

Biodiversity Net Gain Assessment



Padbury Brook Solar Farm, Bicester, Oxfordshire

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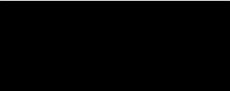
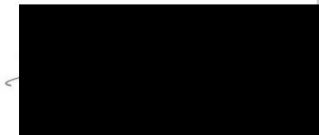
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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

Revision History

Revision	Date	Amendment
01	11/11/2022	First issue
02	24/11/2022	Update to planting scheme

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1 Introduction

1.1 Background and Objectives

ADAS was commissioned to undertake a biodiversity net gain assessment for a solar farm development at an area of land near Stratton Audley, Bicester, Oxfordshire, OX27 9BE. A Phase 1 habitat survey and Preliminary Ecological Appraisal (PEA) report were completed by Western Ecology in January and July 2022, respectively (Western Ecology, 2022a). A further baseline conditions assessment was conducted by ADAS in October 2022. This baseline habitat data has been used to assess the change in biodiversity before and after development.

Biodiversity net gain occurs in development when the project leaves the natural environment in a better state than it was prior to the project. To achieve biodiversity net gain, the developer is required to ensure that wildlife habitats are created or enhanced. It requires the development to result in a demonstrable increase in habitat value to the baseline (how the site was prior to development). Biodiversity net gain should be demonstrated quantitatively.

To demonstrate biodiversity net gain, the value of the habitats are assessed using a recognised metric tool to calculate biodiversity units. The biodiversity losses or gains resulting from the development are then calculated by subtracting the baseline (pre-development) units from the post development units. Defra's Biodiversity Metric 3.1 Calculation tool (Natural England, 2021) has been used to demonstrate biodiversity net gain in a quantitative manner.

The *Biodiversity Net Gain Good Practice Principles for Development* (CIEEM, CIRIA IEMA 2016) are a set of ten principles which have been used to provide a framework that helps improve the UK's biodiversity by contributing towards strategic priorities to conserve and enhance nature while progressing with sustainable development. To demonstrate that biodiversity net gain has been achieved in a qualitative manner for a development it would need to be shown that the development meets these ten principles which have been listed below:

- Apply the mitigation hierarchy
- Avoid losing biodiversity that cannot be offset by gains elsewhere
- Be inclusive and equitable
- Address risks
- Make a measurable net gain contribution
- Achieve the best outcomes for biodiversity
- Be additional

- Create a net gain legacy
- Optimise sustainability
- Be transparent

1.2 Site Description

The approximately 58-hectare (ha) area of land proposed for development (hereafter referred to as ‘the site’) lies approximately 0.8 kilometres (km) southwest of the village of Stratton Audley and approximately 3.7 km southwest of the town of Bicester, Oxfordshire (Grid Reference: SP 623 272). The Phase 1 Habitat Survey described the development site as an area of agricultural land comprised of seven field compartments under arable rotation. At the time of the PEA survey in January 2022 and baseline condition assessment in October 2022, the site was sown with autumn/ winter cereal crops with occasional areas of unvegetated bare ground. Some field compartments contained large winter bird food plots at the margins, consisting of seed-bearing plants including Millet (*Pennisetum sp.*), Quinoa (*Chenopodium sp.*) and Thistles (*Cirsium spp.*) (Western Ecology, 2022a).

Native-species hedgerows were present around the site boundary and between field compartments. The hedgerows were comprised predominantly of Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Field Maple (*Acer campestre*) and Field Elm (*Ulmus minor*). Several hedgerows contained frequent mature and semi-mature trees such as Pedunculate Oak (*Quercus robur*) and Ash (*Fraxinus excelsior*). The site’s northwest boundary was comprised of woodland edge. Modified grassland was present within field margins and was comprised of species such as Perennial Rye-grass (*Lolium perenne*), Cock’s-foot (*Dactylis glomerata*), Dandelion (*Taraxacum officinale*) and White Clover (*Trifolium repens*) in a uniformly short sward. These areas of grassland were generally associated with public rights of way and consequently featured some damage from footfall.

The PEA identified three ponds immediately adjacent to the site boundary, which were all found to be dry or mostly dry during further survey in June 2022 (Western Ecology, 2022b). The Phase 1 Habitat Plan (Appendix 1) details all habitats found on site (Western Ecology, 2022a).

The site boundary included within the Phase 1 Habitat map produced by Western Ecology (Appendix 1) has since been revised as the field compartment on the southwest of the site is no longer included. The updated site boundary is shown in the post-development plans in Appendix 2. As the baseline condition assessments were based on the Phase 1 Habitat map, some areas were removed from the calculations (Hedgerow 5 was removed completely, Hedgerow 4 was reduced in length and the total area of cropland was reduced).

1.3 Proposed Development

The proposed development is for the installation and operation of a 44-Megawatt (MW) solar farm with associated infrastructure and battery storage. This will include the installation of solar panels throughout the site. The solar arrays will lie within seven compound areas which total 49.32 ha, all of which will be surrounded by deer fence. A hardstanding maintenance track will run throughout the site, outside of the solar array compounds, from the southwest to the site's northern boundary. An overhead cable line will run diagonally across the three northernly compound areas. Closed-circuit television (CCTV) cameras will be installed throughout the site and inverters, inverter containers and spare containers will be installed adjacent to the maintenance track in multiple locations.

The native-species hedgerows present on site will be retained in the proposed development, with deer fences to be installed between the solar arrays and grassland field margins.

1.4 Local Planning Policy

Table 1 details the policies within The Adopted Cherwell Local Plan 2011-2031 (Part 1) which are relevant to the ecological features on site.

Table 1: Summary of relevant local planning policy – The Adopted Cherwell Local Plan 2011-2031 (Part 1)

Policy	Description
Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment	<p>Protection and enhancement of biodiversity and the natural environment will be achieved by the following:</p> <ul style="list-style-type: none">• In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources• The protection of trees will be encouraged, with an aim to increase the number of trees in the District• The reuse of soils will be sought• If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then development will not be permitted.• Development which would result in damage to or loss of a site of international value will be subject to the Habitats Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated• Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity

Policy	Description
	<ul style="list-style-type: none"> • Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity • Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity • Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value • Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution • Planning conditions/obligations will be used to secure net gains in biodiversity by helping to deliver Biodiversity Action Plan targets and/or meeting the aims of Conservation Target Areas. Developments for which these are the principal aims will be viewed favourably • A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management.

2 Methods

2.1 Baseline Habitat Assessment

This assessment was carried out as a combination of a desk-based exercise, using the results of the Western Ecology Phase 1 Habitat survey carried out in January 2022 (Western Ecology, 2022a), and a baseline condition assessment conducted by ADAS Assistant Ecological Consultant Nicola Ford MBiolSci in October 2022.

Many recognised habitat assessment methods are available for site surveys and the PEA has used the JNCC Phase 1 habitat assessment method. During the baseline condition assessment conducted in October 2022, the Phase 1 habitat types were converted to the appropriate habitats in UK Habitat (UK Habs) Classification method (UK Habs, 2022). Habitat conditions were then assessed on-site using the DEFRA Biodiversity Metric 3.1 Habitat Condition Assessment Sheets.

Biodiversity units were calculated for the site using the “Biodiversity Metric 3.1 - Calculation Tool” and guidance available on the Natural England website (Natural England, 2022). A full description of the methods used are provided in Appendix 3. The Biodiversity Metric calculation tool spreadsheet is provided as an Excel file with this report in Appendix 4 and completed Habitat Condition Assessment Sheets for each baseline habitat are provided in Appendix 5.

2.2 Limitations

Measurements are based on a two-dimensional mapping system and would assume the site is completely flat and therefore certain habitats may actually be greater in extent if they occur on a slope.

In the field the surveyor will have judged the approximate location and area of each of the habitat types and, where appropriate, used aerial imagery to assist with mapping of the habitats as accurately as possible. Any differences in areas identified at detailed design have been added to the baseline habitat area as an addition to the dominant habitat type.

3 Results

Full details of the existing habitats and linear features assessed in this report are provided in the Western Ecology 2022 PEA report.

3.1 Baseline Habitat Assessment

The baseline biodiversity units of the proposed development site have been calculated and are summarised in Table 2 below and included in the biodiversity metric in Appendix 4. The condition of each habitat has been assessed against the relevant condition assessment criteria within the Defra Metric 3.1.

Table 2: On-site baseline biodiversity unit assessment

Phase 1 Habitat	UK Habs Classification	Area (ha)	Retained Area (ha)	Distinctiveness	Condition	Strategic significance	Total habitat units
J1.1 Cultivated Land - Arable	Cropland – cereal crops	55.84	0	Low	N/A	Location ecologically desirable but not in local strategy	122.85
B2.2 Semi-improved Grassland	Grassland – Modified grassland	2.21	0	Low	Moderate	Location ecologically desirable but not in local strategy	9.72
Area Total		58.05	0				132.57
Phase 1 Habitat	Linear type (terrestrial)	Length (km)	Retained (km)	Distinctiveness	Condition	Strategic significance	Total linear units
J2 Hedgerow	Hedgerow 1- Native hedgerow with trees associated with ditch	0.38	0.38	High	Moderate	Formally identified in local strategy	5.24
J2 Hedgerow	Hedgerow 2- Native species-rich hedgerow with trees-associated with ditch	0.73	0.73	Very High	Good	Formally identified in local strategy	20.15

J2 Hedgerow	Hedgerow 3- Native species-rich hedgerow with trees-associated with ditch	0.23	0.23	Very High	Good	Formally identified in local strategy	6.35
J2 Hedgerow	Hedgerow 4- Native species-rich hedgerow with trees-associated with ditch	0.79	0.79	Very High	Good	Formally identified in local strategy	21.80
J2 Hedgerow	Hedgerow 6- Native hedgerow-associated with ditch	0.14	0	Medium	Good	Formally identified in local strategy	1.93
J2 Hedgerow	Hedgerow 7- Native species-rich hedgerow with trees	0.20	0.20	High	Moderate	Formally identified in local strategy	2.76
J2 Hedgerow	Hedgerow 8- Native species-rich hedgerow	0.42	0	Medium	Good	Formally identified in local strategy	5.80
J2 Hedgerow	Hedgerow 9- Native species-rich hedgerow with trees-associated with a ditch	0.36	0.36	Very High	Moderate	Formally identified in local strategy	6.34
J2 Hedgerow	Hedgerow 10- Native species-rich hedgerow associated with a ditch	0.44	0	High	Good	Formally identified in local strategy	9.11
J2 Hedgerow	Hedgerow 11- Native hedgerow	0.22	0	Medium	Good	Formally identified in local strategy	3.04

	associated with a ditch						
J2 Hedgerow	Hedgerow 12- Native species-rich hedgerow associated with a ditch	0.3	0	High	Moderate	Formally identified in local strategy	4.14
J2 Hedgerow	Hedgerow 13- Native hedgerow	0.4	0	Low	Moderate	Formally identified in local strategy	1.84
J2 Hedgerow	Hedgerow 14- Native hedgerow associated with a ditch	0.25	0	Medium	Good	Formally identified in local strategy	3.45
J2 Hedgerow	Hedgerow 15- Native hedgerow	0.3	0	Low	Moderate	Formally identified in local strategy	1.38
Linear Total		5.16					93.32

3.2 Biodiversity Metric Calculation

The proposed habitats are based on the development plan in Appendix 2 and fully detailed in the Defra metric in Appendix 4. Table 3 summarises the findings and provides details on habitats that were created or enhanced, including any buildings or hardstanding associated with the works.

Table 3: On-site habitat creation and enhancement biodiversity unit assessment

UK Habs Classification	Area (ha)	Distinctiveness	Condition	Strategic significance	Habitat units delivered
Creation					
Urban - Developed land; sealed surface (Buildings and infrastructure)	1.29	Very Low	N/A	Area/compensation not in local strategy/ no local strategy	0.00

Grassland – other neutral grassland (Grazing Meadow Mix)	49.27	Medium	Moderate	Location ecologically desirable but not in local strategy	362.83
Grassland – other neutral grassland (General Meadow Mix)	7.49	Medium	Moderate	Location ecologically desirable but not in local strategy	55.16
Total	58.05	-	-	-	417.99
Linear type (terrestrial)	Length (km)	Distinctiveness	Condition	Strategic significance	Habitat units delivered
Creation					
Native hedgerow with trees	1.28	Medium	Moderate	Formally identified in local strategy	8.25
Line of trees (Ecologically Valuable)	1.54	Medium	Moderate	Location ecologically desirable but not in local strategy	6.95
Total	2.82	-	-	-	15.19
Enhancement					
Hedgerow 6- Native hedgerow with trees associated with a ditch	0.14	Medium-High	Good	Formally identified in local strategy	2.61
Hedgerow 8- Native species-rich hedgerow with trees	0.42	Medium-High	Good	Formally identified in local strategy	7.83
Hedgerow 10- Native species-rich hedgerow with trees associated with a ditch	0.44	High-Very High	Good	Formally identified in local strategy	11.23
Hedgerow 11- Native hedgerow with trees associated with a ditch	0.22	Medium-High	Good	Formally identified in local strategy	4.10
Hedgerow 12- Native species-rich hedgerow with trees associated with a ditch	0.3	High-Very High	Moderate	Formally identified in local strategy	5.11
Hedgerow 13- Native hedgerow with trees	0.4	Low-Medium	Moderate	Formally identified in local strategy	3.13

Hedgerow 14- Native hedgerow with trees associated with a ditch	0.25	Medium-High	Good	Formally identified in local strategy	4.66
Hedgerow 15- Native hedgerow with trees	0.3	Low-Medium	Moderate	Formally identified in local strategy	2.35
Total	2.47	-	-	-	41.01

3.2.1 Summary of Habitat Changes

The total baseline biodiversity habitat units of the proposed development site are 132.57 units. The development will result in the loss of 122.85 units (55.84 ha) of arable cropland of low distinctiveness and 9.72 units (2.21 ha) of modified grassland of low distinctiveness. Neither of these baseline habitats will be retained, resulting in a loss of these 132.57 units. Post-construction, 362.83 units (49.27 ha) of other neutral grassland (grazing meadow mix) of medium distinctiveness will be created within solar array compounds and a further 55.16 units (7.49 ha) of other neutral grassland (general meadow mix) also of medium distinctiveness will be created outside the solar array compounds to compensate for the loss of low distinctiveness cropland and modified grassland. The development will also create 1.29 ha of hardstanding of very low distinctiveness, which does not generate habitat units. This equates to a total of 417.99 habitat units (with rounding as per the Defra metric) post-development.

This will result in a **net change of 285.41 habitat units, which represents a 215.29 % net gain.**

The total baseline linear habitat units of the site are 93.32 hedgerow units (5.16 km), comprised of 14 distinct hedgerows varying from moderate to good condition and from low to very high distinctiveness. All existing hedgerows will be retained and protected during the construction phase of the development. Post-construction, 41.01 units (2.47 km) will be managed and enhanced through planting native tree and shrub species to achieve better distinctiveness. A further 10.23 units (1.74 km) of new hedgerow of medium distinctiveness will be created, comprised of 1.28 km of native hedgerow with trees and new lines of trees which total 1.54 km. This equates to a total of 118.84 hedgerow units post-development.

This will result in a **net change of 25.52 hedgerow units, which represents a 27.34 % net gain.**

A screenshot of the headline results within the biodiversity metric is shown in the Table 4 below.

Table 4: Summary of Biodiversity Metric 3.1 results

On-site baseline	<i>Habitat units</i>	132.57
	<i>Hedgerow units</i>	93.32
	<i>River units</i>	0.00
On-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	<i>Habitat units</i>	417.99
	<i>Hedgerow units</i>	118.84
	<i>River units</i>	0.00
On-site net % change <small>(Including habitat retention, creation & enhancement)</small>	<i>Habitat units</i>	215.29%
	<i>Hedgerow units</i>	27.34%
	<i>River units</i>	0.00%
Off-site baseline	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total net unit change <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	<i>Habitat units</i>	285.41
	<i>Hedgerow units</i>	25.52
	<i>River units</i>	0.00
Total on-site net % change plus off-site surplus <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	<i>Habitat units</i>	215.29%
	<i>Hedgerow units</i>	27.34%
	<i>River units</i>	0.00%
Trading rules Satisfied?	Yes ✓	

4 Habitat Management Objectives

The following management objectives give details on how post-construction habitats can achieve the target conditions that the assessment has been based on. Details of protection measures during development and long-term management will be provided in a Landscape and Ecology Management Plan. Retained hedgerows will be maintained and protected throughout the works.

4.1 Enhanced Features

4.1.1 Hedgerows

Existing hedgerows will be planted with native tree species to improve the habitat distinctiveness. For example, Hedgerow 13 would be re-categorised from Native Hedgerow to Native Hedgerow with trees, thus moving from Low to Medium distinctiveness. A total of 128 trees are proposed to be planted within existing and new hedgerows. This includes species such as Field Maple, oak, Common Lime (*Tilia x europaea*) and Crab Apple (*Malus sylvestris*). The condition of the retained hedgerows will also be improved within ten years through additional native species planting, to reduce gaps and increase species richness.

4.2 Created Features

4.2.1 Native Hedgerow with Trees

A native hedgerow with trees will be planted in the most northerly field compartment, alongside the proposed maintenance track. The hedgerow will be planted using multiple native shrub and tree species and will be managed to achieve moderate condition within ten years.

4.2.2 Line of trees (ecologically valuable)

A line of mature trees is proposed to be planted at 15-20 m intervals parallel to Hedgerow 6 and 7 and along the eastern boundary of five of the solar compounds. A total of 251 native trees are proposed to be planted within lines of trees across the site. Planted trees are expected to reach full ecological value within 20 years.

4.2.3 Grassland - Other neutral (outside solar array fence line)

Existing arable cropland and modified grassland will be replaced with species rich grassland outside the proposed solar array compounds. These areas will be planted with Emorsgate EM2 'General Purpose Meadow Mix' sown at 4 g/ m². An existing footpath and permissive footpath will run through this habitat on the site's northern and eastern boundary and so a target condition of moderate has been set due to

likelihood of footfall damage. This area of grassland will be managed to achieve moderate condition within five years.

4.2.4 Grassland - Other neutral (inside solar array fence line)

Existing arable cropland will be replaced with grazing meadow grassland inside the proposed solar array compounds. These areas will be planted with Habitat Aid 'Grazing Meadow Seed Mix' or similar, sown at 4 g/ m² and managed to achieve moderate condition within five years.

4.3 Recommended Monitoring and Management

An appropriate Biodiversity Net Gain Management and Monitoring Plan will need to be prepared for the site to ensure that the goals for habitat enhancement and creation are achieved.

This plan should detail:

- Measures to protect biodiversity features on site that are to be retained;
- where, when and how the proposed on-site biodiversity compensation/enhancement will be undertaken, monitored in the long term (up to 30 years) and modified, when needed, to achieve the stated objectives for the site;
- persons responsible for implementing and funding the works; and
- any requirements for ongoing updates to the Local Planning Authority that demonstrate the management of the site, how management is meeting the objectives or where appropriate changes in management have been advised.

5 Conclusion

Padbury Brook Solar Farm is proposed for development in a 58.05 ha area of land southwest of Stratton Audley, Bicester, Oxfordshire. The development will result in the loss of 55.84 ha of arable cropland of low distinctiveness and 2.21 ha of modified grassland of low distinctiveness. All 5.16 km of existing hedgerow on site will be protected during development.

Post-construction, 56.76 ha will be replanted with ecological habitats of equal or greater distinctiveness (neutral grassland). A total of 1.29 ha will be lost to new developed land and sealed surfaces. The proposed development design also includes plans for creation of a new native hedgerow with trees, 1.28 km in length as well as the creation of 1.54 km in total of new lines of trees.

The current development design is expected to result in a net habitat unit change of **285.41 habitat units, which represents a 215.29 % net gain** and a net linear unit change of **25.52 hedgerow units, which represents a 27.34 % net gain.**

The unit calculation scores for post-development are based on expected conditions of the proposed habitats; a management and monitoring plan will need to be produced and followed to ensure the required conditions are attained and the unit gains are achieved.

6 References

ADAS (2022) *Biodiversity Metric 3.1 Padbury Brook BNG calculation tool.*

Joint Nature Conservation Committee (JNCC) (2010). Handbook for Phase 1 Habitat Survey. A technique for environmental audit (reprint). Joint Nature Conservation Committee, Peterborough.

Natural England (2022) (Alvarez M, Butcher B, Heaver M, Heydon M, Mayhew E, Newsome A, Panks S, Potter J, Russell T, Scott SJ, Scott SH, Stone D, Treweek J, White N (Dec 2019) *The Biodiversity Metric 3.1: auditing and accounting for biodiversity value - User guide.*

Natural England (2022) (Alvarez M, Butcher B, Heaver M, Heydon M, Mayhew E, Newsome A, Panks S, Potter J, Russell T, Scott SJ, Scott SH, Stone D, Treweek J, White N (Dec 2019) *The Biodiversity Metric 3.0: auditing and accounting for biodiversity value – Technical supplement.*

Natural England (2022) The Biodiversity Metric 3.1 – Calculation Tool.

The British Standard Institute (2013) *BSI Standards Publication, BS 42020:2013 Biodiversity — Code of practice for planning and development.*

The British Standard Institute (2013) *BSI Standards Publication, BS 8683:2021 Process for designing and implementing Biodiversity Net Gain — Specification.*

UK HABS (2022) The UK Habitat Classification: Habitat Definitions. Version 1.1.

Western Ecology (2022a) Preliminary Ecological Appraisal Padbury Brook Solar Farm, Bicester, Oxfordshire July 2022.

Western Ecology (2022b) Great Crested Newt Survey Report Padbury Brook Solar Farm, Bicester, Oxfordshire July 2022.

Appendix 1: Phase 1 Habitat Survey Plan

See following page.

Appendix 2: Proposed Development

See following page

Appendix 3: Biodiversity Metric Calculation Methods

Biodiversity units were calculated for the site using the “Biodiversity Metric 3.1 - Calculation Tool” and guidance available on the Natural England website (Natural England, 2022). The Biodiversity Metric calculation tool spreadsheet is provided as an Excel file with this report.

The metric uses area (and length for linear habitat features) of habitats as a proxy measure for capturing the value and importance of biodiversity. It uses a calculation in MS Excel to allow for the ecological importance of these features: their size, ecological condition, distinctiveness and location. The metric enables assessments to be made of the baseline (pre-intervention) biodiversity value of a site in terms of ‘biodiversity units’ and the projected post-development (post-intervention) biodiversity value. The metric can also be used to measure off-site biodiversity changes for a project or development and can be applied from the level of an individual field to, for example, an entire river catchment.

The calculator uses the following variable elements to determine biodiversity units, based on the information collected in the field:

Habitat type: The original survey was based on the Phase 1 methods (JNCC 2010) for categorising a habitat identified in the field. The Biodiversity Metric 3.1 uses the UK Habitat (UK Habs) classification system. Provided within the Biodiversity Metric 3.1 is a translation table to convert habitat types from Phase 1 terminology to UK Habs; ADAS used this conversion in undertaking this assessment.

Area (Hectares): The area of each baseline habitat type has been measured based on the digitized Phase 1 map using ArcView Geographical Information System (GIS). Measurements have been rounded up or down to the nearest two decimal places to achieve a minimal mapping unit (MMU) of 0.01ha. Mapping habitats at different times of year may lead to variation into where one habitat starts and another begins as there is potential overlap between habitats (the ecotone). The actual field mapping was based on both field survey and aerial imagery in order to achieve the best representation of the areas covered by each habitat identified onsite. The areas for the post development site habitats were taken from a DWG version of the development plan.

Condition: The condition is a means to measure the quality of a habitat based on a series of physical characteristics and typical species of a particular habitat type. In order to aid the process, the Biodiversity Metric 3.1 Technical Supplement and Biodiversity Metric 3.1 – habitat condition assessment sheets with instructions (Natural England, 2022), provides ‘condition sheets’. Condition sheets provide a list of positive indicators for each habitat and dependent on how many positive indicators a particular habitat meets will equate to the relevant condition for that specific habitat.

Distinctiveness: This element considers the total amount of a habitat in a national context, the proportion of the habitat protected in Sites of Special Scientific Interest (SSSIs), whether the habitat is a UK Priority Habitat and how rare the habitat is in a European context. Certain Very High distinctiveness habitats are considered irreplaceable due to their age, complexity or rarity in the landscape. Replacement or enhancement of baseline habitats as a result of development must meet the trading rules as set by the metric. A development proposal which does not meet these trading rules must justify this and reach an agreement with the Local Planning Authority and relevant stakeholders.

Strategic significance: This element recognises that strategic significance gives extra value to habitats that are located in optimal locations, or are of a type, that meet local objectives for biodiversity. Strategic significance relates to the spatial location of a habitat parcel and works at a landscape scale. Information to determine the significance of a habitat within a specific landscape can be found in a variety of sources that include: local biodiversity plans, Local Nature Recovery Strategies, Local Ecological Networks and National Character Area objectives. The strategic significance is based on three categories which equates to a different score, which are as follows: Within area formally identified in local strategy – 1.15; Location ecologically desirable but not in local strategy – 1.1 and Area/compensation not in local strategy/no local strategy - 1.

Appendix 4: Biodiversity Metric

See accompanying excel spreadsheet.

Appendix 5: Baseline Habitat Condition Assessment Sheets

See following pages

Grassland - Modified grassland			
Site name/location	Padbury Brook	Onsite/offsite	Onsite
Central grid reference of habitat		Unique polygon reference	
Limitations (if applicable)		Metric 3.0 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	
Habitat Description			
Modified grassland associated with field margins and public footpaths. Evidence of tyre marks and damage from footfall.			
See UKHab			
Condition Assessment Criteria		Condition Achieved (Y/N)	Notes/Justification
1	There must be 6-8 species per m2. If a grassland has 9 or more species per m2 it should be classified as a medium distinctiveness grassland habitat type. NB - this criterion is essential for achieving moderate condition.	Y	approx 6 species within m2. Species included Perennial Ryegrass, Cock's-foot, Dandelion and White Clover
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	uniformly short sward height (<7cm)
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.	Y	
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	N	footfall damage and tyre marks throughout, particularly across eastern boundary
5	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	Y	
6	Cover of bracken less than 20%.	Y	
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).	Y	
Essential criterion 1 achieved (Y/N)			
		Number of criteria passed	
Condition Assessment Result	Condition Assessment Score	Score Achieved x/✓	
Passes 6 or 7 of 7 criteria including passing essential criterion 1	Good (3)		
Passes 4 or 5 of 7 criteria including passing essential criterion 1	Moderate (2)	Yes (5/7)	
Passes 0, 1, 2 or 3 of 7 criteria; OR 4, 5 or 6 of criteria but failing criterion 1	Poor (1)		
Suggested enhancement interventions to improve condition score			
introduction of herb species, sward height allowed to grow in some areas, reduce damage from human activity			

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62858 27788	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 1	
Habitat Description				
Native hedgerow with trees associated with a ditch. Species include blackthorn, hawthorn, dogrose, willow and bramble with mature oak trees.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx. 2 m height along whole length
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*).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	Y	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N	
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.	Y	
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).	N	heavy footfall from public footpath in undisturbed ground and some litter in hedge
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.	N	
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.	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62838 25730	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 2	
Habitat Description				
Native species rich hedgerow with trees associated with a ditch. Species include dogrose, blackthorn, hawthorn, ash and willow with mature oak and ash trees.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx. 3 m height along whole length
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*).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	Y	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	
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.	Y	
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.	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62627 26693	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 3	
Habitat Description				
Native species rich hedgerow with trees associated with a ditch. Species include dogrose, elder, field elm, willow, hawthorn and bramble with mature oak and ash trees.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx. 2.5 m height along whole length
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*).	Y	Approx. 2.5 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	Y	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	
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.	N	Less than one mature tree per 30 m
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.	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite
Habitat's central grid reference	SP 62303 26773	Unique polygon reference(s)	
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 4
Habitat Description			
Native species rich hedgerow with trees associated with a ditch. Species include dogrose, hawthorn, field elm and bramble with mature ash and oak trees.			
See Table TS1-3 of the Technical Supplement.			
Condition Assessment Criteria			
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.			
Hedgerow favourable condition attributes			
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)
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).	Y
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*).	Y
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).	Y
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).	Y
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y
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.	Y
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).	Y
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.	Y
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.	Y

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62248 27140	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 6	
Habitat Description				
Native hedgerow associated with a ditch. Species include dogrose, hawthorn, blackthorn and bramble				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2 m height along whole length
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).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	Y	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite
Habitat's central grid reference	SP 62329 27575	Unique polygon reference(s)	
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 7
Habitat Description			
Nativespecies rich hedgerow with rees. Species include goat willow, blackthorn, field elm, hobblesh, oak, field maple, dogrose with mature oak trees.			
See Table TS1-3 of the Technical Supplement.			
Condition Assessment Criteria			
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.			
Hedgerow favourable condition attributes			
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)
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).	Y
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*).	Y
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).	Y
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).	Y
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N
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.	Y
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).	Y
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.	N
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.	Y

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62424 27672	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 8	
Habitat Description				
Native species rich hedgerow. Species include blackthorn, hawthorn, oak, field maple and dogrose.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 3.5 m height along whole length
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).	Y	Approx. 1.5 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	Narrow gap between hedge and arable land
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite
Habitat's central grid reference	SP 62497 27817	Unique polygon reference(s)	
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 9
Habitat Description			
Native species rich hedgerow with trees associated with a ditch. Species include blackthorn, hawthorn, field elm, oak, dogrose and willow.			
See Table TS1-3 of the Technical Supplement.			
Condition Assessment Criteria			
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.			
Hedgerow favourable condition attributes			
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)
Notes/Justification			
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).	Y
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*).	Y
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).	Y
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).	Y
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N
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.	Y
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).	Y
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.	Y
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.	Y

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62812 27498	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 10	
Habitat Description				
Native species rich hedgerow associated with a ditch. Species include blackthorn, hawthorn, field elm, oak, dogrose and willow.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2.5 m height along whole length
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).	Y	Approx. 1.5 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	Narrow gap between hedge and arable land
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62474 27427	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 11	
Habitat Description				
Native hedgerow associated with a wet ditch. Species include blackthorn, hawthorn, field elm, dogrose and bramble.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2 m height along whole length
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).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	Y	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62338 27261	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 12	
Habitat Description				
Native species rich hedgerow associated with a ditch. Species include blackthorn, hawthorn, ash, dogrose dogwood, oak and bramble.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2.5 m height along whole length
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).	Y	Approx. 1.5 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62583 26997	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 13	
Habitat Description				
Native hedgerow. Species include blackthorn, hawthorn, dogrose, willow, field elm, bramble				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2 m height along whole length
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).	Y	Approx. 1.5 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 62327 26858	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 14	
Habitat Description				
Native hedgerow associated with a ditch. Species include blackthorn, hawthorn, dogrose and bramble				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2 m height along whole length
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).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N	
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.	Y	
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).	Y	

Site name/Location	Padbury Brook	Onsite/offsite	Onsite	
Habitat's central grid reference	SP 61607 26982	Unique polygon reference(s)		
Limitations (if applicable)		Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	Hedgerow 15	
Habitat Description				
Native hedgerow. Species include blackthorn, hawthorn, dogrose, willow and bramble.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition')	Description	Condition Achieved (Y/N)	Notes/Justification
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).	Y	Approx 2 m height along whole length
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).	Y	Approx. 2 m wide across the whole length
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).	Y	
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).	Y	
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 hedge. Undisturbed ground should be 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 hedge. This criterion recognises the value of the hedge 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.	N	
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 (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	N	
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.	Y	
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).	Y	