NCA) Dunsmore and Feldon (Natural England 2012)
- Coventry Local Plan 2017 (Coventry City Council 2017)
- Warwickshire, Coventry and Solihull (WCS) Local Biodiversity Action Plan ((LBAP) Warwickshire Wildlife Trust 2023)
- WCS Green Infrastructure (GI) Strategy (Warwickshire Museum and Natural Environment 2013) and associated mapping (Warwickshire County Council, 2023)
- Local Plan 2011-2031 GI policies map (Rugby Borough Council, 2019)

2.4.3. As the site is located within the WCS GI Strategy and the Rugby Borough Council Local Plan, the natural habitats located within the Scheme have been identified as being of high strategic significance.

2.5. Personnel

2.5.1. The UKHab survey was undertaken by Sweco Principal Ecologist MSc ACIEEM, (who has over ten years' experience in ecological consultancy), Sweco Senior Ecologist MSc ACIEEM (who has six years' experience in ecological consultancy), Sweco Senior Ecologist MSc ACIEEM (who has over seven years' experience in ecological consultancy), Sweco Ecologists and Sweco Graduate Ecologists.

2.5.2. The MoRPh survey was undertaken by an accredited surveyor and assisted by a water specialist. The reporting has been reviewed by an accredited surveyor, Principal Consultant Hydrologist, Sweco.

2.5.3. The BNG calculations have been produced by Sweco Senior Ecologist and reviewed by Sweco Principal Ecologist. This report has been produced by Sweco Ecologist, who has experience in undertaking biodiversity metric calculations for BREEAM projects and projects subject to BNG Assessments. This report has been reviewed by a Sweco Principal Ecologist and approved by Sweco National Ecology Lead (PhD MA (Cantab) BA (Hons) CEcol MCIEEM MRSB), with further amendments approved by Sweco Principal Ecologist (MRes BSc (Hons) MCIEEM).

2.6. Limitations

General survey limitations

2.6.1. Due to the nature of some habitats, particularly those with dense vegetation growth, it was not possible to access certain areas of the site during the UKHab survey. The condition assessments of these habitat parcels were therefore undertaken from their perimeter. As such, the condition assessments for these areas may not be fully representative of each habitat parcel as a whole. All inaccessible areas are mapped on Figure 1 in Appendix A.

2.6.2. Due to health and safety concerns associated with surveying the highways boundary next to a live dual carriageway, the surveys of the habitats within the highway boundary could only be undertaken at night when traffic management was in place. Whilst the traffic management allowed access to the highway boundary, much of which is woodland, the dark conditions caused limitations to the survey, as areas of differing condition may not have been visible.

RCA limitations

2.6.3. Due to the short sections of watercourse scoped into the assessment it was not possible to complete a full MoRPh5 consisting of five contiguous modules for any of the above identified sections of watercourse. It was also considered not appropriate to undertake a full MoRPh5 encompassing the scoped in sections of watercourse as the resulting condition determined would not be representative of the short sections scoped in.

2.6.4. As such the methodology described in the below subsections was adopted. Limitations are discussed in the following sections for clarity. Plates 1 – 4 show the scoped in sections of watercourse with blue lines indicating approximate MoRPh locations.

Section east of the A46 culvert

2.6.5. One 10m module was surveyed within this 15m section (see Plate 1 below). The location of the module was situated approximately within the centre of the 15m section. It was not considered appropriate to undertake a full 50m MoRPh5 starting from the A46 culvert and moving eastwards due to the presence of the pool at the confluence of Smite Brook, the Coombe Pool outfall and Birchley Beck approximately 16m east of the Order Limits. The watercourse in this scoped in section and beyond this section was significantly different in nature to that of the scoped in section of watercourse. In particular, watercourse dimensions in the pool and aquatic vegetation north of the pool, and as such a condition assessment including these sections would not have been representative of the scoped in section of watercourse.

2.6.6. This surveyed module was duplicated five times within Cartographer software to produce a representative condition score for the 15m section of watercourse.

2.6.7. The module was surveyed from the right bank only due to lack of access to the left bank.

Section west of the A46 culvert

2.6.8. Access to the scoped in section (see Plate 2 below) of watercourse was not possible due to dense vegetation on and beyond the left bank and on the right bank. Visibility of the section was poor from the corner of the agricultural field, however the general character of the section (unshaded with abundant aquatic vegetation) was visible. The module was surveyed from the right bank only due to lack of access through dense vegetation on the left bank. The bed material was not visible within the surveyed module.

2.6.9. As such, one module was surveyed from the closest location which allowed a reasonable view of the channel. The module upstream end (closest to the scoped in section) was located approximately 14m downstream of the scoped in section of watercourse and was considered representative of the scoped in section.

2.6.10. It was not considered appropriate to undertake a full 50m MoRPh5 as beyond the surveyed module the characteristics of the watercourse changed and were not representative of the scoped in section. The watercourse outside of the scoped in section was more shaded, with no aquatic vegetation and significant amounts of large wood in the channel.

2.6.11. This surveyed module was duplicated five times within Cartographer software to produce a representative condition score for the 18m section of watercourse. Bed material data was taken from a section of watercourse 20m downstream of the surveyed module as this was the closest point at which bed material could be seen.

2.6.12. One artificial bank face feature (a blocked outfall) was recorded on the right bank of the surveyed section. As this is an individual artificial feature and there is no certainty or reason to believe it would be present within the section of watercourse scoped in for which this survey is being applied to, this feature has been omitted from the duplicated modules for this subreach.

Section to the south of the B4082 outside of, but adjacent to, the Order Limits

2.6.13. Access along this 21m section (see Plate 3 below) was not possible on the right bank due to dense scrubby woodland. Access along the left bank was restricted to a stretch approximately 6m in length. One module was surveyed as only approximately 10m of the section was visible and to allow for duplication of the

results in the Cartographer software to produce a condition representative of the 21m section.

2.6.14. The module was located within a representative 10m of the section, which was accessible, or at least visible, and was approximately central in the section.

Section to the south of the B4082 within the Order Limits

2.6.15. This section of watercourse (see Plate 3 below) was inaccessible from the banks due to dense vegetation. Two modules were surveyed from the B4082 bridge, however the dataset collected for the upstream module furthest from the B4082 bridge was incomplete due to lack of visibility from the survey distance.

2.6.16. As this section of watercourse is approximately two modules in length, and the scoped in section of watercourse south of this adjacent to the Order Limits is approximately 20m in length, it was considered appropriate to submit one MoRPh5 in the Cartographer software for these two sections. The dataset used for this MoRPh5 of the approximately 40m stretch of watercourse south of the B4082 culvert included the upstream module adjacent to the culvert replicated twice and representative of this 20m section, and the single module within the section of watercourse adjacent to the Order Limits (see paragraph 2.6.11) duplicated three times. This approach is considered to capture the two differing watercourse characters within the MoRPh5.

Section to the north of the B4082

2.6.17. This section of the watercourse (see Plate 4 below) was inaccessible from the banks due to dense vegetation and the presence of a herd of cattle, including bulls, in the field on the right bank. The section was observed from the B4082 bridge however visibility was very poor.

2.6.18. A short (approximately 5m) section of the watercourse can be seen from the B4082 bridge. From a review of aerial imagery, showing a densely vegetated riparian corridor further north within the scoped in section. it is considered that this section is likely fairly uniform in most characteristics. As such, data for module one was taken from visible areas from the B4082. This module was then duplicated five times within Cartographer with individual features (i.e. large trash) and the culvert abutments not repeated through modules two to five. Any data gaps have been completed using information from module three of Smite Brook A46 to B4082 subreach B which is considered similar in characteristics. One exception to this is bank top vegetation information pertaining to taller plants (shrubs, trees etc). This has been recorded using aerial imagery. A second exception to this is bank face material and channel dimensions (bank height, MoRPh width, water width and bankfull width) which has been estimated from

photographs taken of the section during otter (*Lutra lutra*) and water vole (*Arvicola amphibius*) surveys undertaken in 2022/2023.

Plate 1: section east of the A46 culvert and approximate surveyed module (blue line)

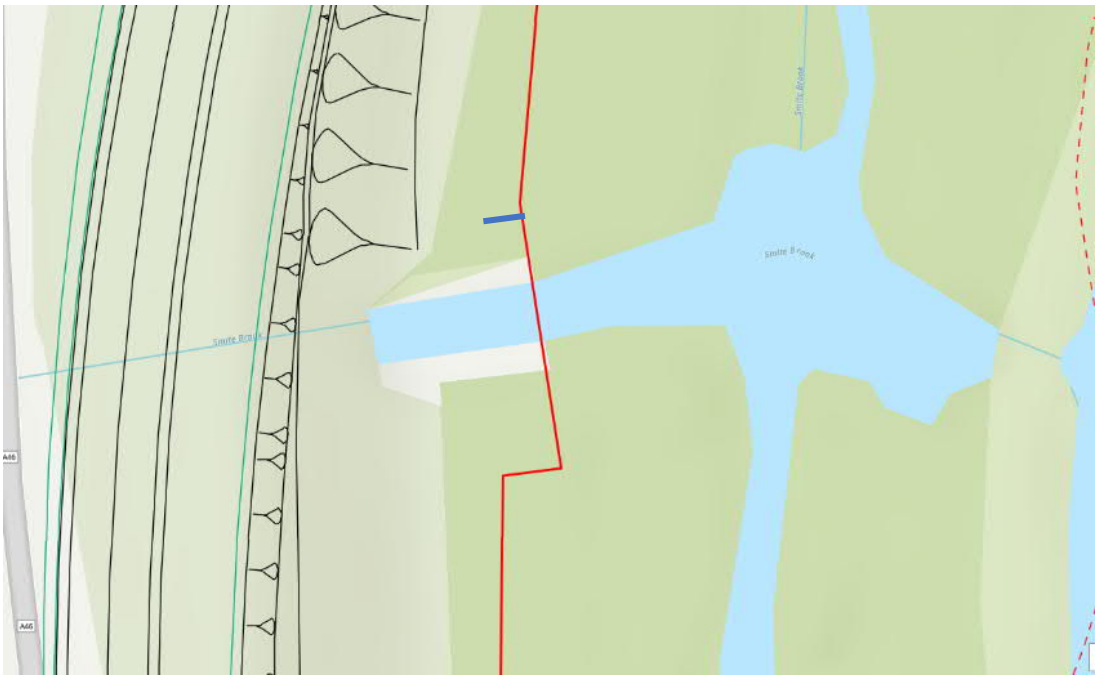


Plate 2: section west of the A46 culvert and approximate surveyed module (blue line

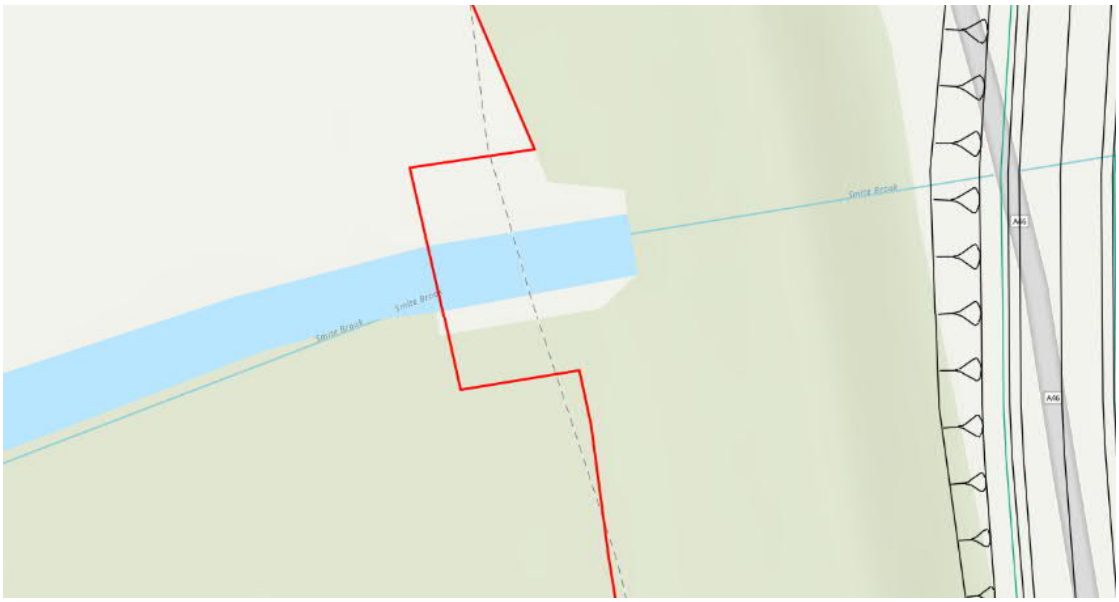


Plate 3: sections to the south of the B4082 within the Order Limits and outside of, but adjacent to, the Order Limits, showing approximate module locations (blue lines)

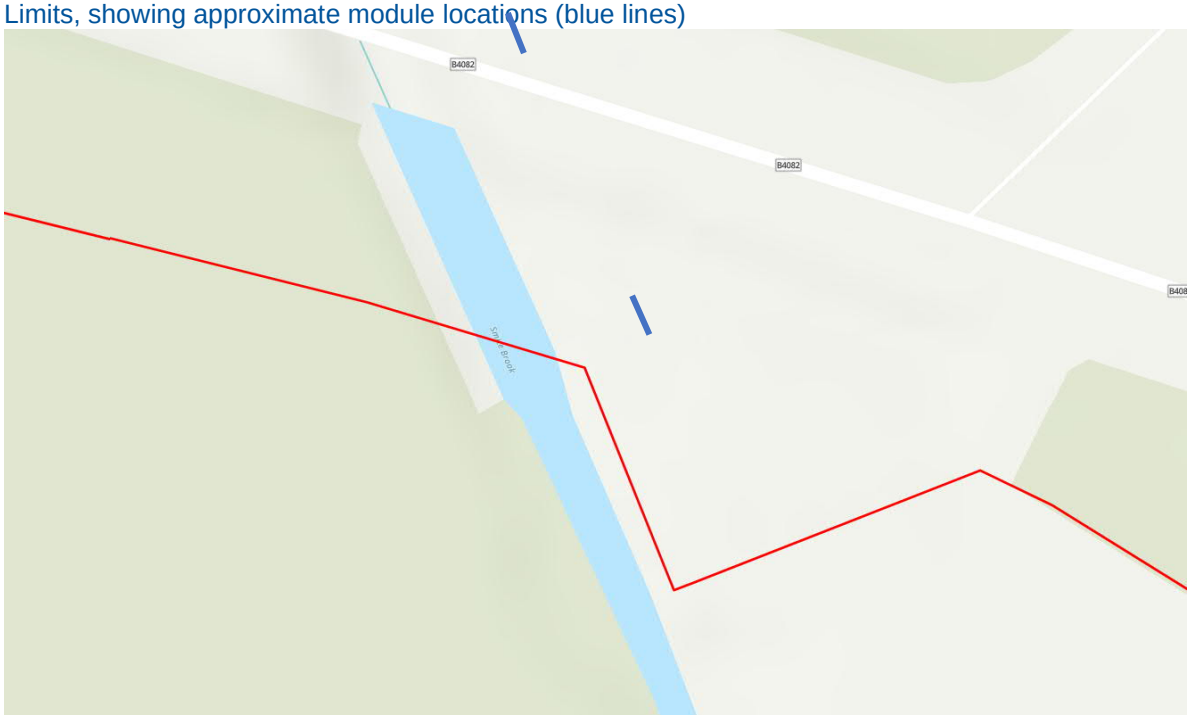


Plate 4: section north of the B4082 and approximate surveyed module location (blue line)

3. On-site UKHab and BNG baseline results

3.1. Summary of baseline habitats

3.1.1. The Metric is divided into three sections: area-based habitats, linear hedgerow habitats (hedgerows and lines of trees), and linear watercourse habitats (including rivers, streams, canals, ditches and culverts).

3.1.2. Area-based habitats identified on site include other broadleaved woodland (w1g), which makes up the majority of the highways boundary and also includes a small linear section of the woodland within Coombe Pool Site of Special Scientific Interest (SSSI), modified grassland (g4), present within small parcels on site, cereal crops (c1c), the dominant habitat outside of the highway boundary, bramble scrub (h3d) and mixed scrub (h3h), the latter two of which are present in small areas only.

3.1.3. Linear hedgerow habitats on site comprise native hedgerows (h2), including native hedgerows, native hedgerows -associated with a bank or ditch, native hedgerows with trees and native hedgerow with trees – associated with a bank or ditch. Native hedgerows (h2) are not further classified under UKHab, however are further classified as such within the Statutory Biodiversity Metric.

3.1.4. Habitats considered as linear watercourse habitats within the Statutory Biodiversity Metric consist of rivers, streams, culverts, canals and ditches. One partially culverted stream, Smite Brook, is present on and adjacent to site which required an RCA survey of which the methodology is detailed in Section 2.2.

3.1.5. For a feature to qualify as a ditch, in accordance with the Statutory Biodiversity Metric, it should be "…likely to retain water for more than 4 months of the year". As no artificial linear features meeting this criterion were identified on site no MoRPh survey is required for this habitat.

3.1.6. See Figure 1 in Appendix A for a UKHab map of the site baseline including individual area-based and linear hedgerow identifications as detailed in Tables 1 and 2 respectively, Appendix B for full condition assessments of the habitats and Appendix C for species lists.

3.2. Area-based habitats

3.2.1. Table 1 summarises the area-based baseline habitats present on site, their assessed conditions, details of which are included in the accompanying the Statutory Biodiversity Metric calculator and full condition assessments in Appendix B, and their biodiversity unit value. Detailed habitat descriptions per habitat type

are included following Table 1. Scientific names of species are given in Appendix C and as such are not included here in the main body of the report.

Table 1 Summary of the baseline area-based habitats within the site

UKHab habitat	Distinctiveness	Condition	Area (ha)	Strategic significance	Biodiversity units
Cereal crops	Low	N/A	16.79	Low	33.58
Modified grassland	Low	Poor	1.54	High	3.54
Bramble scrub	Medium	N/A	0.37	High	1.70
Mixed scrub	Medium	Moderate	0.15	High	1.38
		Poor	0.14		0.64
Other woodland; broadleaved	Medium	Moderate	9.77	High	89.88
Introduced shrub	Low	N/A	0.02	Low	0.04
Developed land; sealed surface	Very low	N/A	7.75	Low	0
		Total	36.53	**Total**	130.76

Other broadleaved woodland (w1g)

3.2.2. Other broadleaved woodland is abundant on site within the highway boundary. The woodland has been assessed as being in moderate condition. Species included field maple, sycamore, silver birch, dogwood, hazel, hawthorn, ash, pedunculate oak, elder, lime and holly. The cover of native tree and shrub species was high (>80% of the canopy and understorey, where present) and the number of native tree species in all but one parcel (W7, see Plate 5) was ≥5. Tree mortality across all parcels was <10%. All but two parcels had two storeys (W7 and W3 had one storey). No veteran trees were present and deadwood was present in less than 25% of the woodland, with the exception of W5 in which deadwood was present in 50% of the parcel.

3.2.3. Other broadleaved woodland present on site outside the highway boundary includes a small linear section of the other broadleaved woodland within the Coombe Pool Site SSSI. The woodland in this area is split into two areas of differing condition (W12 and W13).

3.2.4. Canopy and shrub species within W12 include >80% deciduous species including field maple, ash, sycamore, elder, horse chestnut, holly and rhododendron. Scot's pine is present on top of the embankment closer to the A46. Ground flora is very sparse and includes common nettle, bramble and ivy. Bluebells are also present

in the ground flora. The species is considered to be the native bluebell due to the drooping nature of the flowers. Bluebells are an ancient woodland indicator species, however due to a lack of other such indicator species the woodland is not considered ancient. The cover of native trees in the canopy and shrub layer exceeds 80% and there are considered to be three age classes and two storeys within the woodland. The common nettle in the field layer is considered to evidence extensive nutrient enrichment within the woodland. Deadwood was present in 50% of the woodland and veteran trees were recorded. Regeneration was recorded in the woodland with seedlings, saplings and trees 4-7cm diameter at breast height recorded.

Plate 5: Coombe Pool SSSI other broadleaved woodland W12 within the site baseline

3.2.5. Species within W13 include pedunculate oak, London plane, elder, hazel, ash, sycamore and rhododendron. Species within the sparse field layer is limited to common nettle and ivy. The woodland differs from W12 in that the woodland is considered to have three storeys including a shrub layer, deadwood as only present in >25% of the woodland, evidence of nutrient enrichment was absent, veteran trees were occasional and there was no evidence of woodland regeneration.

Plate 6: Coombe Pool SSSI other broadleaved woodland W13 within the site baseline

3.2.6. The woodland within the SSSI has been identified on MAGIC mapping (Defra, 2023) priority habitat inventory. However, it is considered that the species composition of the woodlands, including both the canopy storeys and the field layers, do not match those of the priority habitat woodland classifications, including the lowland mixed deciduous woodland priority habitat. As such these woodlands have been classified as other broadleaved woodland.

Modified grassland

3.2.7. Modified grasslands across the site include a pasture field grazed by cattle, mown highway verges and grassland verges of arable land. The grasslands are dominated by grasses and species include Yorkshire fog, perennial rye-grass, false oat grass and cock's-foot. Forbs present include, but are not limited to, white clover, ribwort plantain, dandelion and creeping buttercup.

3.2.8. All modified grassland parcels are assessed as being in poor condition, as they fail the non-negotiable criteria for achieving good or moderate condition of having 6-8 species per m2. The grassland all contains less than 20% cover of scrub and bracken, has less than 5% cover of bare ground and contains no invasive non-native species. All grassland parcels have less than 5% cover of physical damage, excluding G14 and G15 due to damage from machinery use from management activities. The sward height is generally varied except for G7, G13 and G14.

Mixed scrub

3.2.9. Mixed scrub is present in three parcels within the highway boundary on site. Dogwood and blackthorn are constant across the habitats and other species present include hawthorn, wild cherry, ash and hazel.

3.2.10. The majority of the mixed scrub on site has been assessed as being in poor condition, with one parcel (S8) in moderate condition. There are no invasive non-native species present in any of the scrub habitats or any clearings, glades or rides. Scrub habitats S9 and S11 consist predominantly of young shrubs and lack older individuals.

Bramble scrub

3.2.11. Bramble scrub is present in four parcels within the highway boundary on site. This habitat is typically dense bramble, however parcel S10 has some sheltered edges within the scrub. The condition of this habitat has not been assessed as it is pre-set at poor condition.

Urban – developed land; sealed surface

3.2.12. This habitat is assigned to all hard standing areas including the current A46 and B4082 carriageways and an area of the Hungerley Hall Farm farmyard. This very low distinctiveness habitat has no condition assessment within the Metric.

Cereal crops

3.2.13. Arable fields dominate the non-highway boundary areas of the site to the north of the existing A46 junction. The habitat is automatically assigned a 'N/A' condition assessment within the Metric as a low distinctiveness habitat.

3.3. Linear hedgerow baseline habitats

3.3.1. Table 2 summarises the baseline linear hedgerow habitats present on site, by habitat type and condition. For full condition assessments of each parcel see Appendix B. Detailed habitat descriptions per hedgerow type are included following Table 2. Scientific names of species are given in Appendix C and as such are not included here in the main body of the report.

Table 2 Summary of the baseline linear hedgerow habitats on site

Habitat ID*	UKHab habitat	Distinctiveness	Condition	Length (km)	Strategic significance	Biodiversity units
H1	Hedgerow (h2a)	Low	Good	0.02	High	0.14
H2	Hedgerow (h2a)	Low	Good	0.46	High	3.17
H3	Hedgerow (h2a) with trees	Medium	Moderate	0.03	High	0.28
H4	Hedgerow (h2a)	Low	Good	0.3	High	2.07
H5	Hedgerow (h2a)	Low	Moderate	0.002	High	0.01
H6	Hedgerow (h2a)	Low	Good	0.28	High	1.93

Habitat ID*	UKHab habitat	Distinctiveness	Condition	Length (km)	Strategic significance	Biodiversity units
H8	Hedgerow (h2a)	Low	Moderate	0.83	High	3.82
H10	Hedgerow (h2a) – associated with bank or ditch	Medium	Moderate	0.07	High	0.64
H11	Hedgerow (h2a) with trees – associated with bank or ditch	High	Good	0.19	High	3.93
H12	Hedgerow (h2a)	Low	Good	0.46	High	3.17
H13	Hedgerow (h2a)	Low	Moderate	0.62	High	2.85
H14	Hedgerow (h2a) – associated with bank or ditch	Medium	Good	0.13	High	1.79
H15	Hedgerow (h2a)	Low	Moderate	1.01	High	4.65
H16	Hedgerow (h2a)	Low	Good	0.003	High	0.02
H19	Hedgerow (h2a)	Low	Moderate	0.01	High	0.05
H20	Hedgerow (h2a)	Medium	Good	0.006	High	0.04
H22	Hedgerow (h2a) with trees	Medium	Good	0.004	High	0.06

*individual area ID's for habitat parcels are largely in numerical order. Some unique reference numbers are absent; however this is not due to omission of data but changes in the Order Limits during Stage 3.

Native hedgerow

3.3.2. Thirteen native hedgerows are present on site within the largely arable landscape to the north of the existing junction. The hedgerows are all species-poor (<5 native species per 30m) and are largely hawthorn hedgerows. The hedgerows are all managed and subject to some degree of pruning, however the height and width of hedgerows is generally maintained at a minimum 1.5m.

3.3.3. Strips of undisturbed perennial vegetation a minimum of 1m wide are present adjacent to some hedgerows however not all. Hedgerows are intact with no gaps. No invasive non-native species were recorded within the hedgerows. The hedgerows are all assessed as being in either moderate or good condition.

Plate 7: An example of a native hedgerow on site (H8)

Native hedgerow with trees

3.3.4. A species-poor native hedgerow with trees (H3) is present along a section of the driveway to Hungerley Hall Farm off the B4082. Species include hawthorn, blackthorn, elder and field maple. The hedgerow lacks an adjacent strip of undisturbed perennial vegetation as it is alongside the sealed surface driveway to the farm with heavily grazed cattle grassland adjacent to the west. The height and width of the canopy is a minimum 1.5m and there are no gaps or invasive non-native species within the hedgerow.

3.3.5. Trees species include pedunculate oak with a young and a mature tree present. The trees are in a good condition with no signs of damage.

Native hedgerow with trees - associated with a bank or ditch

3.3.6. One native hedgerow with trees -associated with a ditch is located within the arable land to the west of the existing carriageway. The ditch is considered to be dry for most of the year (i.e. does not hold water for more than four months of the year) and as such is classified as a feature associated with the hedgerow as opposed to a ditch within the watercourse module of the Metric. The ditch is largely overgrown with vegetation.

3.3.7. The hedgerow itself is similar in character to the other native hedgerows on site described above. In addition to hawthorn other species within the hedgerow include blackthorn and elder. The hedgerow is in good condition with a minimum height and width of 1.5m with a fairly continuous canopy with few gaps.

3.3.8. Seven individual trees and two groups of trees are present within the hedgerow and species include pedunculate oak, ash, field maple and holly with the most common tree species being ash. Tree ages range from young through to mature. The trees are in good condition with no evidence of damage.

Native hedgerow - associated with a bank or ditch

3.3.9. One species-poor hedgerow - associated with a ditch (H10) is located within the arable land to the east of the existing A46. Species include hawthorn, blackthorn, elder and dog-rose. The hedgerow is in moderate condition with a minimum height of 1.5m, no gaps and an undisturbed strip of perennial vegetation adjacent to it. However, the width of the hedgerow is generally <1.5m.

3.4. Linear watercourse baseline habitats

River type desk study results

3.4.1. There are three river reaches identified within the study area. These are defined by two large culverts which are present within the Order Limits (the A46 culvert approximately 80m in length and the B4082 culvert approximately 21m in length) and the upstream and downstream confluence. These features would be considered to significantly alter the flow and sediment movements, therefore multiple river type surveys have been undertaken. The results of these are detailed within Table 3.

Table 3 River type desk study results for the identified reaches within the study area

Reach	Reach river length (km)	River Type	Description	Applicable sections of brook and subreach references
Smite Brook A46 East Upstream: SP 38450 79231 Downstream: SP 38420 79229 *Between a pool upstream and the A46 culvert downstream.*	0.032	K	Unconfined, silt/clay, strait-sinuous	The 15m section east of the A46 culvert (subreach A)
Smite Brook A46 to B4082 Upstream: SP 38340 79209 Downstream: SP 38031 79388 *Between the A46 culvert upstream and the B4082 culvert downstream.*	0.43	K	Unconfined, silt/clay, strait-sinuous	The 18m section west of the A46 culvert (subreach A) The 21m section south of the B4082 outside but adjacent to the Order Limits, the 19m section adjacent to the south of the B4082 culvert within the Order Limits (subreach B)
Smite Brook B4082 to the River Sowe Upstream: SP 38027 79406 Downstream: SP 37991 79476 *Between the B4082 culvert upstream and the River Sowe*	0.08	K	Unconfined, silt/clay, straight-sinuous	The 23m section north of the B4082 culvert (subreach A)

Reach	Reach river length (km)	River Type	Description	Applicable sections of brook and subreach references
confluence downstream.				

MoRPh survey results

3.4.2. The condition of the brook within the four subreaches ranged from poor to moderate. Table 4 below details the results of the RCA. Appendix D includes photographs from the MoRPh survey and Appendix E includes detailed results for each index of each subreach. Descriptions of the subreaches are given below.

Table 4 River condition score for each subreach

Reach	Subreach	Condition
Smite Brook A46 East	A	Moderate
Smite Brook A46 to B4082	A	Moderate
	B	Fairly poor (over deep)
Smite Brook B4082 to the River Sowe	A	Poor (over deep)

Linear watercourse baseline units

3.4.3. Table 5 below details the biodiversity linear watercourse baseline, considering watercourse condition as assessed within the RCA, and watercourse and riparian encroachment in accordance with the latest version of Defra's Statutory Biodiversity Metric User Guide (Defra, 2024). The linear watercourse baseline equals 0.71 units from culverts and 'other rivers and streams' (Smite Brook).

Table 5 Biodiversity linear watercourse baseline

Reach	Subreach	Length (km)	Distinctiveness	Condition	Watercourse encroachment	Riparian encroachment	Units
Smite Brook A46 East	A	0.015	High	Moderate	Major	No encroachment/no encroachment	0.09
Smite Brook A46 to B4082	A	0.018	High	Moderate	Minor	Major/no encroachment	0.15
	B	0.04	High	Fairly poor	Minor	Major/major	0.22
Smite Brook B4082 to the River	A	0.023	High	Poor	Minor	No encroachment/no encroachment	0.11

Reach	Subreach	Length (km)	Distinctiveness	Condition	Watercourse encroachment	Riparian encroachment	Units
Sowe							
A46 culvert	N/A	0.081	Low	Poor	N/A	N/A	0.11
B4082 culvert	N/A	0.02	Low	Poor	N/A	N/A	0.03
					Total	0.71 units	

Smite Brook A46 east, subreach A

3.4.4. Smite Brook to the east of the A46 culvert was assessed as being in moderate condition. Linear watercourse BNG units for the 15m scoped in section equal 0.09. Watercourse encroachment was assessed as major due to the presence of the culvert abutments and a reinforced brick/laid stone (cemented) wall extensive on the right bank face. No encroachment is present within the riparian zone which consists of semi-natural deciduous woodland.

3.4.5. Positive MoRPh indicators scoring highly (three or four out of four) contributing to the moderate score include the extent of marginal aquatic vegetation extent (generally ≥5% of the margin, however extensive in areas, and consisting of emergent reeds and linear leaved species), bank face natural profile extent (considered extensive covering ≥33% of the bank face) and bank face bare sediment extent.

3.4.6. Negative MoRPh indicators scoring a high negative (-3 of -4 of between 0 and -4) and limiting the condition of the subreach include the extent of the bank face reinforcement (extensive on the right bank) and the severity of the reinforcement material (brick/laid stone (cemented)) and channel bed siltation.

Smite Brook A46 to B4082, Subreach A

3.4.7. Subreach A, to the west of the A46 culvert, was assessed as being in moderate condition. Linear watercourse BNG units for the 18m scoped in section equal 0.15. Watercourse encroachment was assessed as minor due to the presence of the culvert abutments. No riparian encroachment is present on the left bank which is semi-natural woodland habitat. Riparian encroachment on the right bank is assessed as major due to the extensive president of permanently vegetated agriculture, including within 0m of the bank top.

3.4.8. Positive MoRPh indicators scoring highly (three or four out of four) include the extent of channel margin aquatic vegetation (emergent reeds/linear leaved species) extensive on the right bank and present on the left bank.

3.4.9. Negative MoRPh indicators scoring a high negative (-3 of -4 of between 0 and -4) and limiting the condition of the subreach include bank face non-native invasive species cover due to the present of Himalayan balsam (Impatiens glandulifera) seedlings and channel bed siltation.

Smite Brook A46 to B4082, Subreach B

3.4.10. Subreach B to the south of the B4082 culvert was assessed as being in fairly poor condition. Linear watercourse BNG units for the 40m scoped in section equal 0.22. The subreach was categorised as being in moderate condition within Cartographer, however as the river shape was 2.32 it is considered likely that this section of the brook is over deep as it falls at the lower end of the identified shape band ≥2 to <4 at which the majority of channels have been found to be over deep. As such, the final condition score was reduced from moderate to fairly poor.

3.4.11. Watercourse encroachment was assessed as minor due to the presence of the B4082 culvert abutments on both banks and reinforced banks on the left bank. Riparian encroachment was assessed as major on the left bank due to the extensive presence of recreational, managed grassland within the riparian zone. Right bank riparian zone encroachment has also been classified as major due to the presence of a heavily poached section of riverbank where cattle from the adjacent field are allowed to approach the waters' edge.

3.4.12. Positive MoRPh indicators scoring highly (three or four out of four) include the extent of the bank face natural profile, the richness of the bank face natural profile, the extent of bank face bare sediment and channel bed material richness (including gravel/pebble, silt and a continuous silt layer).

3.4.13. Negative MoRPh indicators scoring a high negative (-3 of -4 of between 0 and -4) and limiting the condition of the subreach include bank face reinforcement extent (due to culvert abutments and brick/laid (cemented) reinforcement at the downstream end), channel bed siltation and the severity of channel bed artificial features (due to the presence of large trash).

Smite Brook B4082 to the River Sowe, Subreach A

3.4.14. Subreach A of the Smite Brook B4082 to the River Sowe reach has been assessed as being in poor condition. Linear watercourse BNG units for the 23m scoped in section equal 0.11. The subreach was categorised as being in fairly poor condition, however as the river shape was 2.0 this section of the brook has been considered likely over deep and the condition reduced to poor.

3.4.15. Watercourse encroachment was assessed as minor in consideration of the presence of the culvert abutments and assumed presence of reinforcement beyond this, as was recorded for the section of watercourse to the south of the B4082 culvert (Smite Brook A46 to B4082, Subreach B). No riparian

encroachment is considered present as the riparian zone comprises semi-natural deciduous woodland.

3.4.16. Note, consideration should be given to the survey limitations and assumptions in relation to this description. No positive MoRPh indicators scored highly (three or four out of four). Positive indicators for which there was a moderate score of two include bank top tree feature richness (including saplings/trees, trees/shrubs trailing branches into the channel, and assumed to include fallen trees and leaning trees), bank face natural bank profile richness, extent of bank face bare sediment, channel margin physical feature extents (including an extensive earth vegetated side bar on the right bank), channel bed tree feature richness and channel bed material richness (silt and organic material).

3.4.17. Negative MoRPh indicators scoring a high negative (-3 of -4 of between 0 and -4) and limiting the condition of the subreach include bank face non-native invasive species (assumed presence of Himalayan balsam on the bank face as the species is present to the south of the culvert), channel bed siltation and the severity of channel bed artificial features (due to the presence of large trash).

3.5. On-site BNG baseline

3.5.1. Calculations to assess the baseline biodiversity were completed using the Statutory Biodiversity Metric, using the UKHab classifications as described above.

3.5.2. The on-site BNG baseline calculations show a pre-development biodiversity value of 130.77 with regards to area-based habitats composed of habitats including other broadleaved woodland, modified grassland, cereal crops, mixed scrub and bramble scrub, and 28.62 with regards to linear hedgerow habitats (hedgerow, hedgerow with trees, hedgerow – associated with a bank or ditch and hedgerow with trees – associated with a bank or ditch). The linear watercourse pre-development biodiversity value is 0.71 units from culverts and ‘other rivers and streams’.

4. On-site post-construction BNG

4.1. Habitat retention

4.1.1. Tables 6 and 7 below detail the retained areas and lengths of baseline habitats as outlined within the Environmental Masterplan for the DCO application.

Table 6 Summary of the baseline area-based habitats retained post-construction.

UKHab habitat	Distinctiveness	Condition	Arearetained	Strategic significance	Biodiversity units retained
Cereal crops	Low	N/A	0.09	Low	0.18
Modified grassland	Low	Poor	0.33	High	0.76
Bramble scrub	Medium	N/A	0.01	High	0.05
Mixed scrub	Medium	Moderate	0.14	High	1.29
Other broadleaved woodland	Medium	Moderate	3.83	High	35.24
Introduced scrub	Low	N/A	0.02	Low	0.04
Total baseline area-based units retained				37.55	

Table 7 Summary of the baseline linear hedgerow habitats retained post-construction.

Habitat ID*	UKHab habitat	Distinctiveness	Condition	Strategic significance	Retained	Units retained
H2	Hedgerow (h2a)	Low	Good	High	0.09	0.62
H3	Hedgerow (h2a) with trees	Medium	Moderate	High	0.03	0.28
H4	Hedgerow (h2a)	Low	Good	High	0.3	2.07
H5	Hedgerow (h2a)	Low	Moderate	High	0.002	0.01
H6	Hedgerow (h2a)	Low	Good	High	0.28	1.93
H8	Hedgerow (h2a)	Low	Moderate	High	0.41	1.89
H10	Hedgerow (h2a) – associated with bank or ditch	Medium	Moderate	High	0.02	0.18
H11	Hedgerow (h2a) with	High	Good	High	0.03	0.62

Habitat ID*	UKHab habitat	Distinctiveness	Condition	Strategic significance	Retained	Units retained
	trees – associated with bank or ditch					
H13	Hedgerow (h2a)	Low	Moderate	High	0.24	1.10
H14	Hedgerow (h2a) – associated with bank or ditch	Medium	Good	High	0.007	0.10
H15	Hedgerow (h2a)	Low	Moderate	High	0.53	2.44
H19	Hedgerow (h2a)	Low	Moderate	High	0.01	0.05
H20	Hedgerow (h2a)	Medium	Good	High	0.006	0.04
H22	Hedgerow (h2a) with trees	Medium	Good	High	0.004	0.06
Total retained linear hedgerow units						11.38

4.1.2. Smite Brook will not be directly impacted by the Scheme. No works are proposed within the riparian zone of the following three of the four scoped in brook subreaches:

- Smite Brook A46 to B4082 subreach A
- Smite Brook A46 to B4082 subreach B
- Smite Brook B4082 to the River Sowe subreach A

4.1.3. Therefore, the baseline linear watercourse units for these three subreaches (0.11, 0.22 and 0.11 units respectively) would be retained within the post-construction calculations.

4.2. Habitat creation – area-based habitats

4.2.1. Table 8 summarises the proposed area-based habitats within the Environmental Masterplan for the DCO application. Condition assessments are provided in Appendix B to indicate targeted condition criteria considered achievable.

Table 8 Summary of the post-construction area-based habitats created on site

UKHab habitat	Distinctiveness	Target condition	Area (ha)	Strategic significance	Biodiversity units (+1yr delay)
Other woodland; broadleaved	Medium	Moderate	6.41	High	33.35
Mixed scrub	Medium	Poor	1.5	High	6.43
Mixed scrub	Medium	Moderate	0.68	High	5.05
Vegetated garden	Low	N/A	0.33	Low	0.61
SuDS	Low	Moderate	0.69	High	1.84
		Moderate	0.75	High	2.0
Modified grassland	Low	Moderate	2.76	High	10.62
Other neutral grassland	Medium	Good	4.33	High	40.38
Rural tree	Medium	Moderate	2.49	High	8.45
Developed land sealed surface	Very low	N/A	14.66	Low	0
Total area-based units created on site				108.73	

Modified grassland (species-rich grassland (verge))

4.2.2. Grasslands proposed on the road verges have been classified as modified grassland targeting a moderate condition. This classification as modified grassland as opposed to the higher distinctiveness other neutral grassland is partially on a precautionary basis and to acknowledge the likely lower achievable condition of grassland on a highway verge. However, it is also assumed these grasslands will not meet the species-richness requirements to classify as other neutral grassland due to either a frequent mowing regime to maintain a low sward height and sight lines or lack of a mowing regime due to the location on verges. These situations would result in a loss of any species-richness originally sown, due to either a lack of seed bank or nutrient enrichment respectively.

4.2.3. Moderate condition is considered achievable. To achieve this the grassland will need to have a high (for modified grassland) species-richness with 6-8 species per m². To assist in achieving this condition the grassland should be originally sown with a species-rich mixture.

Other neutral grassland (species-rich grassland)

4.2.4. Other neutral grasslands are situated adjacent to proposed modified grasslands further back from the roadside. These are classified in the Environmental Masterplan as species-rich and are more likely to be subject to a traditional meadow management mowing regime (as detailed within the Major Project Instructions Document: Low Nutrient Grasslands (MP Delivery Services, 2020)), as they are not on the immediate verge and as such are not anticipated to impact sight lines. Given this, they have been classified as the medium distinctiveness habitat other neutral grassland targeting a good condition.

Other broadleaved woodland (woodland)

4.2.5. The woodland proposed within the Environmental Masterplan has been classified as the medium distinctiveness habitat other broadleaved woodland following review of the schedule of planting mixes. Creation of a high distinctiveness priority woodland would require specific species compositions in the canopy/ies and field layers and as such in the lack of species lists for the field layer this medium distinctiveness habitat has been considered most likely and achievable.

Mixed scrub (scrub and shrubs)

4.2.6. Scrub and shrubs are proposed within the Environmental Masterplan. These habitats will consist of at least three native woody species (with no single species comprising more than 75% cover) and as such have been classified as mixed scrub.

4.2.7. Scrub within the Environmental Masterplan is largely proposed as linear strips along road verges and surrounding woodland habitats. As such it is not considered feasible to manage these areas to clearings, glades and/or rides, or to achieve a well-developed edge. Additionally, and due to these limitations, it is also considered that the areas would likely not achieve regeneration and an age range and therefore the majority of the scrub within the Environmental Masterplan has been input within the calculations as achieving poor condition.

4.2.8. The exceptions to this are slightly larger areas of scrub where it would be considered feasible to manage to introduce and maintain clearings, glades and/or rides. These areas will target moderate condition and are namely areas surrounding the southernmost drainage basin, the areas to the south and north of the central drainage basin, scrub proposed around the northern drainage basin and scrub proposed within the dumbbell junction atriums.

Individual trees – rural

4.2.9. Individual trees in the Environmental Masterplan are assigned in the Metric as ‘individual trees – rural’. There are 612 trees proposed. The trees will be planted

at 12cm – 14cm girth and have therefore been input as 'small' trees in accordance with the Statutory Biodiversity Metric.

4.2.10. Individual trees will target moderate condition.

SuDS

4.2.11. The SuDS will be created with species suited to the anticipated environmental conditions. Habitats proposed include marginal planting, banks and ditches seeded with Emorsgate EP1 pond edge mixture and marsh and wet grassland.

4.2.12. SuDS will target moderate condition.

Developed land; sealed surface

4.2.13. This habitat is assigned to all hardstanding areas including the proposed road layout and other proposed hard standing areas. This habitat is automatically assigned a 'N/A – other' condition within the Metric.

4.3. Habitat creation – linear hedgerow habitats

4.3.1. Table 9 summarises the proposed linear hedgerow habitats within the Environmental Masterplan.

Table 9 Summary of the post-construction linear hedgerow habitats created on site

UKHab habitat	Distinctiveness	Condition	Length (km)	Strategic significance	Biodiversity units (+1yr delay)
Species rich native hedgerow	Medium	Moderate	0.29	High	2.15
Species rich native hedgerow with trees	High	Moderate	2.09	High	19.49
Total linear foliage habitat units created				**21.64**	

4.3.2. All hedgerows created will contain five or more native woody species per 30m length to achieve a species-rich native hedgerow.

4.3.3. The native species-rich hedgerows with trees will include trees <20m along its entire length to classify as hedgerows with trees.

4.3.4. All created hedgerows will target moderate condition.

4.4. Post-construction - linear watercourse habitats

4.4.1. The Scheme includes works within the riparian zone of Smite Brook A46 East Subreach A. The A46 mainline realignment would result in some embankment works and subsequent landscaping within the riparian zone. Proposed landscaping includes creation of species-rich grassland within the riparian zone, which within the baseline is semi-natural deciduous woodland. Works within the riparian zone also include fencing repair and replacement works which would include some removal/pruning of understorey shrubs to facilitate access.

4.4.2. As the scrub/shrubs were recorded on the bank top within the riparian zone proposed fencing replacement works are not anticipated to impact the condition of the watercourse from the baseline condition.

4.4.3. The proposed species-rich grassland would be subject to management similar to traditional meadow management (limited and timed mowing and removal of arisings) to promote and maintain species richness and ecological value. As such this post-construction change to the riparian zone from the baseline semi-natural deciduous woodland is not considered to be encroachment. In a post-construction scenario modelling exercise undertaken on Cartographer the following MoRPh indices were considered to register this post-construction change:

- The presence and extent of short-creeping herbs and grasses on the bank top – this index was changed from present on both banks in the baseline scenario to extensive in the post-construction scenario on both banks.
- The presence and extent of trees on the bank top – this index was retained as extensive cover on both banks within the post-construction scenario.
- Vegetation shading the channel – this index has been retained as present in the post-construction scenario.
- Aquatic and marginal vegetation presence and extent indices – given the subreach within the baseline has extensive cover of well-developed marginal vegetation, suggesting enough openness for herbaceous species to develop, these indices have not been changed from the baseline scores.

4.4.4. The post-construction modelling has identified no change to the condition of the subreach between the baseline and post-construction scenario. Whilst there will be temporary impacts to the riparian zone within the construction phase, as the construction phase (inclusive of landscaping) is programmed to be complete in 22 months and there would be no change in the condition of the subreach on completion of construction, this temporary loss has not been registered in the Metric in accordance with Defra's latest version of the Statutory Biodiversity Metric User Guide.

4.5. On-site post-construction BNG

4.5.1. In total, the post development on-site biodiversity value is predicted to be 146.29 area-based habitat units and 33.03 linear-hedgerow habitat units with a +11.87% and +15.38% net gain respectively. Post-construction linear watercourse units equal 0.71 units with no change from the baseline units.

4.5.2. However, the in-built Metric trading standards with regards to the medium distinctiveness habitat other broadleaved woodland have not been met as under the Environmental Masterplan DCO application there is a loss of -21.30 units from this habitat which has not been offset appropriately under the trading standards.

4.5.3. The trading standards have also not been met for the following linear hedgerow habitat: native hedgerow with trees – associated with bank or ditch (high distinctiveness) for which there is has been a loss of -3.31 units which have not been appropriately offset within the trading standards.

5. Conclusion

5.1.1. The results of the UKHab survey concluded the area-based habitats recorded within the site include modified grassland, other broadleaved woodland, bramble scrub, mixed scrub, cereal crops and linear foliage habitats include native hedgerows, native hedgerows with trees, native hedgerows – associated with a bank or ditch and native hedgerows with trees – associated with a bank or ditch. The area-based habitat baseline has been calculated as 130.77 units, and the linear-foliage baseline as 28.62 units, in accordance with the Statutory Biodiversity Metric. The results of the RCA survey have identified 0.71 linear watercourse units within the baseline from culverts and 'other rivers and streams'.

5.1.2. Post-construction BNG calculations based on the Environmental Masterplan DCO submission have identified a +11.87% and +15.38% net gain for area-based and linear hedgerow habitats respectively. The in-built Metric trading standards with regards to the medium distinctiveness area-based habitat other broadleaved woodland and the high distinctiveness linear hedgerow habitat native hedgerow - with trees – associated with bank or ditch have not been met as under the Environmental Masterplan DCO submission plans there is a loss of -21.30 and -3.31 units from these habitats respectively which have not been appropriately offset within the trading standards. As the Scheme as a Nationally Significant Infrastructure Project (NSIP) submitting a DCO application in RIS2 it is not subject to mandatory BNG under the Environment Act 2021. As such there is no legal requirement for the trading standards in-built into the Statutory Biodiversity Metric to be met. Following liaison with the National Highways KPI team it has been confirmed that, providing the 10% net gain KPI for area-based and linear hedgerow habitats is being met, there is no requirement to meet the trading standards. The exception to this would be if the Environmental Statement for the Scheme was reported a significant effect on relevant habitats, which is not the case for this Scheme and these habitats (i.e. other broadleaved woodland and native hedgerows with tree s- associated with bank or ditch).

5.1.3. A schedule of planting mixes and an OLEMP have been produced within Appendix B.4 of the First Iteration EMP(**TR010066/APP/6.5**) to support the DCO application. The OLEMP will be updated at the Detailed Design Stage to include necessary management prescriptions and monitoring requirements to achieve and maintain the targeted conditions. The OLEMP will cover a minimum of 28 years post construction, as this is the longest time to target condition with the Statutory Biodiversity Metric calculations.

5.1.4. The calculations undertaken and detailed above for linear watercourse habitats conclude no loss of linear watercourse baseline units as a result of the Scheme. Linear watercourse units pre- and post-construction equal 0.71 units from culverts and 'other rivers and streams'.

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Appendix A. Figure 1 - UKHAB map

Legend

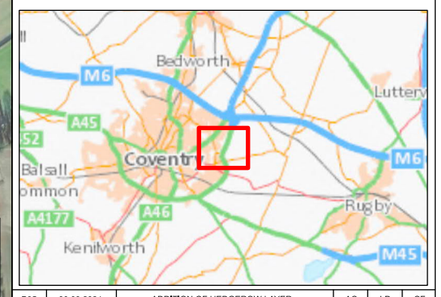
- Order limits
- Inaccessible area

UKHAB Code Linear

- Hedgerow (priority habitat) (h2a)

UKHAB Code Area

- Cereal crops (c1c)
- Modified grassland (g4)
- Bramble scrub (h3d)
- Mixed scrub (h3h)
- Developed land, sealed surface (u1b)
- Rivers and lakes (r)
- Other woodland-broadleaved (w1g7)



REV	DATE	REVISION NOTE	ORG	CHK'D	APP
P05	30.09.2024	ADDITION OF HEDGEROW LAYER	AC	LP	CF

Designer

Contractor

Client

national highways

Project Title

A46 COVENTRY JUNCTIONS (WALSGRAVE)

Project Stage

DCO APPLICATION

Drawing Title

FIGURE 1 – UK HABITAT CLASSIFICATIONS SURVEY RESULTS

Suitability

FOR INFORMATION

Sheet Size	Scale	Status	Revision
A3	1:12,000	S3	P05

Drawing Number

HE604820-OIL-EBD-00-DR-LB-30013

Appendix B. Full condition assessments

Baseline habitats

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UKHab Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
See UKHab					
Individual Parcel Reference Numbers (G-)			1	2	4
Condition Assessment Criteria					
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		0	0	0
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		1	1	1
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1	1	1
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		1	1	1
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1	1	1
6	Cover of bracken less than 20%.		1	1	1
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1	1	1
		Total Assessment score:	6	6	6
		Condition Assessment:	**P**	**P**	**P**

Condition Assessment Result	Condition Assessment Score			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7	Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7	Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria	Poor (1)			

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UKHab Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
See UKHab					
Individual Parcel Reference Numbers (G-)			5	6	7
Condition Assessment Criteria					
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		0	0	0
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		1	1	0
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1	1	1
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		1	1	1
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1	1	1
6	Cover of bracken less than 20%.		1	1	1
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1	1	1
		Total Assessment score:	6	6	5
		Condition Assessment:	**P**	**P**	**P**
Condition Assessment Result		**Condition Assessment Score**			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)			

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UKHab Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
See UKHab					
Individual Parcel Reference Numbers (G-)			8	9	10
Condition Assessment Criteria					
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		0	0	0
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		1	1	1
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1	1	1
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		1	1	1
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1	1	1
6	Cover of bracken less than 20%.		1	1	1
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1	1	1
		Total Assessment score:	6	6	6
		Condition Assessment:	**P**	**P**	**P**
Condition Assessment Result		**Condition Assessment Score**			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)			

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UKHab Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
See UKHab					
Individual Parcel Reference Numbers (G-)			11	12	13
Condition Assessment Criteria					
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		0	0	0
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		1	1	0
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1	1	1
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		1	1	1
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1	1	1
6	Cover of bracken less than 20%.		1	1	1
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1	1	1
		Total Assessment score:	6	6	5
		Condition Assessment:	**P**	**P**	**P**
Condition Assessment Result		**Condition Assessment Score**			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)			

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UKHab Habitat Type(s)			
Grassland - Modified grassland			
Habitat Description			
See UKHab			
Individual Parcel Reference Numbers (G-)			14
Condition Assessment Criteria			
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		0
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		0
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		0
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1
6	Cover of bracken less than 20%.		1
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1
		Total Assessment score:	4
		Condition Assessment:	**P**
Condition Assessment Result		**Condition Assessment Score**	
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)	
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)	
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)	

Condition Sheet: SCRUB Habitat Type								
UKHab Habitat Type								
Heathland and shrub - Blackthorn scrub **Heathland and shrub - Bramble scrub** **Heathland and shrub - Gorse scrub** **Heathland and shrub - Hawthorn scrub** **Heathland and shrub - Hazel scrub** **Heathland and shrub - Mixed scrub** **Heathland and shrub - Sea buckthorn scrub (Annex 1)**								
Habitat Description								
See UKHab								
For sea buckthorn scrub use Habitats Directive Annex 1 definition								
Individual Parcel Reference Numbers (S-)			6	7	8	9	10	11
Condition Assessment Criteria								
1	Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).		0	0	1	1	0	0
2	There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.		1	1	1	0	0	0
3	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.		1	1	1	1	1	1
4	The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).		1	1	1	0	1	0
5	There are clearings, glades or rides present within the scrub, providing sheltered edges.		0	0	0	0	1	0
		Total Assessment score:	3	3	4	2	3	1
		Condition Assessment:	**M**	**M**	**M**	**P**	**M**	**P**

Condition Assessment Result	Condition Assessment Score
Passes 5 of 5 criteria	Good (3)
Passes 3 or 4 of 5 criteria	Moderate (2)
Passes 0, 1 or 2 of 5 criteria	Poor (1)

Notes

Footnote 1 - Species considered undesirable for this habitat type include: creeping thistle *Cirsium arvense*, common nettle *Urtica dioica*, cherry laurel *Prunus laurocerasus*, snowberry *Symphoricarpos* spp., buddleia *Buddleja* spp., cotoneaster *Cotoneaster* spp., Spanish bluebell *Hyacinthoides hispanica* (or hybrids).

Each attribute is assigned to one of five functional groups (A – E), as indicated in Table TS1-2 and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria according to the approach set out in Table TS1-3.

The hedgerow condition assessment generates a weighting (score) ranging from 1-3, which is used within the biodiversity metric 3.0. The scores for each are set out in tables TS1-3 and TS1-4 below.

TABLE TS1-3: Hedgerow condition assessment and weighting

Condition categories for hedgerows without trees		
Category	**Maximum number of attributes that can fail to meet 'favourable condition' criteria in Table TS1-2**	**Weighting (score)**
Good	No more than 2 failures in total; AND No more than 1 in any functional group.	3
Moderate	No more than 4 failures in total; AND <u>Does not fail both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; OR <u>Fails both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1
Condition categories for hedgerows with trees		
Category	**Maximum number of attributes that can fail to meet 'favourable condition' criteria in Table TS1-2**	**Weighting (score)**
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3

Moderate	No more than 5 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C2 & E1 = Moderate condition).	2
Poor	Fails a total of more than 5 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1

Hedgerow favourable condition attributes										
Attributes and functional groupings (A, B, C, D & E)		**Criteria (the minimum requirements for 'favourable condition'**	**Description**							
Individual Hedgerow Reference Numbers (H-)				1	2	3	4	5	6	8
Core groups - applicable to all hedgerow types										
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees.Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).	1	1	1	1	1	1	1
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[4]).	1	1	1	1	1	1	1
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	1	0	1	1	1	1	1

B2.	Gap - hedge canopy continuity	· Gaps make up <10% of total length and · No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	1	1	1	1	1	1	1	
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length:· measured from outer edge of hedgerow, and· is present on one side of the hedge (at least)	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small).Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	1	1	0	1	0	1	0	
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (Urtica spp.), cleavers (Galium aparine) and docks (Rumex spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	0	0	1	0	0	1	0	
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.	1	1	1	1	1	1	1	

D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g. excessive hedge cutting).	1	1	0	1	1	0	0	
Additional group - applicable to hedgerows with trees only											
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.			1					
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.			1					
			Total Assessment Score:	7	6	6	7	6	7	5	
			Condition Assessment:	**G**	**G**	**G**	**G**	**M**	**G**	**M**	

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition'	Description								
Individual Hedgerow Reference Numbers (H-)				11	12	13	14	15	16	19	20
Core groups - applicable to all hedgerow types											
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees.Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).	1	1	1	1	1	1	1	1
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[4]).	1	1	1	1	1	1	1	1
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	1	1	1	1	1	1	1	1

B2.	Gap - hedge canopy continuity	· Gaps make up <10% of total length and · No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	1	1	1	1	1	1	1	1
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length:· measured from outer edge of hedgerow, and· is present on one side of the hedge (at least)	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small).Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	1	0	0	1	0	1	0	1
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (Urtica spp.), cleavers (Galium aparine) and docks (Rumex spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	1	1	0	1	0	0	0	0
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.	1	1	1	1	1	1	1	1

D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g. excessive hedge cutting).	1	1		1	1	1	0	1
Additional group - applicable to hedgerows with trees only											
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.	1							
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	1							
			Total Assessment Score:	8	7	6	8	6	7	5	7
			Condition Assessment:	**G**	**G**	**M**	**G**	**M**	**G**	**M**	**M**

Condition Sheet: WOODLAND Habitat Type

UKHab Habitat Type(s)

Woodland and forest - Lowland beech and yew woodland
Woodland and forest - Lowland mixed deciduous woodland
Woodland and forest - Native pine woodlands
Woodland and forest - Other coniferous woodland
Woodland and forest - Other Scot's pine woodland
Woodland and forest - Other woodland; broadleaved
Woodland and forest - Other woodland; mixed
Woodland and forest - Upland birchwoods
Woodland and forest - Upland mixed ashwoods
Woodland and forest - Upland oakwood
Woodland and forest - Wet woodland

Habitat Description

See UKHab

This condition sheet is based on the England Woodland Biodiversity Group (EWBG) Woodland Condition Survey Method, available here: https://woodlandwildlifetoolkit.sylva.org.uk/assess

Condition Assessment Criteria														
				Individual Parcel Reference Numbers (W-)	1	2	3	4	5	6	7	8	9	10	11
Indicator		Good (3 points)	Moderate (2 points)	Poor (1 point)											
1	**Age distribution of trees**	Three age classes present	Two age classes present	One age class present	1	1	2	1	1	2	2	2	3	3	1
2	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	3	3	3	3	3	3	3	3	3	3	3
3	**Invasive plant species**	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	3	3	3	3	3	3	3	3	3	3	3
4	**Number of native tree species**	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	2	2	3	3	3	3	3	3	3	3	2
5	**Cover of native tree and shrub species**	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	3	3	3	3	3	3	3	3	3	3	3
6	**Open space within woodland**	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	3	3	3	3	3	3	3	3	3	3	3

7	**Woodland regeneration**	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	1	1	2	2	2	2	2	2	2	2	1
8	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high risk pest or disease present	3	3	3	3	3	3	3	3	3	3	3
9	**Vegetation and ground flora**	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	1	1	1	1	1	1	1	1	1	1	1
10	**Woodland vertical structure**	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	2	2	2	2	2	2	3	3	3	3	2
11	**Veteran trees**	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	1	1	1	1	1	1	1	1	1	1	1
12	**Amount of deadwood**	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	1	1	1	1	1	1	1	1	1	1	1
13	**Woodland disturbance**	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	2	3	3	3	3	2	3	3	3	3	3
				Total score (out of a possible 39)	**27**	**27**	**30**	**29**	**29**	**29**	**31**	**31**	**32**	**32**	**27**

Condition Assessment (P = poor, M = moderate and G = good)	M	M	M	M	M	M	M	M	M	M	M

Condition Assessment Result	Condition Assessment Score
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)

Post-construction habitats

The footnotes from the Statutory Biodiversity Metric condition assessments have been omitted from these tables for ease of viewing. See official Statutory Biodiversity Metric condition assessment sheets for the footnotes.

Modified grassland (amenity grass verge)

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UKHab Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
Condition Assessment Criteria					
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving moderate condition.**		1		
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		0		
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		1		
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.		0		
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		1		
6	Cover of bracken less than 20%.		1		
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).		1		
		Total Assessment score:	5		
		Condition Assessment:	**P**		
Condition Assessment Result		**Condition Assessment Score**			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)			

Other neutral grassland (species-rich grassland)

Condition Sheet: GRASSLAND Habitat Type (medium, high and very high distinctiveness)					
UKHab Habitat Type(s)					
Grassland – Lowland calcareous grassland **Grassland – Lowland dry acid grassland** **Grassland – Lowland meadows** **Grassland – Other lowland acid grassland** **Grassland – Other neutral grassland** **Grassland – Tall herb communities** **Grassland – Upland acid grassland** **Grassland – Upland acid grassland** **Grassland – Upland calcareous grassland** **Grassland – Upland hay meadows** **Sparsely vegetated land – Calaminarian grassland**					
Condition Assessment Criteria					
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description). **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**		1		
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		1		
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.		1		
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.		1		
E	Combined cover of species indicative of suboptimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of the total area. If any invasive non-native species (as listed on Schedule 9 of the WCA) are present, this criterion is automatically failed.		1		
		Total Assessment score:	5		
		Condition Assessment:	**G**		
Condition Assessment Result		**Condition Assessment Score**			
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7		Good (3)			
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7		Moderate (2)			
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)			

Mixed scrub (scrub and shrubs)

Condition Sheet: SCRUB Habitat Type
UKHab Habitat Type
Heathland and shrub - Blackthorn scrub **Heathland and shrub - Bramble scrub** **Heathland and shrub - Gorse scrub** **Heathland and shrub - Hawthorn scrub** **Heathland and shrub - Hazel scrub** **Heathland and shrub - Mixed scrub** **Heathland and shrub - Sea buckthorn scrub (Annex 1)**
Habitat Description

	Condition Assessment Criteria								
A	The parcel represents a good example of its habitat type – the appearance and composition of the vegetation closely matches its UKHab description (when in its natural range). -At least 80% of scrub is native -There are at least three native woody species -No single species comprises more than 75% of the cover (except hazel *Corylus avellana,* common juniper *Juniperus communis,* sea buckthorn *Hippohae rhamnoides,* (only in its restricted native range), or box *Buxus sempervirens,* which can be up to 100% cover).		1	1					
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran) shrubs are all present.		0	0					
C	There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA) and species indicative of suboptimal condition make up less than 5% of ground cover.		1	1					
D	The scrub has a well-developed edge with scattered scrub and tall grassland and/or forbs present between the scrub and adjacent habitat(s).		0	0					
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.		1	0					
		Total Assessment score:	3	2					
		Condition Assessment:	**M**	**P**					

Condition Assessment Result	Condition Assessment Score
Passes 5 of 5 criteria	Good (3)
Passes 3 or 4 of 5 criteria	Moderate (2)
Passes 0, 1 or 2 of 5 criteria	Poor (1)

Rural trees

Condition Sheet: INDIVIDUAL TREES Habitat Type					
UKHab Habitat Type(s)					
Individual trees – Urban trees **Individual trees – Rural trees**					
Condition Assessment Criteria					
A	The tree is a native species (or at least 70% within the block are native species)		1		
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5m wide (individual trees automatically pass this criterion).		0		
C	The tree is mature (or more than 50% within the block are mature).		0		
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.		1		
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.		0		
F	More than 30% of the tree canopy area is oversailing vegetation beneath.		1		
		Total Assessment score:	3		
		Condition Assessment:	**M**		
Condition Assessment Result		**Condition Assessment Score**			
Passes 5 or 6 criteria		Good (3)			
Passes 3 or 4 criteria		Moderate (2)			
Passes 2 or fewer criteria		Poor (1)			

SuDS

Condition Sheet: URBAN Habitat Type					
UKHab Habitat Type(s)					
Sparsely vegetated land – Ruderal/Ephemeral **Sparsely vegetated land – Tall forbs** **Urban – Allotments** **Urban – Biodiverse green roof** **Urban – Bioswale** **Urban – Cemeteries and churchyards** **Urban – Façade-bound green wall** **Urban – Ground based green wall** **Urban – Intensive green roof** **Urban – Open mosaic habitat on previously developed land** **Urban – Rain garden** **Urban – Sustainable drainage system (SuDS)** **Urban – Vacant or derelict land** **Urban – bare ground**					
Condition Assessment Criteria					
A	Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation types does not account for more than 80% of the total habitat area.		1		
B	The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.		0		
C	Invasive non-native plant species (listed on Schedule 9 of WCA) and others which are to the detriment of native wildlife (using professional judgement) cover less than 5% of the total vegetated area. **Note – to achieve Good condition, this criterion must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).**		1		
Additional criteria - must be assessed for bioswale and SuDS habitat types only:					
E1	Plant species are mostly native. If non-native species are present, they should not be detrimental to the habitat or native wildlife.		0		
E2	The vegetation is comprised of plant species suited to wetland or riparian situations.		1		
		Total Assessment score:	3		
		Condition Assessment:	**M**		
Condition Assessment Result		**Condition Assessment Score**			
Passes all 3 core criteria AND Meets the requirements for good condition within criterion C AND Passes all additional criteria relevant to specific habitat type (Group E)		Good (3)			

Passes 3 or 4 of 5 criteria OR Passes 5 of 5 criteria but does not meet the requirements for good condition within criterion C	Moderate (2)			
Passes 2 or fewer of 5 criteria	Poor (1)			

Hedgerow

Each attribute is assigned to one of five functional groups (A – E), as indicated in Table TS1-2 and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria according to the approach set out in Table TS1-3.
The hedgerow condition assessment generates a weighting (score) ranging from 1-3, which is used within the biodiversity metric 4.0 with a description of the condition results detailed below.

Hedgerow

Good

- No more than 2 failures in total AND no more than 1 in any functional group. Weighting score 3.

Moderate

- No more than 4 failures in total AND does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & C2 = moderate condition). Weighting score 2.

Poor

- Fails a total of more than 4 attributes OR fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = poor condition). Weighting score 1.

Hedgerow with trees

Good

- No more than 2 failures in total AND no more than 1 failure in any functional group. Weighting score 3.

Moderate

- No more than 5 failures in total AND does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, C2 & E1 = moderate condition). Weighting score 2.

Poor

- Fails a total of more than 5 attributes OR fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = poor condition). Weighting score 1.

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition'	Description								
Individual Hedgerow Reference Numbers (H-)				Hedgerow	Hedgerow with trees						
Core groups - applicable to all hedgerow types											
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).	0	0						
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[4]).	1	1						
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	0	0						

B2.	Gap - hedge canopy continuity	· Gaps make up <10% of total length and · No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	1	1						
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length:· measured from outer edge of hedgerow, and· is present on one side of the hedge (at least)	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1m in width and must be present along at least one side of the hedgerow. This criterion recognised the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc can limit available habitat niches.	0	0						
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (Urtica spp.), cleavers (Galium aparine) and docks (Rumex spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	0	0						
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of the WCA)	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on the archaeophytes and neophytes see the JNCC website, as well as the BSBI website where the 'Online Atlas of	1	1						

		and recently introduced species.	the British and Irish Flora' contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website.								
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g. excessive hedge cutting).	1	1						
Additional group - applicable to hedgerows with trees only											
E1.	Tree class	There is more than one age-class)or morphology) of tree present (for example: young, mature, veteran and or ancient), and there is on average at least one mature, ancient or veteran tree present per 20 – 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.		0						
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.		1						
			Total Assessment Score and Condition:	4 - M	5 - M						

Other broadleaved woodland

Condition Sheet: WOODLAND Habitat Type																
UKHab Habitat Type(s)																
Woodland and forest - Lowland beech and yew woodland **Woodland and forest - Lowland mixed deciduous woodland** **Woodland and forest - Native pine woodlands** **Woodland and forest - Other coniferous woodland** **Woodland and forest - Other Scot's pine woodland** **Woodland and forest - Other woodland; broadleaved** **Woodland and forest - Other woodland; mixed** **Woodland and forest - Upland birchwoods** **Woodland and forest - Upland mixed ashwoods** **Woodland and forest - Upland oakwood** **Woodland and forest - Wet woodland**															
Condition Assessment Criteria																
				Individual Parcel Reference Numbers (W-)												
	Indicator	**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**												
1	**Age distribution of trees**	Three age classes present	Two age classes present	One age class present	0											
2	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	3											
3	**Invasive plant species**	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	3											
4	**Number of native tree species**	Five or more native tree or shrub species	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	3											

		found across woodland parcel														
5	**Cover of native tree and shrub species**	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	3											
6	**Open space within woodland**	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	3											
7	**Woodland regeneration**	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	2											
8	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high risk pest or disease present	3											
9	**Vegetation and ground flora**	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	1											
10	**Woodland vertical structure**	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	2											

11	**Veteran trees**	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	1											
12	**Amount of deadwood**	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	1											
13	**Woodland disturbance**	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	3											
				Total score (out of a possible 39)	**28**											
				Condition Assessment (P = poor, M = moderate and G = good)	**M**											

Condition Assessment Result	Condition Assessment Score
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)

Appendix C. Species list

Common name	Scientific name	Habitat Parcel/s recorded In
Field maple	*Acer campestre*	S6, W1, W3, W5, W7, W8, W11, W21
Sycamore	*Acer pseudoplatanus*	W1, W2, W5, W6, W7, W8 (SSSI woodland), W21, W22
Garlic mustard	*Alliaria petiolate*	W1, W6, W5, W7
Cow parsley	*Anthriscus sylvestris*	G1
Fescue sp.	*Festuca* sp.	G5, G7
False-oat grass	*Arrhenatherum elatius*	G1, G4, G5, G7, S7
Mugwort	*Artemisia vulgaris*	S7
Silver birch	*Betula pendula*	W1, W3, W6, W5
Creeping thistle	*Cirsium arvense*	G1, G4, G5
Dogwood	*Cornus sanguinea*	S8, W1, W3
Hazel	*Corylus avellana*	S8, W1, W3, W5, W8 (SSSI woodland), W8, W9, W22
Hawthorn	*Crataegus monogyna*	S8, S9, S11, W1, W2, W3, W6, W5, W8, W9, W11
Cock's-foot	*Dactylis glomerata*	G1, G4, G5, G7, G10, W7
Tufted hair-grass	*Deschampsia cespitosa*	G1
Greater willowherb	*Epilobium hirsutum*	G1
Meadowsweet	*Filipendula ulmaria*	G1
Ash	*Fraxinus excelsior*	S6, S8, W1, W3, W6, W5, W7, W8, W9, W11, W21, W22
Cleavers	*Galium aparine*	W1, W6, W5, W9
Meadow crane's bill	*Geranium pratense*	G1
Ivy	*Hedera helix* agg.	W1, W21, W22
Hogweed	*Heracleum sphondylium*	W1
Yorkshire fog	*Holcus lanatus*	S7, G5, G7
Holly	*Ilex aquifolium*	W1, W21
Perennial rye-grass	*Lolium perenne*	G4, G6, G7, G9, G10
Honeysuckle	*Lonicera periclymenum*	W1
Gypsywort	*Lycopus europaeus*	G1
Scots pine	*Pinus sylvestris*	W3, W21

Common name	Scientific name	Habitat Parcel/s recorded In
Ribwort plantain	*Plantago lanceolata*	G4, G9, G10
Fern	*Polypodiopsida* sp.	W1, W22
Wild cherry	*Prunus avium*	S8, W11, W4
Cherry laurel	*Prunus laurocerasus*	W9
Blackthorn	*Prunus spinosa*	S8, S9, S11
Pedunculate oak	*Quercus robur*	W3, W7, W22, W8
Bramble	*Rubus fruticosus* agg.	G1, G7, S6, S7, S8, S10, S12, W3, W5, W7, S12, W11, W21
Elder	*Sambucus nigra*	S6, W6, W5, W21, W22
Greater burnet	*Sanguisorba officinalis*	G1
Lime	*Tilia x europaea*	W6
White clover	*Trifolium repens*	G4, G9, G10
Gorse	*Ulex europaeus*	S7
Common nettle	*Urtica dioica*	G1, G5, G7, S7, W6, W5, W7, W21, W22
Common ragwort	*Senecio jacobeae*	G7, G10
Yarrow	*Achillea millefolium*	G4
Broadleaved dock	*Rumex acetosa*	G7
Dandelion	*Taraxacum*	G4, G7, G6, G9
Creeping buttercup	*Ranunculus repens*	G7, G10
Lime sp.	*Tilia* sp.	W5
Rhododendron	*Rhododendron ponticum*	W22, W21
Bluebells	*Hyacinthoides non-scripta*	W5, W7, W21
Horse chestnut	*Aesculus hippocastanum*	W21
London plane	*Platanus x hispanica*	W22
Willow sp.	*Salix* sp.	W2
Dock sp.	*Rumex* sp.	G5

Appendix D. MoRPh Photographs

Appendix Plate 1: A46 East, subreach A, taken from the right bank looking slightly upstream

Appendix Plate 2: A46 East, subreach A, taken from the right bank looking downstream and showing the A46 culvert

Appendix Plate 3: Smite Brook A46 to B4082 section within the Order Limits, taken from the right bank facing upstream.

Appendix Plate 4: Smite Brook A46 to B4082 subreach B, module 5, taken from the B4082 bridge facing upstream.

Appendix Plate 5: approximate 5m section of Smite Brook B4082 to the River Sowe subreach A visible from B4082 bridge

Appendix E. Detailed MoRPh results

Reach	Subreach	Survey Type	Bank Top Vegetation Structure	Bank Top Tree Feature Richness	Bank Top Water-related Features	Bank Top Non-native Invasive Species Cover	Bank Top Managed Ground Cover	Bank Face Riparian Vegetation Structure	Bank Face Tree Feature Richness	Bank Face Natural Bank Profile Extent	Bank Face Natural Bank Profile Richness	Bank Face Natural Bank Material Richness	Bank Face Bare Sediment Extent	Bank Face Artificial Bank Profile Extent	Bank Face Reinforcement Extent	Bank Face Reinforcement Material Severity	Bank Face Invasive Non-native Species Cover	Channel Margin Aquatic Vegetation Extent	Channel Margin Aquatic Morphotype Richness	Channel Margin Physical Feature Extent	Channel Margin Physical Feature Richness	Channel Margin Artificial Features	Channel Aquatic Morphophyte Richness	Channel Bed Tree Features Richness	Channel Bed Hydraulic Features Richness	Channel Bed Natural Features Extent	Channel Bed Natural Features Richness	Channel Bed Material Richness	Channel Bed Siltation	Channel Bed Reinforcement Extent	Channel Bed Reinforcement Severity	Channel Bed Artificial Features Severity	Channel Bed Invasive Non-native Species Cover	Channel Bed Filamentous Algae Extent
Smite Brook A46 East	A	Pre-con, post-con	1	0	0	0	0	1	1	3	1	1	4	0	-3	-3	0	3	1	1	1	0	1	1	1	0	0	2	-4	0	0	0	0	0
Smite Brook A46 to B4082	A	Pre-con	1	2	0	-1	-2	1	2	0	0	1	0	0	0	0	-3	3	1	2	1	0	2	1	1	0	0	2	-4	0	0	0	0	0
	B	Pre-con	1	2	0	-1	-1	1	1	3	4	1	4	0	-3	-2	0	1	1	1	1	0	2	2	1	0	0	3	-4	0	0	-3	-2	0
Smite Brook B4082 to the River Sowe	A	Pre-con	1	2	0	-2	0	1	0	1	2	1	2	0	-2	-2	-3	0	0	2	1	0	1	2	0	0	0	2	-4	0	0	-4	0	0