



Old Monmouth Road, Longhope

Biodiversity Net Gain Assessment

On behalf of Stephen and Jean Waters

Project Code: BB2023013Bv1

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1 Introduction

1.1 Scope

- 1.1.1. Wild Service was commissioned by Stephen and Jean Waters to undertake a Preliminary Ecological Appraisal (PEA) and a Biodiversity Net Gain (BNG) Assessment of a parcel of land adjacent to The Sanctuary, Old Monmouth Road, Longhope, GL17 0NZ (hereafter referred to as the 'Site'). Details and results of the PEA can be found in the PEA report (Wild Service, June 2023). The survey was requested to inform the scheme and calculate the BNG of the proposed ecological interventions of the Site.
- 1.1.2. The scope of the project includes construction of a new two-bedroom ground floor dwelling and associated soft landscaping. The following habitat enhancement and restoration measures are proposed for the Site: the creation of grassland at moderate condition and additional tree planting and creation of native vegetated garden (Miller Howard Workshop, 2023).
- 1.1.3. The BNG Assessment comprised a UKHab Survey, condition assessment of habitats and completion of the Department for Environment, Food and Rural Affairs (Defra) Metric 4.0, which provides a summary of the BNG calculations undertaken at the Site.

1.2 Site Description

- 1.2.1 The Site comprised the existing garden area to the north-west of an existing residential building "The Sanctuary". It was located within Longhope village in west Gloucestershire, situated within the Forest of Dean. It comprised a well-manicured garden of modified grassland, a raised water feature, introduced shrubs, scattered trees and a native hedgerow (Figure 1.1). Old Monmouth Road bordered the north-east Site boundary. Immediately to the north-west and south-east were residential homes and gardens, and to the south-west there was a large field used for grazing animals.
 - 1.2.2 The surrounding landscape included the residential houses and gardens in Longhope village, and the wider area comprised arable fields and boundary hedgerows. There was a small linear woodland approximately 60m south of the Site, and the closest large woodland block was approximately 450m north-east of the Site. A watercourse (Longhope Brook) passed the Site approximately 100m to the south-west.
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1.2.3 The central Ordnance Survey Grid Reference for the Site was SO 69034 18778.

1.3 **Legislation**

1.3.1 This report has been prepared in accordance with relevant legislation and policy. Further detail is provided in Appendix 1, however the following primary documents are of relevance:

- The Wildlife and Countryside Act 1981 (as amended) (WCA 1981);
- The Countryside and Rights of Way Act 2000 (as amended) (CRoW Act 2000);
- The Natural Environment and Rural Communities Act 2006 (NERC Act 2006);
- The Protection of Badgers Act 1992 (PBA 1992);
- The Conservation of Habitats and Species Regulations 2017 (as amended) (CHS 2017); and
- The Environment Act 2021. This contains provisions for the protection and improvement of the environment, including introducing BNG.

1.3.2 No part of this report should be considered as legal advice and when dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

2 Methods

2.1 UKHab Survey

2.1.1 The methods used for the UKHab Survey are outlined in Table 1.

2.1.2 Becca Brown of Wild Service undertook the UKHab Survey on 26th April 2023 to identify habitat types on Site and to assess their condition as described below.

2.2 Biodiversity Net Gain Assessment

2.2.1 UKHab classifications were used to calculate BNG using the current version of the Defra Metric (4.0) for pre and post development calculations. Post development interventions were informed by the latest landscaping proposals for the Site (Miller Howard Workshop, May 2023; see Figures 1.2 and 2). Assessment of habitat condition was undertaken on 26th April 2023 during the ecological appraisal (Wild Service, June 2023). Habitat condition was assigned following guidance from the 'Technical Annex 1' document (Natural England, 2023) which accompanies the Biodiversity Metric 4.0 Assessment criteria. The full condition assessment results for the relevant habitats for this Site are included in Appendix 3.

2.2.2 This BNG Assessment used the following industry recognised best practice methodologies:

- CIEEM, IEMA and CIRIA (2016). Biodiversity Net Gain: Good Practice Principles for Development; and
- Natural England (2023). Biodiversity Metric 4.0 – Auditing and Accounting for Biodiversity.

2.2.3 Applying these standardised methods results in the calculation of a baseline biodiversity value, a post-development biodiversity value and a net change in biodiversity value associated with the proposed development.

2.2.4 Gloucestershire Local Nature Partnership Nature Recovery Network map (<https://naturalcapital.gcerdata.com/>) and the Forest of Dean District Council 2012 Core Strategy (<https://www.fdean.gov.uk/planning-and-building/planning-policy/our->

current-local-plan) were used to determine the strategic significance within the BNG Metric 4.0

2.2.5 The quantitative outcomes of the calculations are one component of the BNG Assessment and associated good practice principles. A BNG Assessment also requires the collation of qualitative evidence on the application of the mitigation hierarchy, stakeholder engagement and post-development habitat management. Collectively, these quantitative outcomes and qualitative evidence are used to inform the outcomes of the project-wide BNG Assessment.

2.3 **Limitations and Constraints**

2.3.1 While every attempt has been made to collect accurate baseline data, all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often transient, and it is not possible to confirm the absence of a species through survey. It may be necessary to update the ecological surveys if sufficient time elapses since the surveys and data collection presented in this report were carried out.

Table 1. UKHab Survey Methods

UKHab survey	The aim of the UKHab Survey is to provide a description of the habitats on a particular site and is made in accordance with the UKHab methodology (UKHab, 2020). The survey includes a detailed assessment of the land within the development boundary, including a description and mapping of all key features and habitat types. The survey has been carried out to identify the range of habitats within the Site and the predominant and notable species of flora. Where necessary, the condition of habitat has been described. The appraisal also aims to identify invasive plants listed on Schedule 9 of the WCA 1981 that could have implications for works on the Site. Where appropriate, maps are provided in other formats, such as annotated aerial photographs/site plans.
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3 Results

3.1 UKHab Survey and Habitat Conditions

Table 2. UKHab Survey, BNG Habitat Condition and Recommendations				
Habitat / UKHab	Description	NERC Habitat	BNG Condition and Evaluation	Recommendations
h2a Hedgerow (priority habitat) 75	A single, native, intact species poor hedgerow, approximately 1.4m in height and 1.2m in width was present along the south-western boundary. The hedgerow was actively managed. Species included: hawthorn <i>Crataegus monogyna</i> , bramble <i>Rubus fruticosus</i> agg. and ivy <i>Hedera helix</i> . The hedgerow was assessed as being of moderate condition, failing four attributes out of eight.	Y	Moderate condition. Hedgerow is being retained. No impact expected from construction of the proposed dwelling.	<i>Minimise development footprint to avoid damaging this habitat. Production of ecological management plan to enhance this habitat is advisable.</i>
g4 Modified grassland 66	The area to the north-west of the Site consisted of modified grassland of poor condition, failing three out of seven attributes including essential criterion A. The grassland was actively managed to a very short and uniform sward (<6cm). Species included perennial ryegrass <i>Lolium perenne</i> , cock's-foot <i>Dactylis glomerata</i> , ribwort plantain <i>Plantago lanceolata</i> , red fescue <i>Festuca rubra</i> , daisy <i>Bellis perennis</i> , clover <i>Trifolium</i> sp., dandelion <i>Taraxacum officinale</i> agg., and germander speedwell <i>Veronica chamaedrys</i>	N	Poor condition. Low ecological value. Due to the size of the Site, it is expected that this habitat will be removed to facilitate the development.	<i>The grassland will be reinstated following the construction phase and should be managed to achieve moderate condition. This can be achieved through turfing or seeding of good quality grassland to achieve 6-8 species per m², and relaxing management of the grassland to allow a varied sward height to develop. Production of ecological management plan to enhance this habitat is</i>

Table 2. UKHab Survey, BNG Habitat Condition and Recommendations				
Habitat / UKHab	Description	NERC Habitat	BNG Condition and Evaluation	Recommendations
				<i>advisable.</i>
u1d Suburban / mosaic of developed / natural surface	The majority of the Site comprised a small mosaic of managed habitats (<25m ²) including modified grassland, introduced garden shrubs, paving stones and a small raised ornamental pond (see Target Note on Figure 1.1 for pond location).	N	N/A condition. Vegetated garden.	<i>It is recommended that the use of native species is encouraged and species that are beneficial to pollinators.</i>
u1e Built linear features, 68	A mortared wall bounded the northern, eastern and southern Site boundaries.	N	N/A condition. Wall. This feature is being retained, however a small section will be removed to facilitate the development.	<i>The wall is to be retained.</i>
Scattered trees medium sized	Scattered trees were present in the south-west corner of the Site. Species present included holly <i>Ilex aquifolium</i> , hazel <i>Corylus avellana</i> , dogwood <i>Cornus sanguinea</i> and sweet chestnut <i>Castanea sativa</i> . These trees are blocked together as medium trees (Block 1) and passed four of six criteria to reach a moderate condition.	N	Moderate condition. This feature is being retained within proposed the development.	<i>These trees are to be retained and protected throughout the development.</i>

Table 2. UKHab Survey, BNG Habitat Condition and Recommendations				
Habitat / UKHab	Description	NERC Habitat	BNG Condition and Evaluation	Recommendations
Scattered trees small sized	Scattered trees were present in the eastern area of the Site. Species present included fruit trees (<i>Prunus</i> spp. and <i>Malus</i> spp.), hazel and hawthorn. These trees are blocked together as small trees (Block 2) and passed two of six criteria to reach a poor condition.	N	Poor condition. This feature is largely being retained, however some of the small trees are being removed to facilitate the proposed development.	<i>Replacement tree planting and new tree planting of native species is proposed throughout the development.</i>



Figure 1.1: UKHab map of original habitats at Old Monmouth Road



Figure 1.2: Post intervention habitats map

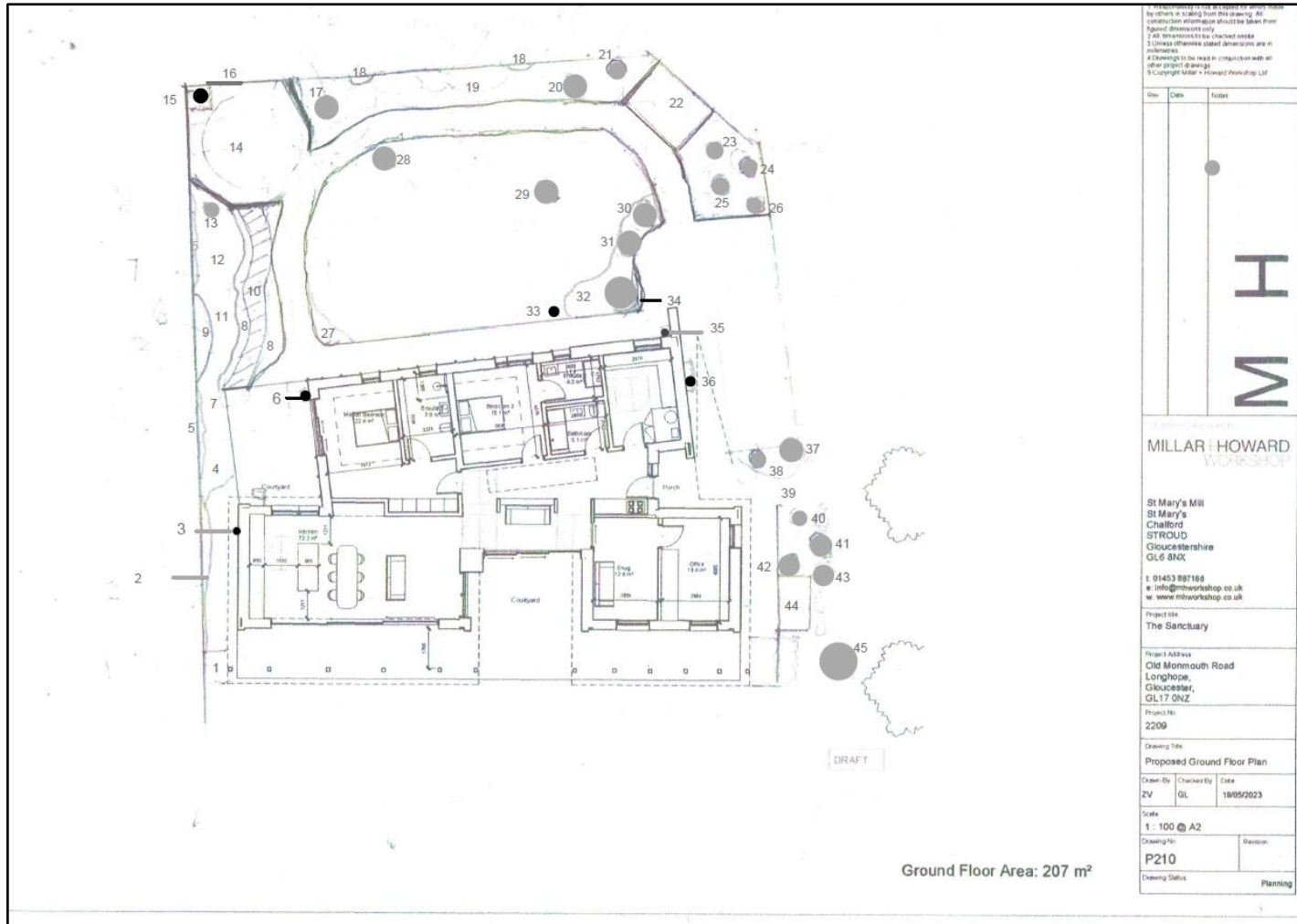


Figure 2: Proposed plans (Millar & Howard Workshop, 2023)

3.2 Biodiversity Net Gain

Summary of Baseline Units

- 3.2.1 Within the Site, area-based habitats currently total 0.19 ha and are generating 0.80 biodiversity units (see Figure 3 and accompanying Defra BNG Metric Excel workbook).
- 3.2.2 A single boundary hedgerow to the west of the Site is currently present, and totals 0.02 km and is generating 0.10 biodiversity units. It is understood that the hedgerow is being retained and no enhancements to this hedgerow are planned.

Summary of Enhanced / Proposed Units

- 3.2.3 On-site post-intervention, retained / enhanced / created area-based habitats will total 0.19 ha and generate a total of 0.90 biodiversity units. This means that an additional 0.09 biodiversity units will be generated, which is a net gain of 11.78% (see Figure 3 and accompanying Defra BNG Metric Excel workbook).
- 3.2.4 No on-site post-intervention hedgerows are proposed and so no additional hedgerow biodiversity units will be generated (see Figure 3 and accompanying Defra BNG Metric Excel workbook).

Figure 3. BNG Headline Results from Defra Biodiversity Metric 4.0 for Old Monmouth Road

Old Monmouth Road		Return to results menu			
Headline Results					
Scroll down for final results ▲					
On-site baseline	Habitat units	0.80			
	Hedge row units	0.10			
	Watercourse units	0.00			
On-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	Habitat units	0.90			
	Hedge row units	0.10			
	Watercourse units	0.00			
On-site net change <small>(units & percentage)</small>	Habitat units	0.09	11.78%		
	Hedge row units	0.00	0.00%		
	Watercourse units	0.00	0.00%		
On-site net gain is less than target set ▲					
Off-site baseline	Habitat units	0.00			
	Hedge row units	0.00			
	Watercourse units	0.00			
Off-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	Habitat units	0.00			
	Hedge row units	0.00			
	Watercourse units	0.00			
Off-site net change <small>(units & percentage)</small>	Habitat units	0.00	0.00%		
	Hedge row units	0.00	0.00%		
	Watercourse units	0.00	0.00%		
Combined net unit change <small>(Including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	0.09			
	Hedge row units	0.00			
	Watercourse units	0.00			
Spatial risk multiplier (SRM) deductions	Habitat units	0.00			
	Hedge row units	0.00			
	Watercourse units	0.00			
FINAL RESULTS					
Total net unit change <small>(Including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	0.09			
	Hedge row units	0.00			
	Watercourse units	0.00			
Total net % change <small>(Including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	11.78%			
	Hedge row units	0.00%			
	Watercourse units	0.00%			
Total net gain achieved is less than target set ▲					
Trading rules satisfied?	Yes ✓				
Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Habitat units	10.00%	0.80	0.88	0.00	Unit requirement met or surpassed ✓
Hedge row units	10.00%	0.10	0.11	0.01	
Watercourse units	10.00%	0.00	0.00	0.00	Unit requirement met or surpassed ✓

4 Discussion

4.1 Habitats

4.1.1 The Site contained predominantly vegetated garden with managed introduced and native shrub species. Also present was a modified grassland area with a number of managed scattered trees and a native managed hedgerow along the western boundary. A small ornamental raised pond was also present within the vegetated garden. More information is provided in the PEA (Wild Service, May 2023) with regards to the importance of habitats and protected species within the Site. The habitats on Site were assessed as being of low ecological value except for the native hedgerow which is being retained. The Site is being developed to include a residential dwelling and garden space.

4.1.2 A number of additional habitat enhancements are proposed for the Site, which cannot be included in the BNG Metric. These include the creation of pondless stream, enhancement of existing native climbers, native border planting and native underplanting (MHP Design Ltd. & Miller Howard Workshop, 2023).

4.2 Biodiversity Net Gain

4.2.1 Assuming that the enhanced and created habitats establish well, it is predicted that the planting proposals outlined in this report will result in a net gain of 0.90 units for habitats, which equates to a BNG of 11.78%. Currently there is no net gain for hedgerows (0.0 units / 0% for hedgerows). However, it is worth noting that there would be no net loss in hedgerow units.

4.2.2 The Site is situated in part of Gloucestershire's Nature Recovery Network (<https://naturalcapital.gcerdata.com/>), where nature recovery opportunities for woodland and open habitats have been highlighted for the Site's location and surrounding area. Trees, ponds and hedgerows are also mentioned as valuable habitats within Policy CSP.2 of the Forest of Dean District Council Core Policies (<https://www.fdean.gov.uk/planning-and-building/planning-policy/our-current-local-plan>). Therefore, the additional native tree planting, as well as the enhancement measures proposed for the grassland to encourage greater native

species richness, will facilitate better linkage between grassland and wooded habitats on Site and sites of nature conservation concern within the local area. This linkage will benefit a variety of wildlife including bats, birds, reptiles and amphibians.

5 References

Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020). UK Habitat Classification – Habitat Definitions V1.1 at <http://ukhab.org>

Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020) The UK Habitat Classification User Manual version 1.1 at <http://ukhab.org>

Gloucestershire Biodiversity Action Plan.

<https://www.gloucestershirenature.org.uk/biodiversity-action-plan-bap>

Miller Howard Workshop. 2023. The Sanctuary, Old Monmouth Road. Proposed Ground Floor Plan. Drawing No. P210

Multi-Agency Geographical Information for the Countryside website <http://magic.defra.gov.uk>. Accessed July 2022.

Natural England & Defra Group (2023), The Biodiversity Metric 4.0 User Guide at <http://publications.naturalengland.org.uk>

Natural England (2023) The Biodiversity Metric 4.0 – Technical Annex 1: Condition Assessment Sheets and Methodology

Wild Service. 2023. Old Monmouth Road, Longhope. Preliminary Ecological Appraisal. Ref. BB2023013Av1.

UK Biodiversity Framework <http://jncc.defra.gov.uk/page-6189>

Appendix 1: Policy and Legal Considerations

Statutory nature conservation sites and protected species are a ‘material consideration’ in the UK planning process (DCLG, March 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK law.

The **Conservation of Habitats and Species Regulations 2017** transpose the requirements of European Directives such as the Habitats Directive and Birds Directive¹ into UK law, enabling the designation of protected sites and species at a European level.

The **Wildlife and Countryside Act 1981** (as amended) forms the key piece of UK legislation relating to the protection of habitats and species. The **Countryside and Rights of Way Act 2000** provides additional support to the 1981 Act, for example, increasing the protection of certain reptile species. Specific protection for badger is provided by the **Protection of Badger Act 1992**. The **Wild Mammals (Protection) Act 1996** sets out the welfare framework with respect to wild mammals prohibiting a range of activities which may cause unnecessary suffering.

The Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of habitats and species of Principal Importance for Conservation in England listed under Section 41 of the **Natural Environment and Rural Communities Bill 2006**². In addition, the 2006 Act places a Biodiversity Duty on public authorities who ‘must, in exercising [their] functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’ (Section 40 (1)). Criteria for selection of priority habitats and species include, for example, international threat (such that species may be protected in their strong holds) and marked national decline.

The **National Planning Policy Framework 2021**³ states that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity, wherever possible. Section 15 states that when determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity 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 planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁴ and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

¹Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, respectively.

²The **NERC Act** refers to “*species of principle importance for the conservation of biodiversity*”, which translates to BAP habitats and species occurring in England.

³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

⁴ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

Appendix 2: Ecological Enhancements

Hedgerow planting

The following is a list of native trees and shrubs

Scientific Name	Common Name
<i>Acer campestre</i>	Field maple
<i>Betula pendula</i>	Silver birch
<i>Carpinus betulus</i>	Hornbeam
<i>Cornus sanguineum</i>	Common dogwood
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogya</i>	Hawthorn
<i>Euonymus europaeus</i>	Spindle
<i>Ilex aquifolium</i>	Holly
<i>Salix caprea</i>	Goat willow
<i>Sorbus aria</i>	Whitebeam
<i>Sorbus aucuparia</i>	Mountain ash (Rowan)
<i>Populus Tremula</i>	Aspen
<i>Prunus avium</i>	Wild cherry
<i>Prunus padus</i>	Bird cherry
<i>Pyrus communis</i>	Wild pear
<i>Viburnum lantana</i>	Wayfaring tree
<i>Viburnum opulus</i>	Guelder rose
Species to replace Ash	
<i>Quercus robur</i>	Pedunculate/English oak
<i>Fagus sylvatica</i>	Beech
<i>Tilia cordata</i>	Small leaved lime
<i>Tilia platyphyllos</i>	Large leaved lime
<i>Ulmus species</i>	Elm (disease resistant)
<i>Populus nigra</i>	Black poplar
<i>Acer campestre</i>	Field maple
<i>Crataegus monogya</i>	Hawthorn
<i>Corylus avellana</i>	Hazel
<i>Ulmus glabra</i>	Wych elm
<i>Sorbus aria</i>	Whitebeam
<i>Acer pseudoplatanus</i>	Sycamore
<i>Carpinus betulus</i>	Hornbeam
<i>Juglans regia</i>	Common walnut
<i>Alnus glutinosa</i>	Alder
<i>Malus domestica</i>	Apple (on M25 rootstock)
<i>Prunus sp.</i>	Plum - particularly Pershore Purple and Blaisdon
<i>Prunus domestica</i> subsp. <i>insititia</i>	Damson
<i>Malus sylvestris</i>	Crab apple
<i>Pyrus communis</i> subsp.	Perry pear

Wildlife Pond planting

The following is a list of plants suitable for planting in new wildlife ponds.

Floating plants and waterlilies (provide perch for insects and frogs)

Scientific Name	Common Name
<i>Hydrocharis morsus-ranae</i>	Frogbit
<i>Stratiotes aloides</i>	Water soldier
<i>Nymphaea alba</i>	White waterlily

Submerged plants (function as oxygenators)

Scientific Name	Common Name
<i>Ceratophyllum demersum</i>	Rigid hornwort
<i>Hippuris vulgaris</i>	Mare's-tail
<i>Potamogeton berchtoldii</i>	Small pondweed
<i>Potamogeton crispus</i>	Curled pondweed
<i>Potamogeton natans</i>	Broad-leaved pondweed
<i>Potamogeton pectinatus</i>	Fennel pondweed

Marginal and surrounding grassland plants

Scientific Name	Common Name
<i>Acorus calamus</i>	Sweet flag
<i>Alisma plantago-aquatica</i>	Water plantain
<i>Butomus umbellatus</i>	Flowering rush
<i>Caltha palustris</i>	Marsh marigold
<i>Cardamine pratensis</i>	Cuckoo flower
<i>Carex paniculata</i>	Greater tussock-sedge
<i>Carex pseudocyperus</i>	Cyperus sedge
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Iris pseudacorus</i>	Yellow flag
<i>Lychnis flos-cuculi</i>	Ragged robin
<i>Lycopus europaeus</i>	Gypsywort
<i>Lysimachia nummularia</i>	Creeping jenny
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Mentha aquatica</i>	Water mint
<i>Menyanthes trifoliata</i>	Bogbean
<i>Myosotis scorpiodes</i>	Water forget-me-not
<i>Ranunculus lingua</i>	Greater spearwort
<i>Sagittaria sagittifolia</i>	Arrowhead
<i>Scrophularia auriculata</i>	Water figwort
<i>Veronica beccabunga</i>	Brooklime
<i>Vicia cracca</i>	Tufted vetch

Grasses

Scientific Name	Common Name
<i>Agrostis stolonifera</i>	Creeping bent
<i>Alepocurus geniculatus</i>	Marsh foxtail
<i>Alepocurus pratensis</i>	Meadow foxtail
<i>Festuca arundinacea.</i>	Tall fescue
<i>Festuca pratensis</i>	Meadow fescue
<i>Glyceria maxima</i>	Reed sweet-grass
<i>Poa annua</i>	Annual meadow-grass

The illustration below shows an ideal profile for a wildlife pond.

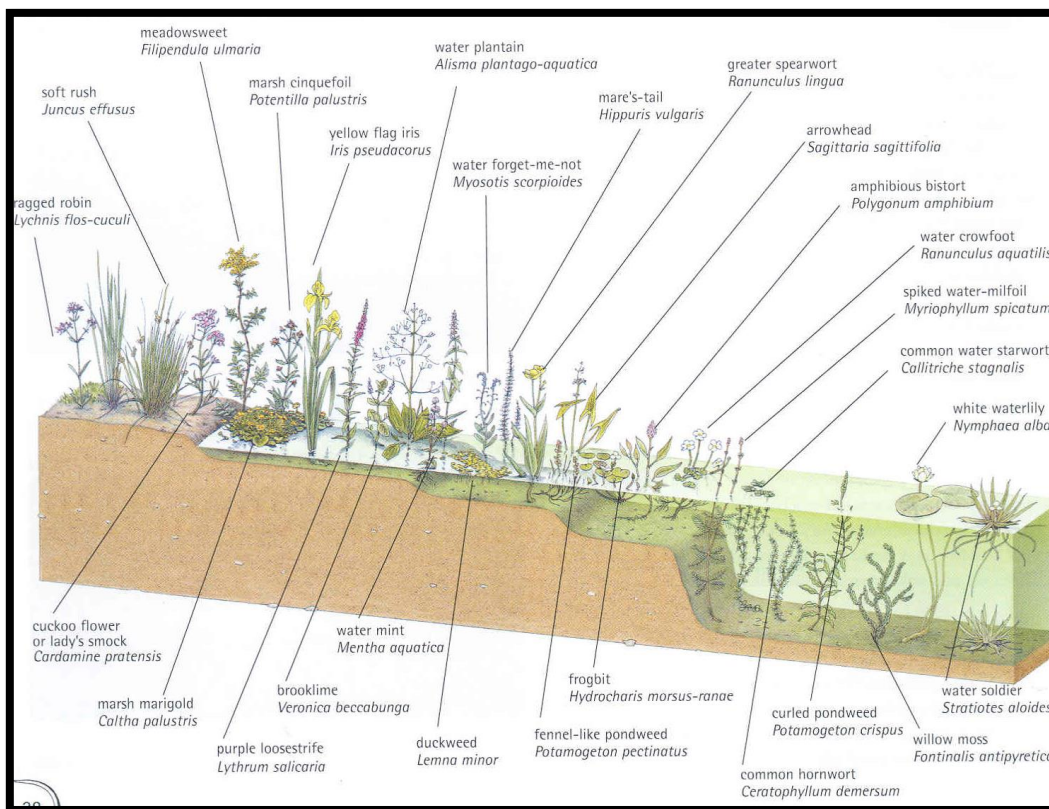


Illustration taken from *The Great Crested Newt Conservation Handbook* © Froglife 2001.



Planting for Wildlife

Many wildlife species benefit greatly from considerate planting choices that still meet our practical and aesthetic needs. Plants and trees provide food for wildlife as well as places to nest and rest. Vegetation providing a variety of these functions creates an environment more beneficial for wildlife.

Non native species

Native species provide the best habitat for UK wildlife but there are also many non-native species, which are single flowering and/or provide fruits/nuts/seeds that can be used as food sources for insects, birds and small mammals. When using these non-native species in planting schemes, care should be taken to avoid invasive species such as Cotoneaster and Rhododendron. This is especially important when sites are adjacent to open countryside particularly nature reserves.



Butterfly bush

Uses of Wildlife Planting

Wildlife value can be easily incorporated into visually pleasing and useful green areas and amenity spaces, such as borders, grass verges and tree screens.

Attractive Borders: Well selected decorative borders can be valuable for many insects and birds. Native plants can be mixed with single flowering ornamental species to add aesthetic interest and increase the flowering period of a planting scheme.

Shrubs and hedges: Native spiky species like blackthorn and hawthorn are effective barriers when used in hedges. They also provide an attractive feature at all times of year especially when in blossom and fruit. Bushy areas of foliage provide useful nesting and feeding areas for birds and small mammals, as well as foraging/commuting corridors for bats.

Grasses mixes and verges: Leaving uncut areas of suitable grasses provides great wildlife value and is economical to manage. Diverse grassy areas and verges also create an attractive human environment with different flowers and colours. There are a range of native grass and flower mixes for various soil types available on the market.



Wild flower grass mix



Selecting Suitable Species

There are wildlife friendly species suitable for all situations, from fields, verges, shady corners or small gardens. Listed below are native wildlife friendly plant species organised by type and suitability for different locations.

Large Trees

Ash *Fraxinus excelsior*
 Beech *Fagus sylvatica*
 English Elm *Ulmus procera*
 Oak *Quercus robur* or *Q. petraea*
 Small-leaved lime *Tilia cordata*
 White willow *Salix alba*
 Wild cherry *Prunus avium*



White willow

Medium/small trees

Alder *Alnus glutinosa*
 Aspen *Populus tremula*
 Crab apple *Malus sylvestris*
 Field maple *Acer campestre*
 Holly *Ilex aquifolium*
 Rowan *Sorbus aucuparia*
 Silver birch *Betula pendula*
 Yew *Taxus baccata*



Tussock grassland

Native shrubs

Blackthorn *Prunus spinosa*
 Dogwood *Cornus sanguinea*
 Elder *Sambucus nigra*
 Guelder rose *Viburnum opulus*
 Hawthorn *Crataegus monogyna*
 Hazel *Corylus avellana*



Blackthorn

Plants for shady areas

Archangel *Lamium galeobdolon*
 Betony *Stachys officinalis*
 Bluebell *Hyacinthoides non-scriptus*
 Bugle *Ajuga reptans*
 Foxglove *Digitalis purpurea*
 Ground ivy *Glechoma hederacea*
 Lily of the valley *Convallaria majalis*
 Lords-and ladies/cuckoopint *Arum maculatum*
 Nettle-leaved bellflower *Campanula trachelium*
 Primrose *Primula vulgaris*
 Sweet violet *Viola odorata*
 Wild daffodil *Narcissus pseudonarcissus*

Plants for marshy areas & pond edges

Bugle *Ajuga reptans*
 Hemp agrimony *Eupatorium cannabinum*
 Marsh marigold *Caltha palustris*
 Marsh woundwort *Stachys palustris*
 Meadowsweet *Filipendula ulmaria*
 Purple loosestrife *Lythrum salicaria*
 Ragged robin *Lychnis flos-cuculi*
 Water avens *Geum rivale*
 Water forget-me-not *Myosotis scorpioides*
 Water mint *Mentha aquatica*
 Water violet *Hottonia palustris*
 Yellow flag *Iris pseudacorus*

**Beneficial cultivated plants
(generally non-natives)**

Grecian windflower *Anemone blanda*
 Angelica *Angelica archangelica*
 Aubretia *Aubretia deltoidea*
 California poppy *Eschscholtzia californica*
 Candytuft *Iberis sempervirens*
 Christmas rose *Helleborus niger*
 Cosmos *Cosmos bipinnatus*
 Evening primrose *Oenothera biennis*
 Fleabane *Erigeron spp.*
 Forget-me-not *Myosotis spp.*
 French marigold *Tagetes patula*
 Globe thistle *Echinops ritro*
 Grape hyacinth *Muscari botryodes*
 Hollyhock *Althaea rosea*
 Honesty *Lunaria rediviva*
 Ice plant *Sedum spectabile*
 Lenten rose *Helleborus orientalis*
 Tree mallow *Lavatera spp.*
 Michaelmas daisy *Aster novae-belgii*
 Mint *Mentha x rotundifolia*
 Perennial cornflower *Centaurea montana*
 Perennial sunflower *Helianthus decapetalus*
 Phlox *Phlox paniculata*
 Poached-egg plant *Limnantes douglasii*
 Red valerian *Centranthus ruber*
 Snapdragon *Antirrhinum majus*
 Spring crocus *Crocus chrysanthus* and hybrids
 Sweet alyssum *Lobularia maritima*
 Sweet bergamot *Monarda didyma*
 Sweet William *Dianthus barbatus*
 Tobacco plant *Nicotiana affinis*
 Wallflower *Cheiranthus cheiri*
 Alpine rock-cress *Arabis alpina*
 Winter aconite *Eranthis hyemalis*
 Yellow alyssum *Alyssum saxatile*

Native wildflowers for borders

Agrimony *Agrimonia eupatoria*
 Betony *Stachys officinalis*
 Bluebell *Hyacinthoides non-scriptus*
 Chicory *Cichorium intybus*
 Chives *Allium schoenoprasum*
 Common poppy *Papaver rhoeas*
 Corncockle *Agrostemma githago*
 Cornflower *Centaurea cyanus*
 Corn marigold *Chrysanthemum segetum*
 Cowslip *Primula veris*
 Cuckooflower *Cardamine pratensis*
 Dame's-violet *Hesperis matronalis*
 Devil's-bit scabious *Succisa pratensis*
 Field scabious *Knautia arvensis*
 Foxglove *Digitalis purpurea*
 Goldenrod *Solidago virgaurea*
 Great mullein *Verbascum thapsus*
 Greater knapweed *Centaurea scabiosa*
 Harebell *Campanula rotundifolia*
 Herb-robert *Geranium robertianum*
 Lady's bedstraw *Galium verum*
 Marjoram *Origanum vulgare*
 Meadow cranesbill *Geranium pratense*
 Common mallow *Malva sylvestris*
 Oxeye daisy *Leucanthemum vulgare*
 Primrose *Primula vulgaris*
 Red campion *Silene dioica*
 Snowdrop *Galanthus nivalis*
 Spiked speedwell *Veronica spicata*
 Tansy *Tanacetum vulgare*
 Teasel *Dipsacus fullonum*
 Toadflax *Linaria vulgaris*
 White campion *Silene alba*
 Wild thyme *Thymus drucei*
 Yellow loosestrife *Lysimachia vulgaris*



Marjoram



Cornflower



Perennial sunflower



Appendix 3: BNG Habitat Condition Assessment Method Tables

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)A1:E17			
UK Habitat Classification (UKHab) Habitat Type(s)			
Grassland - Modified grassland			
Site name and location	The Sanctuary, Old Monmouth Road	On-site or off-site	onsite
Limitations (if applicable)		Survey reference (if relating to a wider survey)	
Grid reference		Habitat parcel reference	
Habitat Description			
ukhab – UK Habitat			
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m ² present, including at least 2 forbs (this may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m ² (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	N	
B	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 vertebrates and invertebrates to live and breed.	N	
C	Some scattered scrub (including bramble <i>Rubus fruticosus</i> agg.) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	
D	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.	Y	
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens) ² .	N	
F	Cover of bracken <i>Pteridium aquilinum</i> is less than 20%.	Y	
G	There is an absence of invasive non-native plant species ³ (as listed on Schedule 9 of WCA ⁴).	Y	
Essential criterion achieved (Yes or No)			No
Number of criteria passed			4
Condition	Condition Assessment Score	Score Achieved	
Passes 6 or 7	Good (3)		
Passes 4 or 5	Moderate (2)		
Passes 3 or fewer	Poor (1)	Poor	
Suggested enhancement interventions to improve condition score			
Footnotes			
<p>Footnote 1 – Creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, curled dock <i>Rumex crispus</i>, broad-leaved dock <i>Rumex obtusifolius</i>, common nettle <i>Urtica dioica</i>, creeping buttercup <i>Ranunculus repens</i>, greater plantain <i>Plantago major</i>, white clover <i>Trifolium repens</i> and cow parsley <i>Anthriscus sylvestris</i>.</p> <p>Footnote 2 – For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover.</p> <p>Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.</p> <p>Footnote 4 – Wildlife and Countryside Act 1981 (as amended).</p>			


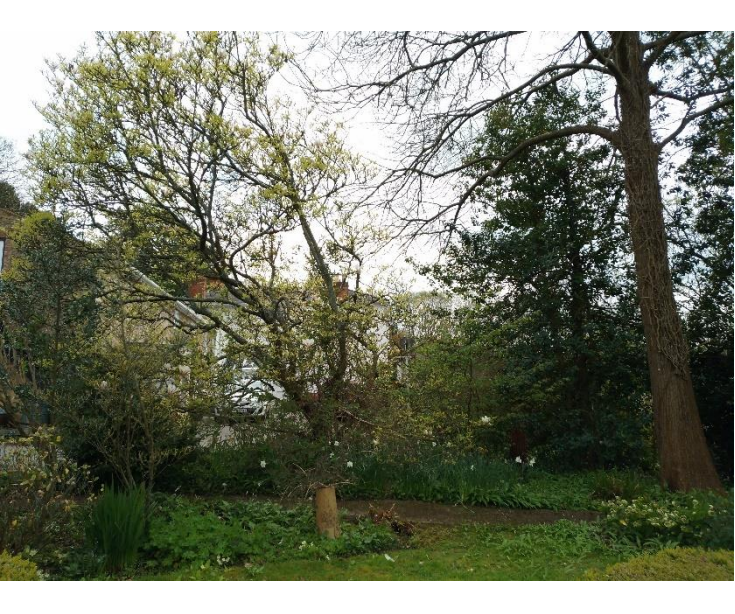
Condition sheet: HEDGEROW Habitat Types				
Habitat Type				
Native hedgerow				
Habitat Description				
See the Biodiversity Metric 4.0 User Guide Section 9.				
Site name and location	The Sanctuary, Old Monmouth Road		On-site or off-site	On-site
Limitations (if applicable)			Survey reference (if relating to a wider survey)	
Grid reference			Habitat parcel reference	
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics are used for this assessment. This assessment is based on the Hedgerow Survey Handbook ¹ and Favourable Conservation Status document ² . For further clarification please refer to the Hedgerow Survey Handbook. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D and E)	Criteria - the minimum requirements for 'favourable condition'	Description	Criterion passed (Yes or No)	Notes (such as 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 the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees.	N
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 (such as blackthorn <i>Prunus spinosa</i> suckers)	N
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	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 hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	N
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles <i>Urtica</i> spp., cleavers <i>Galium aparine</i> and docks <i>Rumex</i> spp. Their presence, either singly or together, does 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 plant species (including those listed on Schedule 9 of WCA ³) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website ⁴ , as well as the BSBI website ⁵ where the 'Online Atlas of the British and Irish Flora' ⁶ contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website ⁷ .	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 hedgerow cutting).	N
The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the metric. The scores for each are set out in the tables below.				
Condition categories for hedgerows without trees				
Category	Category Requirements	Metric Score		
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3		
Moderate	No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and C2 = Moderate condition).	2		
Poor	Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and B2 = Poor condition).	1		
Score achieved: Moderate				
Suggested enhancement interventions to improve condition score				
Footnotes				
Footnote 1 – DEFRA (2007) <i>Hedgerow Survey Handbook. A standard procedure for local surveys in the UK.</i> [online] Available on: layout.hedgelink.org.uk				
Footnote 2 – STALEY, J.T. ET AL. (2020) <i>Definition of Favourable Conservation Status for Hedgerows.</i> [online] Available on: Definition of Favourable Conservation Status for Hedgerows - RP2943 (naturalengland.org.uk)				
Footnote 3 – Wildlife and Countryside Act 1981 (as amended).				
Footnote 4 – CHEFFINGS, C. M. et al. (2006) <i>The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116.</i> [online] Available on: The Vascular Plant Red Data List for Great Britain (Species Status No. 7) JNCC Resource Hub				
Footnote 5 – BOTANICAL SOCIETY OF BRITAIN AND IRELAND (BSBI). <i>Definitions: wild, native or alien?</i> [online] Available on: Definitions: wild, native or alien? – Botanical Society of Britain & Ireland (bsbi.org)				
Footnote 6 – BSBI and Biological Records Centre (BRC) (2022) <i>Online Atlas of the British and Irish Flora.</i> [online] Available on: Acknowledgements Online Atlas of the British and Irish Flora (brc.ac.uk)				
Footnote 7 – GB NON-NATIVE SPECIES SECRETARIAT (GBNNS) (2022) Available on: Home » NNS (nonnativespecies.org)				
Footnote 8 – See gov.uk standing advice on ancient and veteran trees. Available from: Keepers of time: ancient and native woodland and trees policy in England (publishing.service.gov.uk) and Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)				

Condition Sheet: INDIVIDUAL TREES Habitat Type												
Habitat Type(s)												
Individual trees – Urban trees												
Habitat Description												
Individual trees (description applied to the urban or rural environment):												
Site name and location		The Sanctuary, Old Monmouth Road		On-site or off-site		On-site						
Limitations (if applicable)		Survey reference (if applicable)		Habitat parcel reference								
		1		2								
		Grid reference										
Condition Assessment Criteria		Criterion passed (Yes or No)										Notes (such as justification)
A	The tree is a native species (or at least 70% within the block are native species).	Y	Y									
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Y	N									
C	The tree is mature (or more than 50% within the block are mature).	N	N									
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Y	N									
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	N	N									
F	More than 20% of the tree canopy area is overhanging vegetation beneath.	Y	Y									
Number of criteria passed		4	2									
Condition	Condition Assessment Score	Score Achieved x/√										
Passes 5 or 6 criteria	Good (3)											
Passes 3 or 4 criteria	Moderate (2)											
Passes 2 or fewer criteria	Poor (1)											
Note that 'Fairly Good and Fairly Poor' condition categories are not available for this broad habitat type.												
Suggested enhancement interventions to improve condition score												
Footnotes												
Footnote 1 - See gov.uk standing advice on ancient and veteran trees. Available from:												
Keepers of time: ancient and native woodland and trees policy in England (publishing.servi												
and:												
Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.i												

Appendix 4: Photographs

No	Photo	Description
1		View of modified grassland and border planting
2		View of trees within modified grassland

No	Photo	Description
3	 A photograph of an ornamental garden. In the foreground, a narrow, grassy path leads between two rows of neatly trimmed, rectangular hedges. The hedges are a vibrant green color. In the background, there is a large, leafy tree, a white structure that looks like a trellis or pergola, and a building with a chimney. The sky is overcast.	View of ornamental planting and grassland
4	 A photograph of a native boundary hedgerow. The hedgerow is composed of various shrubs and trees, some of which are bare and brown, suggesting it might be late autumn or winter. The hedgerow runs along a grassy area. In the background, there are more trees and a clear sky.	View of native boundary hedgerow

No	Photo	Description
5		View of ornamental pond
6		View of tree block (medium trees)

Appendix 5: Ecological Experience

Becca Brown: Senior Ecologist, BSc (Hons) ACIEEM

Becca has been working in ecological consultancy since 2016 and has been involved in a wide range of surveys including Extended Phase 1 Habitat surveys and a variety of protected species surveys including bats, badger *Meles meles*, barn owl *Tyto alba*, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius*, reptiles, otter *Lutra lutra* and water vole *Arvicola amphibius*. She has experience in writing technical reports, including Preliminary Ecological Appraisals (PEAs), Ecological Impact Assessments (EclAs) and preparation of European Protected Species (EPS) licence applications. She also has experience undertaking Conditioned Assessments and Biodiversity Net Gain (BNG) calculations and is trained and accredited to undertake river condition assessments for BNG. Becca also has experience as an Ecological Clerk of Works (ECoW) for a variety of projects. Becca Holds Natural England Class Licences for bats (level 1), barn owl and great crested newt. She also holds a valid CSCS card, is mental health first aider and is an Associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).

Becca has a degree in Conservation Biology from the University of the West of England, Bristol and went on to complete a Certificate in Ecological Consultancy. Becca has been involved in numerous conservation volunteer opportunities over the years, including undertaking dormouse surveys for the Somerset mammal group, undertaking radio tracking for Bechstein's bats and bat box checks for the Somerset bat group, and undertaking smooth snake surveys with the Amphibian and Reptile Conservation Trust. Becca is currently working towards her Natural England Level 2 bat licence and dormouse licence.

Benjamin Goodger: Principal Ecologist, MA (Oxon) MSc CEnv MCIEEM

Ben has 20 years' experience as a professional ecologist, five in nature conservation and 15 in consultancy. As a consultant he has worked on a wide range of development projects at sites across the UK. These have ranged from housing and employment developments, land reclamation projects, road schemes and major infrastructure projects. He has undertaken numerous site assessments, using information obtained from habitat and protected species surveys and desk-based studies. He is particularly skilled in Ecological Impact Assessments (EclA) and the design of mitigation solutions, and has written ecology chapters for a number of Environmental Statements (ESs). He has also undertaken several Habitat Regulations Assessments (HRAs). Ben is a skilled botanist and has undertaken many plant and habitat surveys in his career, including Phase 1 habitat surveys, National Vegetation Classification (NVC) surveys and targeted plant surveys. Ben holds a Natural England great crested newt and dormouse licence.

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