Technical Note

Project:	Land to the West of Park Farm, Thornbury
Planning reference:	PT18/6450/O & APP/P0119/W/21/3288019
Title:	Biodiversity Net Gain Assessment
Date:	25 February 2022
Client:	Barwood Development Securities and The North-West Thornbury Land Consortium
Reference:	220225_P721_Thornbury_BNG Note: February 2022
Prepared:	D. Scholefield MCIEEM
Approved:	M. Jones CEnv MCIEEM

1   Introduction

1.1   EAD Ecology was commissioned by Barwood Development Securities and The North-West Thornbury Land Consortium to prepare a Biodiversity Net Gain (BNG) Assessment to inform the planning appeal for the above proposed development site (hereafter referenced as 'the proposed Appeal Development' and the 'Appeal Site').

1.2   This Technical Note provides the BNG metric calculations, which demonstrates that the proposed Appeal Development can deliver BNG. The assessment is based on existing baseline value of the Appeal Site (pre-development) and that which could be achieved through the proposed Appeal Development (post-development), as shown on the Green Infrastructure (GI) Parameters Plan and Illustrative Landscape Plan; refer to Figures 1 and 2.

2   Methodology

2.1   The pre and post-development biodiversity value of habitats within the Appeal Site were calculated using the 'Defra Biodiversity Metric 3.0' (Natural England, 2021). 'Value' is measured in 'Biodiversity Units'. Under the Metric, the Units are separated into 'Habitat Units' and linear 'Hedgerow Units'. 'Rivers and Stream Units' are also assessed in the Metric. However, as stream in the southern part of the Appeal Site would not be affected by the proposed Appeal development, this part of the does Metric not require calculation.

2.2   Summary tables are provided in Appendices 1 to 4 and the completed Metric has also been supplied as a digital file (Excel spreadsheet).

Pre-development habitats

2.3   Extended Phase 1 Habitat Surveys of the site were undertaken by EAD Ecology from 2016 to 2018 to inform the Ecological Impact Assessment (Environmental Statement Chapter 12), Barwood 2019). The Phase 1 Habitat Survey followed Institute of Environmental Assessment (IEA) guidelines (1995) and JNCC methodology (2010) to identify the habitat types present.

2.4   An update Extended Phase 1 Habitat Survey of the site and a Habitat Condition Assessment of all habitats was undertaken by EAD Ecology in accordance with Defra Metric 3.0 Criteria (Panks *et al*, 2021 a and b) on 9 February 2022; refer to Figure 3. Pre-intervention habitat areas and lengths have been measured from geo-referenced plans within ArcGIS.

2.5   Whilst February is considered a sub-optimal period for Condition Assessment (Panks *et al* 2021b), the pre-existing survey information, habitats present and a precautionary approach to Condition Criteria assessment ensured that the baseline survey was appropriate to inform the BNG Assessment.

Post-development habitats

2.6   Post-development habitat areas within the Metric are shown on Figure 4. The habitat areas are based on the Green Infrastructure Parameter Plan and Illustrative Landscape Masterplan submitted with the Environmental Statement (refer to Figures 1 and 2 respectively) and measured from geo-referenced plans within ArcGIS.

2.7   The proposed Appeal Development includes 6.8ha of 'Amenity Public Open Space' of underdetermined habitat type; refer to Figure 1. This area is expected to include landscaping, amenity and drainage functions. For the purposes of this BNG assessment, this area has been classified in the Metric as follows:

- 3.4 ha of 'Modified grassland' to reflect likely amenity grassland and playing field provision.
- 3.4 ha of 'Other Neutral Grassland' to reflect expected landscape buffers to retained / proposed hedgerows and trees and provision of other low intensity POS e.g. wildflower meadow.

2.8   Attenuation areas are designed as periodically inundated depressions[1], which will support species-rich wet grassland integrated into the large extent of surrounding informal public open space. The Metric therefore classifies this habitat as 'Other Neutral Grassland'.

2.9   Proposed development parcels have been classified based on the following assumptions:

- An estimated quantum of 60% parcel area as 'Artificial Un-vegetated Sealed Surface'.
- An estimated quantum of 40% parcel area as 'Vegetated garden'[2]
- An estimate of 50 medium and 50 small 'urban' trees delivered within land used for school, retail and transport functions (e.g. streets, footpaths, parking courts).

2.10   Hedgerow calculations allow for creation of site access points where identified on the GI Parameters Plan (H5 and H15). Retained hedgerows will be enhanced where feasible to increase distinctiveness and condition.

2.11   Determination of expected post-development habitat condition is based on the implementation of a Landscape and Ecological Management Strategy (LEMS) in accordance with the mitigation set out in Chapter 12 of the ES. The LEMS would detail the management for all ecological measures in order to meet relevant Metric habitat condition criteria.

2.12   The 'Assessors Comments' within the Site Habitat /Hedgerow Creation and Site Habitat/Hedgerow Enhancement Metric Tables provide further information on the measures proposed to achieve the targeted habitat type and/or condition. All interventions proposed to achieve the conditions specified in the Metric are detailed in Appendix 3. It is considered that all measures are realistic and achievable.

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[1] 1.1m deep with side slopes ranging between 1 in 4 and 1 in 12
[2] This figure is based on professional experience and provides an average quantum of garden space delivered across large residential and mixed-use developments, which include units of varying size and a range of densities.

Strategic Significance / Delivery

2.13   The Strategic Significance of Baseline and Post Construction habitats applied to the Metrics have been assigned in accordance with the Metric guidance (Panks *et al* 2021 a and b), with reference to site-specific information; refer to Table 1. The 'Assessors Comments' within the Metric Tables provide further justification for the 'Strategic Significance' applied to individual habitats.

Table 1: BNG Metric Strategic Significance Criteria

Strategic Significance	Criteria applied in BNG Metric	Relevant Habitats
Within an area formally identified in a local strategy (High).	Specific habitats located within the West of England Nature Recovery Network strategic networks.[3]	Lowland Mixed Deciduous Woodland Other broadleaved woodland
	Specific habitats contributing to landscape-scale conservation projects identified in the South Gloucestershire Biodiversity Action Plan.[4,5]	Other Neutral Grassland (species-rich wildflower meadow)
Location ecologically desirable but not in local strategy (Medium).	Habitats that can contribute to the Favourable Conservation Status (FCS) of local populations of notable or South Gloucestershire BAP Priority Species confirmed as present in the local landscape (i.e. great crested newt) by increasing extent and quality of the local habitat resource and improving landscape connectivity.	All hedgerows (GCN) Ponds (GCN)
Area/compensation not in local strategy/ no local strategy: (Low).	All other habitats.	Tall ruderal, bramble scrub, modified grassland, allotments , vegetated garden, urban trees and un-vegetated sealed surface

2.14   No site or development-specific risks which would affect either the difficulty or time to target condition for the proposed habitat creation and enhancement have been identified. In the absence of an approved phasing strategy[6], it is presumed that there will be no advance habitat creation/-enhancement or delay in delivery of the proposed habitats.

3   Biodiversity Net Gain

3.1   The pre-development biodiversity value of the Appeal Site is 161.01 'Habitat Units' and 42.01 'Hedgerow Units'; refer to Table 2, Figure 3 and Appendices 1 and 2 for baseline summary tables.

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[3] https://wenp.org.uk/#maps

[4] https://www.southglos.gov.uk/documents/Biodiversity-Action-Plan-2016-26.pdf

[5] https://www.buglife.org.uk/our-work/b-lines/b-lines-south-of-england

[6] Environmental Statement paragraph 3.6.1: *A detailed phasing strategy is not confirmed at this stage, but the planning application approval would be subject to a condition requiring the submission of a phasing plan prior to commencement.*

3.2 The post-development biodiversity value of the Appeal site, based on Figures 1 and 2, would be 167.45 'Habitat Units' and 59.37 'Hedgerow Units'. The proposed development can, therefore, demonstrate a Biodiversity Net Gain of +6.45 Habitat Units (4.00%) and +17.36 Hedgerow Units (41.32%); refer to Table 2 and Appendices 1 to 4.

3.3 All 'Habitat Trading' requirements specified in the Metric are satisfied. There is no requirement for delivery of a biodiversity offset to delivery BNG.

Table 2: BNG Metric Summary [7]

On-site baseline pre-development	Habitat units	161.01
	Hedgerow units	42.01
On-site post-development (Habitat retention, creation & enhancement)	Habitat units	167.45
	Hedgerow units	59.37
On-site net % change (Habitat retention, creation & enhancement)	Habitat units	4.00%
	Hedgerow units	41.32%
Total net unit change (Habitat retention, creation & enhancement)	Habitat units	+6.45
	Hedgerow units	+17.36
Trading rules Satisfied?	Yes	

4 Conclusions

4.1 Biodiversity Net Gain calculations (DEFRA 3.0) show that the proposed Appeal Development could deliver a 4.0% net gain in Habitat Units and a 41.32% net gain of Hedgerow Units[8]. As specified in Chapter 12 of the ES, the proposed LEMS would set out the proposed management strategy, responsibilities for management actions and the framework for monitoring to provide certainty for the achievement and long term maintenance of the predicted net gains. The LEMS could be secured by Planning Condition; an updated Metric based on the detailed landscape proposals produced at that time could also form part of the LEMS output.

4.2 Should the 'Safeguarded Land' in the north-eastern corner of the Appeal Site be brought forward for drainage purposes by the Council, there would be no significant change to the Biodiversity Net Gain conclusion set out above. The proposed wildlife pond for this area could still be delivered and could be moved outside of the Safeguarded Land within immediately adjacent Public Open Space; refer to Figure 4. Furthermore, the future composition of the Safeguarded Land would be likely to comprise similar grassland types to those currently assessed for this area in this Biodiversity Net Gain Assessment, potentially with the addition of a SUDS feature such as a detention pond. The latter would have a negligible effect on the Biodiversity Net Gain calculations overall; the Habitat Units generated by such drainage features are very similar to those identified for the current grassland types. There would be no change to the Hedgerow Unit assessment or conclusion.

4.3 Further ecological enhancement measures specified in Chapter 12 of the ES but not captured by the Metric include the following:

- A minimum of 10 reptile hibernacula and log piles created in suitable locations (grassland margins and woodland edges) to benefit local reptile and amphibian populations, including Priority and South Gloucestershire BAP Species.

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[7] Headline figures reflect metric outputs which include built in rounding to two decimal places.
[8] Area and Hedgerow biodiversity units are unique and cannot be summed, traded or converted. When reporting biodiversity gains or losses with the metric, the different biodiversity unit types must be reported separately and not summed to give an overall biodiversity unit value (Panks 2021a).

- A minimum of 100 bat roost boxes incorporated into new buildings and 50 boxes on retained trees/woodland.
- A minimum of 100 bird boxes incorporated into on buildings and 50 boxes on retained trees/woodland.

4.4   As set out in the ES, the proposed Appeal Development would accord with the National Planning Policy Framework (2021), Policy PSP19 of the South Gloucestershire Policies, Sites and Places Plan, and Policy CS2 of the South Gloucestershire Core Strategy (2006-2027)[9]. This view is confirmed in the Officers Report to Planning Committee[10] and accordingly the Statement of Common Ground prepared and agreed for the Appeal.

References

Barwood Development Securities Ltd and The North West Thornbury Landowners Consortium (2019) Environmental Statement. Land to the West of Park Farm, Thornbury, South Gloucestershire. December 2019

Barwood Development Securities Ltd and the North West Thornbury Landowner Consortium and South Gloucestershire Council (2022) Land West of Park Farm, Thornbury. Statement of Common Ground Local Planning Authority Reference Number – PT18/6450/O PINS Reference: APP/P0119/W/21/3288019 February 2022 (Version FINAL SIGNED)

Institute of Environmental Assessment, (1995). Guidelines for baseline ecological assessment. Chapman and Hall (Spon).

JNCC (2010). Handbook for Phase-1 Habitat Survey: a technique for environmental audit. JNCC, Peterborough.

Natural England (2021) Natural England Joint Publication JP029. The Biodiversity Metric 3. Auditing and accounting for biodiversity.

Panks S., N White, A Newsome, J Potter, M Heydon, E Mayhew, M Alvarez, T Russell, S Scott, M Heaver, SH. Scott, J Treweek, B Butcher, D Stone (2021a) JP039. Biodiversity Metric 3.0. Auditing and accounting for biodiversity: User Guide. Natural England

Panks S., N White, A Newsome, J Potter M Heydon , E Mayhew, M Alvarez, T Russell, S Scott , M Heaver , SH. Scott , J Treweek , B Butcher, D Stone (2021b) JP039 Biodiversity Metric 3.0 Auditing and accounting for biodiversity Technical Supplement. Natural England

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[9] Mandatory 10% delivery BNG as set out in the Environment Act is likely to become to become law in late 2023. It is expected that Reserved Matters will not be required to fulfil 10% BNG if the outline was approved prior to mandatory BNG; it will only apply to new applications submitted once BNG is mandated. https://www.local.gov.uk/pas/topics/environment/biodiversity-net-gain/biodiversity-net-gain-faqs-frequently-asked-questions

[10] *The proposed development would not result in the loss or deterioration of irreplaceable habitats. Whilst the proposal would impact upon species identified within the South Gloucestershire BAP, the applicant has put forward a number of mitigation measures to overcome the impact. On this basis it is considered that any less harmful impacts would be mitigated against and that the proposal aligns with Policy PSP 19 Wider Biodiversity and the principles within section 15 of the NPPF.*
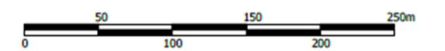
Figure 1: Green Infrastructure Parameters Plan

Scale for planning purposes only

Revision		Date	Drn	Ckd
L	Additional Translocated Hedge	19.12.19	AT	AT

PARAMETERS

Site Boundary

Amenity Public Open Space
(including, as required: access, play facilities, drainage, landscaping, amenity grassland, retained vegetation, pedestrian/cycle links, and all necessary infrastructure)

Flexible Land Use Boundary
(Land use boundary deviation is permitted by a limit of 5m)

Existing Trees and hedgerows to be retained

Veteran Tree to be retained

Existing Trees and hedgerows to be removed as required

Zone where hedgerow removal is permitted to enable acccess

Woodland Structure Planting

Zone for New Allotments

Existing retained Water Course

Existing footpath (PROW) to be retained

Proposed wildlife pond

Translocated hedgerow or new hedgerow

Zone for parkland with meadow grassland and dispersed tree planting

Zone for SUDS Basins with wet grassland

Indicative Alignment of Primary Street
(Exact alignment to be determined at reserved matters stage)

Indicative Alignment of Pedestrian, Cycle and Bus Access
(Sustainable Travel link - exact alignment to be determined at reserved matters stage)

PARK FARM DEVELOPMENT

Park Farm Boundary

Indicative Development Area
(Under Construction)

Main Street Alignment

Project
**Pickedmoor
Thornbury**

Drawing Title
**Parameter Plan
Green Infrastructure**

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Project No	Drawing No	Revision
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Figure 2: Illustrative Landscape Masterplan
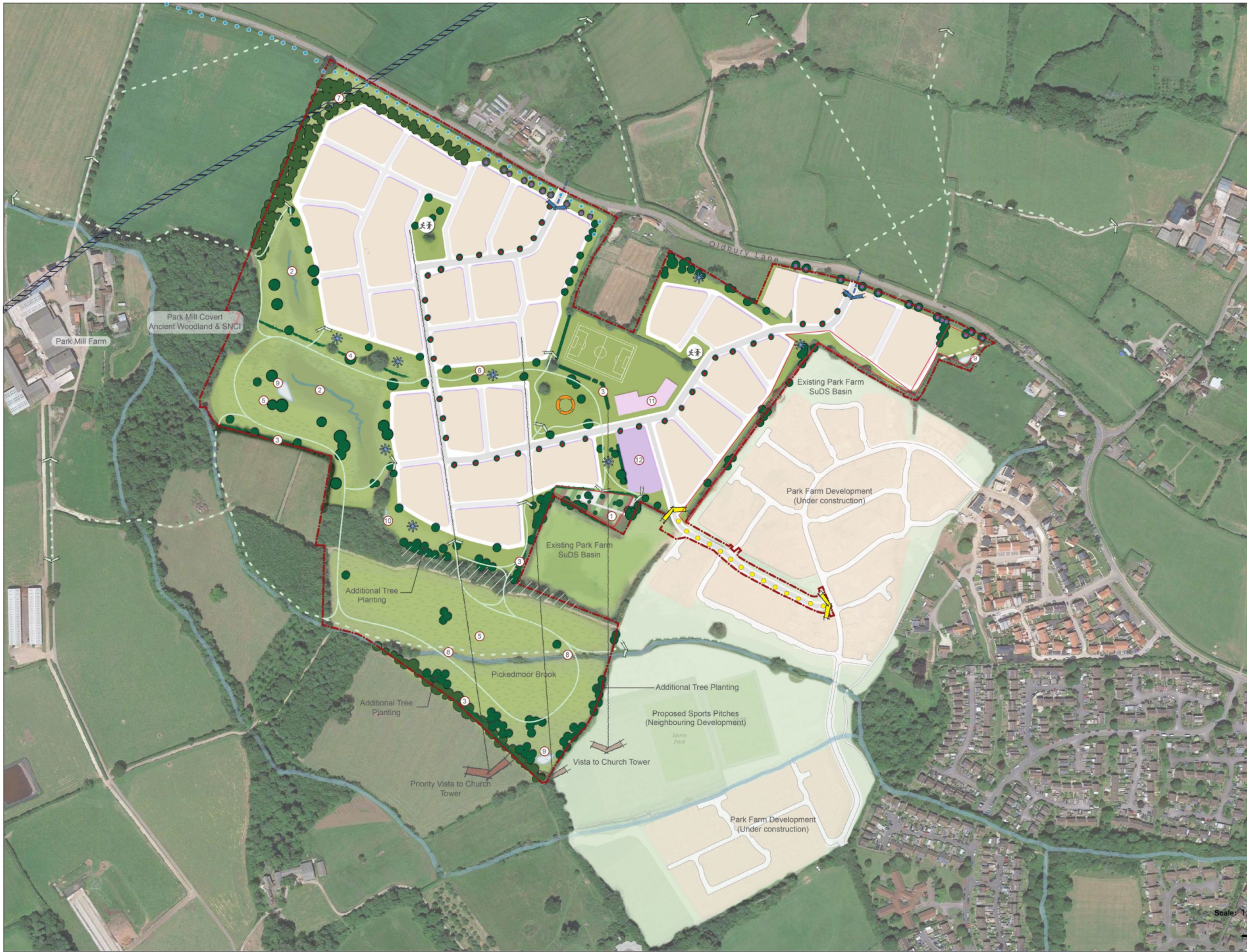
Legend

- Site
- Proposed pedestrian linkages
- Proposed vehicle entrances
- Proposed sustainable transport connection to Park Farm
- Existing trees and hedgerows (priority habitat)
- Existing water course (priority habitat)
- Existing standing water / pond (priority habitat)
- Proposed informal meadow grassland
- Proposed wet grassland (SuDS depression)
- Proposed Wessex Water Foul Drainage

Proposed Tree/Hedgerow Planting:

- Native woodland structure planting (mixed species sizes)
- Parkland /open space planting (mixed species sizes)
- Translocated hedgerow
- Street trees (large species)
- Trees along road frontage (large species)
- Destination Park
- Neighbourhood Greens
- Natural Play
- Existing belt of trees to be managed to thicken up with interplanting of holly understorey and climatic climax ANS tree species. Where vistas are proposed the lower canopy of the taller trees would be thinned/cleared so as to provide sightline 'windows' through the tree belt towards the church tower.

1. Proposed allotments
2. Proposed SuDS surface water attenuation areas: (it is envisaged that these would be dry depressions that would periodically fill with water for short periods of time during storm events)
3. Proposed translocated hedgerow
4. Location of existing hedgerow linking to woodland
5. Proposed parkland/informal POS
6. Proposed green corridor
7. Easement for existing oil pipeline
8. Existing watercourse & proposed crossing points
9. Proposed indicative wildlife pond location
10. Existing pond (priority habitat)
11. School (1FE)
12. Indicative location of Retail/Community Hub

NOTE: This drawing should be read in conjunction with the Green Infrastructure Context Plan 16-10-PL-202 which shows the green infrastructure assets and links surrounding the site.

Labels on plan:
- Park Mill Covert Ancient Woodland & SNCI
- Park Mill Farm
- Oldbury Lane
- Additional Tree Planting
- Existing Park Farm SuDS Basin
- Pickedmoor Brook
- Additional Tree Planting
- Proposed Sports Pitches (Neighbouring Development)
- Additional Tree Planting
- Vista to Church Tower
- Priority Vista to Church Tower
- Existing Park Farm SuDS Basin
- Park Farm Development (Under construction)
- Park Farm Development (Under construction)

Figure 3: Pre-development (Baseline) Metric Habitat Condition Assessment Plan

Key

- Modified grassland (Moderate condition)
- Modified grassland (Good condition)
- Bramble scrub (Poor condition)
- Native Hedgerow (Good condition)
- Native Hedgerow (Moderate condition)
- Native Hedgerow (Poor condition)
- Native Hedgerow- Associated with bank or ditch (Poor condition)
- Native Hedgerow- Associated with bank or ditch (Good condition)
- Native Hedgerow with trees- Associated with bank or ditch (Good condition)
- Native Species-rich Hedgerow- Associated with bank or ditch (Good quality)
- Native Species-rich Hedgerow- Associated with bank or ditch (Poor condition)
- Native Species-rich Hedgerow (Good condition)
- Native Species-rich Hedgerow with trees (Poor condition)
- Lakes- Ponds (Non-Priority Habitat) (Poor condition)
- Sparsely vegetated land- Ruderal/Ephemeral (Poor condition)
- Woodland and forest- Lowland mixed deciduous woodland (Moderate condition)
- Woodland and forest- Lowland mixed deciduous woodland (Poor condition)
- Site boundary

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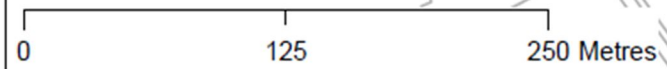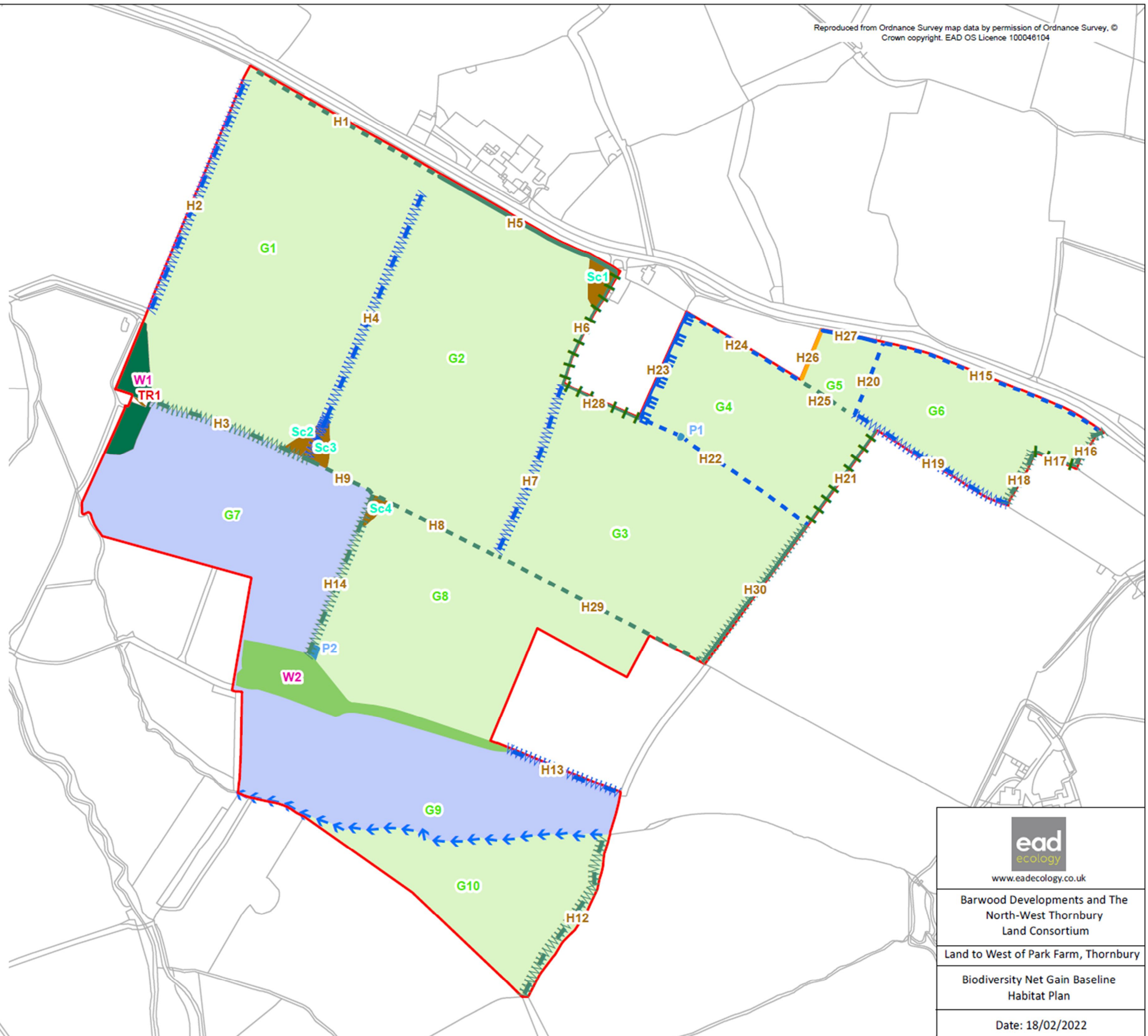
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Barwood Developments and The North-West Thornbury Land Consortium

Land to West of Park Farm, Thornbury

Biodiversity Net Gain Baseline Habitat Plan

Date: 18/02/2022

0   125   250 Metres

Figure 4: Post-development Metric Habitat Retention, Creation and Enhancement Plan

Key

- →→→ Running water
- ■ New pond - non-priority habitat (Good Condition)
- ■ Enhanced pond - non-priority habitat (Good Condition)
- ━━ Retained native species-rich hedgerow enhanced to provide species-rich hedgerow with trees, including bank or ditch where present (Good Conditon)
- ━━ New native species-rich hedgerow with trees (Good Condition)
- ━━ Site boundary
- ▧ Allotments (Moderate Condition)
- ▨ Other neutral grassland - wet grassland (Good Condition)
- ▨ Other neutral grassland - wildflower meadow (Good Condition)
- ■ Other Woodland; broadleaved (Good Condition)
- ■ Public open space - modified grassland (Moderate Condition) / other neutral grassland (Good Condition)
- ■ Lowland mixed deciduous woodland (Good Condition)
- ▨ Lowland mixed deciduous woodland (Moderate Condition)
- □ Artificial unvegetated unsealed surface / vegetated garden and urban trees (Poor Condition)

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0   125   250 Metres

Appendix 1: Biodiversity Net Gain Metric Summary Tables

Table A1.1. Baseline Habitat Metric Summary Table

Habitat type	Area (ha)	Distinctiveness	Condition	Strategic significance	Total habitat units	Area enhanced (ha)	Baseline units enhanced	Area lost (ha)	Units lost	Assessor comments
Modified grassland	5.89	Low	Moderate	Low	23.56	0	0	5.89	23.56	Unit G1: Fails Conditions 1, 2, 7
Modified grassland	5.82	Low	Moderate	Low	23.28	0	0	5.82	23.28	Unit G2: Fails Conditions 1, 7
Modified grassland	4.49	Low	Moderate	Low	17.96	0	0	4.49	17.96	Unit G3: Fails Conditions 1, 2, 7
Modified grassland	2.25	Low	Moderate	Low	9	0	0	2.25	9	Unit G4: Fails Conditions 1, 2, 7
Modified grassland	0.34	Low	Moderate	Low	1.36	0	0	0.34	1.36	Unit G5: Fails Conditions 1, 4
Modified grassland	1.94	Low	Moderate	Low	7.76	0	0	1.94	7.76	Unit G6: Fails Conditions 1, 7
Modified grassland	3.43	Low	Good	Low	20.58	0	0	3.43	20.58	Unit G7: Fails Condition 1
Modified grassland	3.85	Low	Moderate	Low	15.4	0	0	3.85	15.4	Unit G8: Fails Conditions 1, 7
Modified grassland	3.15	Low	Good	Low	18.9	0	0	3.15	18.9	Unit G9: Fails Condition 1
Modified grassland	2.23	Low	Moderate	Low	8.92	0	0	2.23	8.92	Unit G10: Fails Conditions 1, 2, 7
Lowland mixed deciduous woodland	0.41	High	Poor	High	2.829	0.41	2.829	0	0	Unit W1: Lies within Nature Recovery Network; Woodland Strategic Network (refer to Technical Note). Condition Score: 23 (small woodland unit lacking older tree class, species diversity, distinct canopy tiers and standing dead wood)
Lowland mixed deciduous woodland	0.75	High	Moderate	High	10.35	0.75	10.35	0	0	Unit W2: Lies with Nature Recovery Network; Woodland Strategic Network (refer to Technical Note). Condition Score 29 (small woodland block lacking distinct canopy tiers and multiple stages of regrowth)
Ponds (Non-Priority Habitat)	0.02	Medium	Poor	Medium	0.088	0.01	0.044	0.01	0.044	Two small ponds - dry since 2016: both fail condition criteria 1,2, 8, and 9. Criteria relating to water levels n/a. Potential to provide habitat for local GCN (South Gloucestershire BAP species) Meta Population confirmed to east and west of site.
Bramble scrub	0.09	Medium	Poor	Low	0.36	0	0	0.09	0.36	Small bramble scrub patch in field corner; single age class. Condition pre-set to poor.
Bramble scrub	0.06	Medium	Poor	Low	0.24	0	0	0.06	0.24	Small bramble scrub patch in field corner; single age class. Condition pre-set to poor.
Bramble scrub	0.06	Medium	Poor	Low	0.24	0	0	0.06	0.24	Small bramble scrub patch in field corner; single age class. Condition pre-set to poor.
Bramble scrub	0.04	Medium	Poor	Low	0.16	0	0	0.04	0.16	Small bramble scrub patch in field corner; single age class. Condition pre-set to poor.
Ruderal/ Ephemeral	0.01	Low	Poor	Low	0.02	0	0	0.01	0.02	Small patch in field corner ; Fails criteria 1, 3 and 4)
Total	34.83				161.01	1.17	13.22	33.66	147.78	

Table A1.2. Baseline Hedgerow Metric Summary Table

Hedge Ref	Hedgerow type	Length (km)	Distinctiveness	Condition	Strategic significance	Total hedgerow units	Length retained (km)	Length Enhanced (km)	Units retained	Units enhanced	Length lost (km)	Units lost	Assessor comments
H1	Native Hedgerow - Associated with bank or ditch	0.205	Medium	Good	Medium	2.829	0	0.205	0	2.829	0	0	Refer to Technical Note Table A2.5. Fails Condition C2 only, Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H2	Native Species Rich Hedgerow - Associated with bank or ditch	0.241	High	Poor	Medium	1.5906	0	0.241	0	1.5906	0	0	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H3	Native Species Rich Hedgerow - Associated with bank or ditch	0.158	High	Good	Medium	3.1284	0	0.158	0	3.1284	0	0	Refer to Technical Note Table A2.5. Fails Condition C2 only, Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H4	Native Species Rich Hedgerow - Associated with bank or ditch	0.28	High	Poor	Medium	1.848	0	0	0	0	0.28	1.848	Refer to Technical Note Table A2.5. Fails Condition B2, C1 & C2. Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H5	Native Hedgerow	0.197	Low	Good	Medium	1.3002	0	0.15	0	0.99	0.047	0.3102	Refer to Technical Note Table A2.5. Fails Condition C2 only. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population. Assumed hedge removal for access.
H6	Native Species Rich Hedgerow with trees	0.124	High	Good	Medium	2.4552	0	0.124	0	2.4552	0	0	Refer to Technical Note Table A2.5. Fails Condition C2 only, Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population. n.
H7	Native Species Rich Hedgerow - Associated with bank or ditch	0.175	High	Poor	Medium	1.155	0	0.05	0	0.33	0.125	0.825	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H8	Native Hedgerow - Associated with bank or ditch	0.134	Medium	Good	Medium	1.7688	0	0	0	0	0.134	1.7688	Refer to Technical Note Table A2.5. Fails Condition B2 & C2; Bank Present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H9	Native Hedgerow - Associated with bank or ditch	0.069	Medium	Good	Medium	0.9108	0	0.02	0	0.264	0.049	0.6468	Refer to Technical Note Table A2.5. Fails Condition B2 & C2; Ditch Present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H12	Native Species Rich Hedgerow - Associated with bank or ditch	0.178	High	Good	Medium	3.5244	0	0.178	0	3.5244	0	0	Refer to Technical Note Table A2.5. Fails Condition C2 only, Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H13	Native Species Rich Hedgerow - Associated with bank or ditch	0.114	High	Poor	Medium	0.7524	0	0.114	0	0.7524	0	0	Refer to Technical Note Table A2.5. Fails Condition B2, C1 & C2.; Ditch and bank present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H14	Native Species Rich Hedgerow - Associated with bank or ditch	0.166	High	Good	Medium	3.2868	0	0	0	0	0.166	3.2868	Refer to Technical Note Table A2.5. Ditch present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H15	Native Hedgerow - Associated with bank or ditch	0.225	Medium	Poor	Medium	0.99	0	0.15	0	0.66	0.075	0.33	Refer to Technical Note Table A2.5. Fails Condition A1, A2, B2, C1, C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population. Assumed hedge removal for access.
H16	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.045	V.High	Good	Medium	1.188	0.045	0	1.188	0	0	0	Refer to Technical Note Table A2.5. Fails Condition B2 & C2; Ditch Present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H17	Native Hedgerow with trees - Associated with bank or ditch	0.044	High	Good	Medium	0.8712	0	0	0	0	0.044	0.8712	Refer to Technical Note Table A2.5. Fails Condition C2; Ditch present. . All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H18	Native Species Rich Hedgerow - Associated with bank or ditch	0.056	High	Good	Medium	1.1088	0	0.056	0	1.1088	0	0	Refer to Technical Note Table A2.5. Fails Condition C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.

Table A1.2. Baseline Hedgerow Metric Summary Table

Hedge Ref	Hedgerow type	Length (km)	Distinctiveness	Condition	Strategic significance	Total hedgerow units	Length retained (km)	Length Enhanced (km)	Units retained	Units enhanced	Length lost (km)	Units lost	Assessor comments
H19	Native Species Rich Hedgerow - Associated with bank or ditch	0.171	High	Poor	Medium	1.1286	0	0.171	0	1.1286	0	0	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H20	Native Hedgerow - Associated with bank or ditch	0.081	Medium	Poor	Medium	0.3564	0	0	0	0	0.081	0.3564	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H21	Native Hedgerow with trees - Associated with bank or ditch	0.11	High	Good	Medium	2.178	0	0.11	0	2.178	0	0	Refer to Technical Note Table A2.5. Fails Condition C2; Ditch present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H22	Native Hedgerow - Associated with bank or ditch	0.167	Medium	Poor	Medium	0.7348	0	0.05	0	0.22	0.117	0.5148	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H23	Native Species Rich Hedgerow with trees	0.112	High	Poor	Medium	0.7392	0	0.112	0	0.7392	0	0	Refer to Technical Note Table A2.5. Fails Condition B1, C1, C2 & D2. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H24	Native Hedgerow - Associated with bank or ditch	0.125	Medium	Poor	Medium	0.55	0	0.125	0	0.55	0	0	Refer to Technical Note Table A2.5. Fails Condition C1 & C2; Ditch present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H25	Native Hedgerow - Associated with bank or ditch	0.053	Medium	Good	Medium	0.6996	0	0.025	0	0.33	0.028	0.3696	Refer to Technical Note Table A2.5. Fails Condition C2; Ditch and bank present. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H26	Native Hedgerow	0.05	Low	Moderate	Medium	0.22	0	0.05	0	0.22	0	0	Refer to Technical Note Table A2.5. Fails Conditions A2, B2, C1. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H27	Native Hedgerow	0.052	Low	Poor	Medium	0.1144	0	0.052	0	0.1144	0	0	Refer to Technical Note Table A2.5. Fails Condition B2, C1, C2 & D2. All hedgerows represents terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H28	Native Hedgerow with trees - Associated with bank or ditch	0.082	High	Good	Medium	1.6236	0	0.082	0	1.6236	0	0	Refer to Technical Note Table A2.5. Fails Condition C2; Ditch present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H29	Native Hedgerow - Associated with bank or ditch	0.219	Medium	Good	Medium	2.8908	0	0.01	0	0.132	0.209	2.7588	Refer to Technical Note Table A2.5. Fails Condition B2 & C2; bank present. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
H30	Native Species Rich Hedgerow	0.166	Medium	Good	Medium	2.1912	0	0.166	0	2.1912	0	0	Refer to Technical Note Table A2.5. Fails Condition B2 & C2. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
Totals		3.799				42.1342	0.045	2.399	1.188	27.0598	1.355	13.8864	

Table A1.3. Habitat Creation Metric Summary Table

Habitat	Area (ha)	Distinctiveness	Condition	Strategic significance	Time to target condition	Standard difficulty of creation	Applied difficulty multiplier	Habitat units delivered	Assessor comments
Other neutral grassland	8.54	Medium	Good	High	Standard	Low	Standard	82.52967	Habitat comprises Wildflower meadow managed in accordance with LEMS to maintain species richness, varied sward height and to restrict scrub cover, bare ground and non-native species (refer to Technical Note appendix 3). Habitat will contribute wildflower-rich areas to South the Gloucestershire BAP landscape-scale conservation project; West of England B-Line (refer to Technical Note Table 1).
Other neutral grassland	1.5	Medium	Good	High	Standard	Low	Standard	14.49584	Habitat comprises wet grassland managed in accordance with LEMS to maintain species richness, varied sward height and to restrict scrub cover, bare ground and non-native species. Habitat lies within Nature Recovery Network Indicative Wetland Opportunities Zone (refer to Technical Note Table 1).
Other woodland; broadleaved	0.95	Medium	Good	High	Standard	Low	Standard	4.192535	Managed in accordance with LEMS to provide native mixed species woodland and develop range of age classes and canopy tiers (refer to Technical appendix Table A3.2). Lies within Nature Recovery Network; Woodland Strategic Network (refer to Technical Note).
Ponds (Non-Priority Habitat)	0.03	Medium	Good	Medium	Standard	Low	Standard	0.331384	Managed in accordance with LEMS to provide permanent open water with aquatic vegetation and limited shading and absence of non-native species and fish populations. Habitat represents potential aquatic / breeding habitat for local GCN (South Gloucestershire BAP Species) Meta Population confirmed to east and west of site.
Allotments	0.3	Low	Moderate	Low	Standard	Low	Standard	1.158	Design / management will provide range of nectar sources and prevent establishment of non-native invasive species in accordance with Condition criteria.
Vegetated garden	6	Low	Poor	Low	Standard	Low	Standard	11.58	Private Gardens; no ongoing management. Estimate of 40% coverage of development area (refer to Technical note)
Modified grassland	3.4	Low	Moderate	Low	Standard	Low	Standard	11.79365	Amenity grassland /playing fields in POS managed in accordance with LEMS (assumed failure of Condition Criteria 1, and 2; refer to Technical Note Table A3.1)
Other neutral grassland	3.4	Medium	Moderate	High	Standard	Low	Standard	26.176	Habitat comprises Wildflower meadow managed in accordance with LEMS to maintain species richness, varied sward height and to restrict scrub cover, bare ground and non-native species (refer to Technical Note appendix 3). Habitat will contribute wildflower-rich areas to South the Gloucestershire BAP landscape-scale conservation project; West of England B-Line (refer to Technical Note Table 1).
Urban Tree	0.2261	Medium	Poor	Low	Standard	Low	Standard	0.633335	Estimate of 50 small and 50 medium street trees
Artificial un-vegetated, unsealed surface	9.021	V.Low	N/A - Other	Low	Standard	Low	Standard	0	Development Area (houses, infrastructure etc.)
Total	33.3671							152.8904	

Table A1.4. Habitat Enhancement Metric Summary Table

Habitat	Baseline					Post Development					Temporal risk multiplier			Difficulty risk multipliers		Habitat units delivered	Assessor comments
	Total habitat area (ha)	Distinctiveness	Condition	strategic significance	habitat units	Proposed habitat	Distinctiveness change	Condition change	Area (ha)	Strategic significance	Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Standard or adjusted time to target condition	Standard difficulty of enhancement	Applied difficulty multiplier		
Lowland mixed deciduous woodland	0.41	High	Poor	High	2.829	Lowland mixed deciduous woodland	High - High	Poor - Moderate	0.41	High	0	0	Standard	High	Standard	3.286818	Unit W1: Lies with Nature Recovery Network; Woodland Strategic Network (refer to Technical Note) Planting to enhance diversity of canopy and ground flora, create standing deadwood. Managed in accordance with LEMS; refer to Technical Note Table A3.2
Lowland mixed deciduous woodland	0.75	High	Moderate	High	10.35	Lowland mixed deciduous woodland	High - High	Moderate - Good	0.75	High	0	0	Standard	High	Standard	11.18747	Unit W2: Lies with Nature Recovery Network; Woodland Strategic Network (refer to Technical Note). Planting to enhance diversity and structure of canopy and ground flora, create standing deadwood. Managed in accordance with LEMS; refer to Technical Note Table A3.2
Ponds (Non-Priority Habitat)	0.02	Medium	Poor	Medium	0.088	Ponds (Non-Priority Habitat)	Medium - Medium	Poor - Good	0.01	Medium	0	0	Standard	Medium	Standard	0.088338	Enhancement to retained pond (P2) to provide permanent open water with aquatic vegetation and limited shading and absence of non-native species and fish populations. Managed in accordance with LEMS; refer to Technical Note table A3.3. Habitat represents potential aquatic / breeding habitat for local GCN (South Gloucestershire BAP Species) Meta Population confirmed to east and west of site.
TOTAL	1.18															14.56263	

Table A1.5. Hedgerow Creation Metric Summary Table

Ref	Proposed habitats					Temporal multiplier			Difficulty risk multipliers			Hedge units delivered	Assessor comments
	Habitat type	Length (km)	Distinctiveness	Condition	Strategic significance	Habitat created in advance/years	Delay in starting habitat creation/years	Time to target condition	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation		
1	Native Species Rich Hedgerow with trees	0.203	High	Good	Medium	0	0	Standard	Low	Standard	Low	1.97	Translocated hedge section buffered by POS and managed in accordance with LEMS to establish appropriate height / width, standard tree presence and species diversity; refer to Technical Appendix Tables A3.4 and A3.5. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
2	Native Species Rich Hedgerow with trees	0.235	High	Good	Medium	0	0	Standard	Low	Standard	Low	2.28	Translocated hedge section buffered by POS and managed in accordance with LEMS to establish appropriate height / width, standard tree presence and species diversity; refer to Technical Appendix Tables A3.4 and A3.5. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
3	Native Species Rich Hedgerow with trees	0.39	High	Good	Medium	0	0	Standard	Low	Standard	Low	3.79	Translocated hedge section buffered by POS and managed in accordance with LEMS to establish appropriate height / width, standard tree presence and species diversity; refer to Technical Appendix Tables A3.4 and A3.5. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
Total		0.83										8.04	

Table A1.5. Hedgerow Enhancement Metric Summary Table

Metric Ref	Habitat	Length (km)	Condition	Strategic significance c	Proposed habitat	Distinctiveness movement	Condition	Strategic significance	Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Time to target condition	Standard difficulty of enhancement	Applied difficulty multiplier	Hedge units delivered	Assessor comments
	Baseline				**Post development/ post intervention habitats**	**Change in distinctiveness and condition**			**Difficulty risk multipliers**						
1	Native Hedgerow - Associated with bank or ditch	0.205	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medi - V.High	Good	Medium	0	0	Standard	Low	Standard	4.60	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
2	Native Species Rich Hedgerow - Associated with bank or ditch	0.241	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	4.93	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
3	Native Species Rich Hedgerow - Associated with bank or ditch	0.158	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	3.85	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
5	Native Hedgerow	0.197	Good	Medium	Native Species Rich Hedgerow with trees	Low - High	Good	Medium	0	0	Standard	Low	Standard	2.37	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
6	Native Species Rich Hedgerow with trees	0.124	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	3.14	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
7	Native Species Rich Hedgerow - Associated with bank or ditch	0.175	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	1.02	Interplant with appropriate native shrub species to increase species richness. Manage in accordance with LEMS to enhance hedge margin, establish appropriate height / width and allow development of standard trees.

Table A1.5. Hedgerow Enhancement Metric Summary Table

Baseline					Post development/ post intervention habitats											
						Change in distinctiveness and condition			Difficulty risk multipliers						
Metric Ref	Habitat	Length (km)	Condition	Strategic significance c	Proposed habitat	Distinctiveness movement	Condition	Strategic significance	Habitat advance in enhanced/years	Delay in starting habitat enhancement/years	Time to target condition	Standard difficulty of enhancement	Applied difficulty multiplier	Hedge units delivered	Assessor comments
9	Native Hedgerow - Associated with bank or ditch	0.069	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medium - V.High	Good	Medium	0	0	Standard	Low	Standard	0.45	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
10	Native Species Rich Hedgerow - Associated with bank or ditch	0.178	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	4.35	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
11	Native Species Rich Hedgerow - Associated with bank or ditch	0.114	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	2.33	Interplant with appropriate native shrub species to infill gaps. Manage in accordance with LEMS to enhance hedge margin, establish appropriate height / width and allow development of standard trees.
13	Native Hedgerow - Associated with bank or ditch	0.225	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medium - V.High	Good	Medium	0	0	Standard	Low	Standard	2.97	To be managed in accordance with LEMS to achieve all relevant condition criteria and maintain standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
16	Native Species Rich Hedgerow - Associated with bank or ditch	0.056	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	1.37	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
17	Native Species Rich Hedgerow - Associated with bank or ditch	0.171	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - V.High	Good	Medium	0	0	Standard	Low	Standard	3.50	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
19	Native Hedgerow with trees -	0.11	Good	Medium	Native Species Rich Hedgerow with trees -	High - V.High	Good	Medium	0	0	Standard	Low	Standard	2.79	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5

Table A1.5. Hedgerow Enhancement Metric Summary Table

Metric Ref	Baseline Habitat	Length (km)	Condition	Strategic significance c	Post development/ post intervention habitats Proposed habitat	Change in distinctiveness and condition Distinctiveness movement	Condition	Strategic significance	Difficulty risk multipliers Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Time to target condition	Standard difficulty of enhancement	Applied difficulty multiplier	Hedge units delivered	Assessor comments
	Associated with bank or ditch				Associated with bank or ditch										for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
20	Native Hedgerow - Associated with bank or ditch	0.167	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medium - V.High	Good	Medium	0	0	Standard	Low	Standard	0.99	To be managed in accordance with LEMS to achieve all relevant condition criteria and maintain standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
21	Native Species Rich Hedgerow with trees	0.112	Poor	Medium	Native Species Rich Hedgerow with trees	High - High	Good	Medium	0	0	Standard	Low	Standard	1.77	Manage in accordance with LEMS to maintain appropriate height / width and allow development of standard trees.
22	Native Hedgerow - Associated with bank or ditch	0.125	Poor	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medium - V.High	Good	Medium	0	0	Standard	Low	Standard	2.48	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
23	Native Hedgerow - Associated with bank or ditch	0.053	Good	Medium	Native Species Rich Hedgerow with trees	Medium - High	Good	Medium	0	0	Standard	Low	Standard	0.46	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
24	Native Hedgerow	0.05	Moderate	Medium	Native Species Rich Hedgerow with trees	Low - High	Good	Medium	0	0	Standard	Low	Standard	0.76	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
25	Native Hedgerow	0.052	Poor	Medium	Native Species Rich Hedgerow with trees	Low - High	Good	Medium	0	0	Standard	Low	Standard	0.76	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
26	Native Hedgerow with	0.082	Good	Medium	Native Species Rich Hedgerow	High - V.High	Good	Medium	0	0	Standard	Low	Standard	2.08	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of

Table A1.5. Hedgerow Enhancement Metric Summary Table

	Baseline				Post development/ post intervention habitats	Change in distinctiveness and condition			Difficulty risk multipliers					Hedge units delivered	Assessor comments
Metric Ref	Habitat	Length (km)	Condition	Strategic significance c	Proposed habitat	Distinctiveness movement	Condition	Strategic significance	Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Time to target condition	Standard difficulty of enhancement	Applied difficulty multiplier	Hedge units delivered	Assessor comments
	trees - Associated with bank or ditch				with trees - Associated with bank or ditch										standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
27	Native Hedgerow - Associated with bank or ditch	0.219	Good	Medium	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Medium - V.High	Good	Medium	0	0	Standard	Low	Standard	0.22	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
28	Native Species Rich Hedgerow	0.166	Good	Medium	Native Species Rich Hedgerow with trees	Medium - High	Good	Medium	0	0	Standard	Low	Standard	2.96	To be managed in accordance with LEMS to achieve all relevant condition criteria and allow development of standard trees; refer to Technical Note Tables A3.4 and A3.5 for details specific to hedge. All hedgerows represent terrestrial habitat links for GCN (South Gloucestershire BAP Species) Local meta population.
													Total	50.14	

Appendix 2: Baseline Habitat Condition Assessment

Table A2.1 Baseline Grassland (Modified Grassland) Condition 09/02/2022. Refer to Figure 3.

Compartment	BNG Condition Criteria (Parks *et al* 2021) P= Pass/ F = Fail							Condition
	1	2	3	4	5	6	7	
G1	F	P	P	F	P	P	F	Moderate
G2	F	P	P	P	P	P	F	Moderate
G3	F	F	P	P	P	P	F	Moderate
G4	F	F	P	P	P	P	F	Moderate
G5	F	P	P	F	P	P	P	Moderate
G6	F	P	P	P	P	P	F	Moderate
G7	F	P	P	P	P	P	P	Good
G8	F	P	P	P	P	P	F	Moderate
G9	F	P	P	P	P	P	P	Good
G10	F	F	P	P	P	P	F	Moderate

Table A2.2 Baseline woodland Condition 09/02/2022. Refer to Figure 3.

Compartment	BNG Condition Criteria (Parks *et al* 2021)													Score	Condition
	1	2	3	4	5	6	7	8	9	10	11	12	13		
W1	2	3	3	2	3	1	1	2	2	1	1	1	1	23	Poor
W2	2	3	3	2	2	3	3	3	2	2	1	1	2	29	Moderate

Table A2.3 Baseline Pond (non-Priory Habitat) Condition 09/02/2022. Refer to Figure 3.

Compartment	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail									Condition
	1	2	3	4	5	6	7	8	9	
P1	F	F	N/A	P	N/A	P	P	F	F	Poor
P2	F	F	N/A	P	N/A	P	P	F	F	Poor

Table A2.4 Baseline Tall Ruderal Condition 09/02/2022. Refer to Figure 3.

Compartment	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail				Condition
	1	2	3	4	
Tall Ruderal	F	P	F	F	Poor

Table A2.5 Baseline Hedgerow Condition 09/02/2022. Refer to Figure 3.

Hedge Ref	Hedgerow Type	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Condition
		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	
H1	Native Hedgerow - Associated with bank or ditch	P	P	P	P	P	F	P	P	F	N/A	Good
H2	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Poor
H3	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	P	F	P	P	F	N/A	Good
H4	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	F	F	F	P	P	F	N/A	Poor
H5	Native Hedgerow	P	P	P	P	P	F	P	P	F	N/A	Good

Table A2.5 Baseline Hedgerow Condition 09/02/2022. Refer to Figure 3.

Hedge Ref	Hedgerow Type	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Condition
		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	
H6	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	F	P	P	P	P	Good
H7	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Poor
H8	Native Hedgerow - Associated with bank or ditch	P	P	P	F	P	F	P	P	F	N/A	Good
H9	Native Hedgerow - Associated with bank or ditch	P	P	P	P	P	F	P	P	F	N/A	Good
H10	Outside redline – not included in assessment											
H11	Outside redline – not included in assessment											
H12	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	P	F	P	P	F	N/A	Good
H13	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	F	F	F	P	P	P	P	Poor
H14	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	P	P	P	P	F	N/A	Good
H15	Native Hedgerow - Associated with bank or ditch	F	F	P	F	F	F	P	P	F	N/A	Poor
H16	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	F	P	F	P	P	P	P	Good
H17	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	F	P	P	P	F	Good
H18	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	F	P	F	P	P	F	N/A	Good
H19	Native Species Rich Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Poor
H20	Native Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Poor
H21	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	F	P	P	P	P	Good
H22	Native Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Good
H23	Native Species Rich Hedgerow with trees	P	P	F	P	F	F	P	F	P	P	Poor

Table A2.5 Baseline Hedgerow Condition 09/02/2022. Refer to Figure 3.

Hedge Ref	Hedgerow Type	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Condition
		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	
H24	Native Hedgerow - Associated with bank or ditch	P	P	P	P	F	F	P	P	F	N/A	Poor
H25	Native Hedgerow - Associated with bank or ditch	P	P	P	P	P	F	P	P	F	N/A	Good
H26	Native Hedgerow	P	F	P	F	F	P	P	P	F	N/A	Moderate
H27	Native Hedgerow	P	P	P	F	F	F	P	F	F	N/A	Poor
H28	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	F	P	P	P	P	Good
H29	Native Hedgerow - Associated with bank or ditch	P	P	P	F	P	F	P	P	F	N/A	Good
H30	Native Species Rich Hedgerow	P	P	P	F	P	F	P	P	F	N/A	Good

Appendix 3: Post-construction Management and Interventions

Table A3.1 Grassland Management / Interventions to achieve BNG Metric Condition Target; refer to Figure 4

Proposed habitat	BNG Habitat Creation Metric	BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail							Expected Condition	Management / Interventions to achieve criteria
		1	2	3	4	5	6	7		
Wildflower Meadow (POS)	Other neutral grassland	P	P	P	P	P	N/A	N/A	Good	• Sow with appropriate species rich neutral grassland native meadow seed mix. • Establish low nutrient topsoil / subsoil profile appropriate for species rich meadow grassland. • Implement varied cutting regime with removal of arisings. • Spot treatment for non-native / undesirable species
Wet grassland (POS)	Other neutral grassland	P	P	P	P	P	N/A	N/A	Good	• Sow with appropriate species rich wet grassland native meadow seed mix • Establish low nutrient topsoil / subsoil profile appropriate for species rich meadow grassland. • Implement varied cutting regime with removal of arisings. • Spot treatment for non-native / undesirable species
Wildflower Meadow (Development POS)	Other neutral grassland	P	P	P	P	P	N/A	N/A	Good	• Sow with appropriate species rich neutral grassland native meadow seed mix (shade tolerant for hedgerow margins). • Implement varied cutting regime with removal of arisings. • Spot treatment for non-native / undesirable species
Amenity Grassland (Development POS)	Modified grassland	F	F	P	P	P	P	P	Moderate	• Managed as amenity grassland / playing fields. • Spot treatment for non-native / undesirable species

Table A3.2 Pond (Non-Priority Habitat) Management / Interventions to achieve BNG Metric Condition target.

Reference	Baseline Condition (refer to Table A2.3)	Post Development										Management / Interventions to achieve criteria
		BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail									Expected Condition	
		1	2	3	4	5	6	7	8	9		
P2	Poor	P	P	P	P	P	P	P	P	P	Good	• Excavate existing basin to establish permanent open water. • Manage surrounding vegetation to reduce shading of bank. • Plant with appropriate native aquatic / emergent/ marginal vegetation.

Table A3.2 Pond (Non-Priority Habitat) Management / Interventions to achieve BNG Metric Condition target.

Reference	Baseline Condition (refer to Table A2.3)	Post Development										Management / Interventions to achieve criteria
		BNG Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail									Expected Condition	
		1	2	3	4	5	6	7	8	9		
												• Monitor and remove non-native plants and any fish
New Ponds	N/A	P	P	P	P	P	P	P	P	P	Good	• Excavate to establish permanent open water. • Plant with appropriate native aquatic / emergent/ marginal vegetation. • Monitor and remove non-native plants and any fish

Table A3.3 Woodland Management / Interventions to achieve BNG Metric Condition target.

Compartment	Baseline Condition refer to Table A2.2)	Post Development Score														Management / Interventions to achieve criteria
		BNG Condition Criteria (Parks *et al* 2021)													Expected Condition	
		1	2	3	4	5	6	7	8	9	10	11	12	13		
W1	Poor (23)	2	3	3	3	3	2	2	3	2	2	1	3	3	Moderate (31)	• Create standing dead wood • Sow appropriate woodland ground flora mix and / or plug plant with native woodland species. • Increase diversity of woody species and under canopy • Manage access to prevent damage to ground
W2	Moderate (28)	2	3	3	3	3	3	3	3	2	3	1	3	3	Good (35)	• Create standing dead wood • Sow appropriate woodland ground flora mix and / or plug plant with native woodland species. • Increase diversity of woody species and under canopy • Manage access to prevent damage to ground
Other Woodland planting	N/A	2	3	3	3	3	3	3	3	2	3	1	1	3	Good (33)	• Plant diverse range of native woody species. • Sow appropriate woodland ground flora mix and / or plug plant with native woodland species. • Manage to encourage canopy cover and coppice to establish range of canopy tiers. • Maintain easement as open space • Under sow with woodland ground flora mix

Table A3.4 Hedgerow Management / Interventions to achieve BNG Metric Condition target.

Hedge Ref	Baseline (refer to Table A2.5)		Post Development												Management / Interventions to achieve Condition (refer to Table A3.5)
			Hedgerow Type	Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Expected Condition	
	Hedgerow Type	Condition		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2		
H1	Native Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H2	Native Species Rich Hedgerow - Associated with bank or ditch	Poor	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	2, 5, 7, 9
H3	Native Species Rich Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	5, 7, 9
H5	Native Hedgerow	Good	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H6	Native Hedgerow with trees - Associated with bank or ditch	Good	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 8, 9
H9	Native Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H12	Native Species Rich Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	5, 7, 9
H13	Native Species Rich Hedgerow - Associated with bank or ditch	Poor	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	2, 5, 7, 9

Table A3.4 Hedgerow Management / Interventions to achieve BNG Metric Condition target.

Hedge Ref	Baseline (refer to Table A2.5)		Post Development												Management / Interventions to achieve Condition (refer to Table A3.5)
			Hedgerow Type	Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Expected Condition	
	Hedgerow Type	Condition		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2		
H15	Native Hedgerow - Associated with bank or ditch	Poor	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	2, 6, 7, 9
H16	Native Species Rich Hedgerow with trees - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	2, 6, 7, 9
H17	Native Hedgerow with trees - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	5, 8, 9
H18	Native Species Rich Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	5, 7, 9
H19	Native Species Rich Hedgerow - Associated with bank or ditch	Poor	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	5, 7, 9
H21	Native Hedgerow with trees -Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 8, 9
H22	Native Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9

Table A3.4 Hedgerow Management / Interventions to achieve BNG Metric Condition target.

Hedge Ref	Baseline (refer to Table A2.5)		Post Development												Management / Interventions to achieve Condition (refer to Table A3.5)
			Hedgerow Type	Condition Criteria (Parks *et al* 2021) P= Pass,/ F = Fail										Expected Condition	
	Hedgerow Type	Condition		A1	A2	B1	B2	C1	C2	D1	D2	E1	E2		
H23	Native Species Rich Hedgerow with trees	Poor	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	3, 5, 8, 9
H24	Native Hedgerow - Associated with bank or ditch	Poor	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H25	Native Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H26	Native Hedgerow	Moderate	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	1, 2, 5, 7, 9
H27	Native Hedgerow	Poor	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 7, 9
H28	Native Hedgerow with trees - Associated with bank or ditch	Good	Native Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 5, 8, 9
H29	Native Hedgerow - Associated with bank or ditch	Good	Native Species Rich Hedgerow with trees - Associated with bank or ditch	P	P	P	P	P	P	P	P	P	P	Good	1, 2, 5, 7, 9
H30	Native Species Rich Hedgerow	Good	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	5, 7, 9
New Hedge	N/A	N/A	Native Species Rich Hedgerow with trees	P	P	P	P	P	P	P	P	P	P	Good	2, 4, 6, 7, 9

Table A3.5 Hedgerow Management / Interventions specified in Table A3.4

Code	Action
1	Interplant hedgerow with native woody species to increase species richness.
2	Interplant hedgerow with native woody species to infill gaps (total <10% no gaps greater than 5m).
3	Coppice or lay hedge to promote dense regrowth from base (<0.5m vertical gap at base of canopy).
4	Translocate existing hedgerow woody component to create species rich hedgerow.
5	Manage hedgerow to maintain minimum height and width > 1.5m.
6	Manage hedgerow to increase minimum height and width to > 1.5m.
7	Identify suitable trunks along length of hedgerow (> 1 per 30m of hedgerow), mark and avoid cutting during regular maintenance to establish standard trees. Plant new standards in hedgerows where existing trunks are not present.
8	Maintain health of existing standard trees within hedgerow.
9	Manage >1m width margin adjacent to hedgerow base (at least one side) to provide appropriate undisturbed vegetated buffer (<5% non-native or undesirable species).