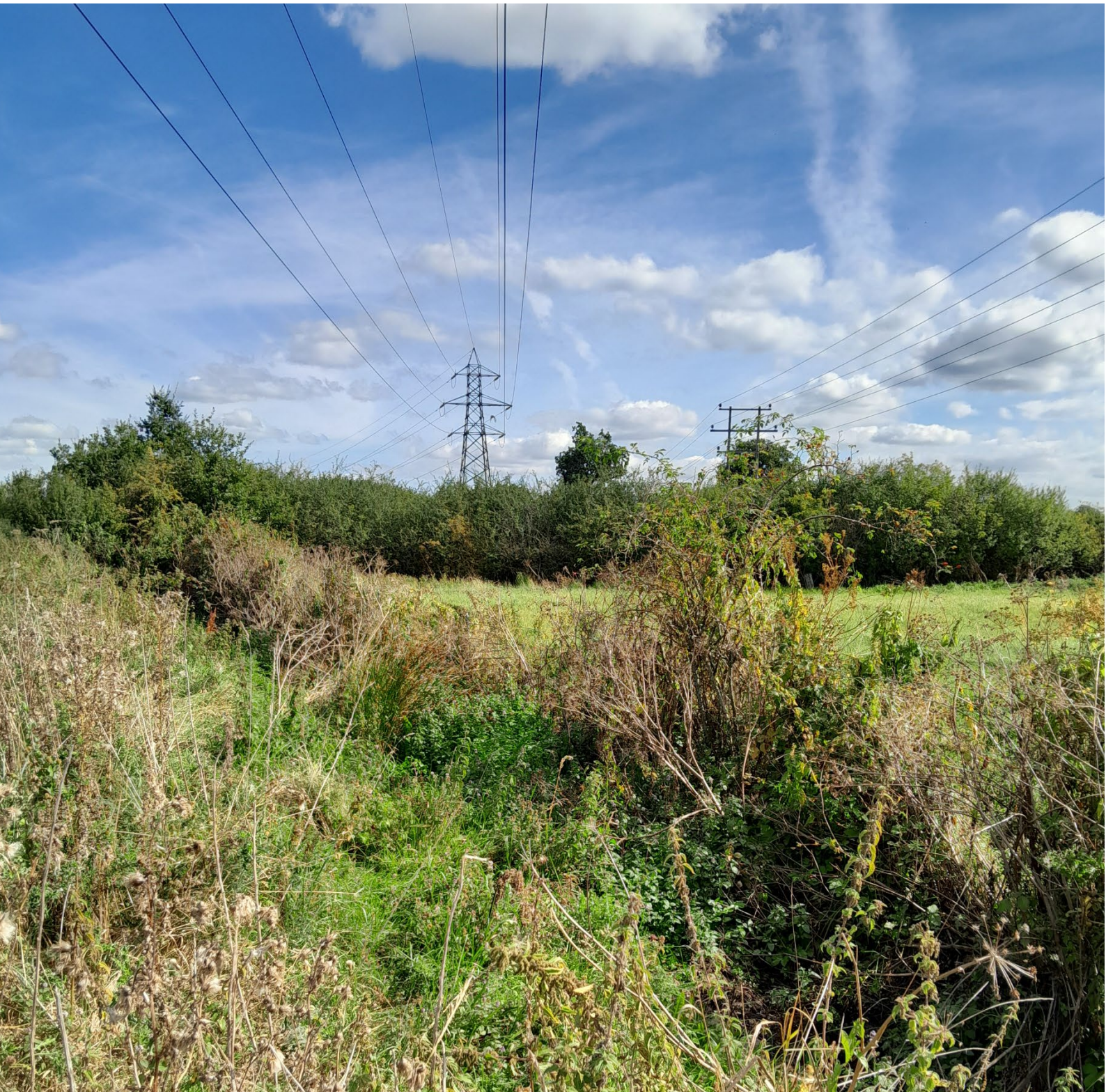
Lanpro

South Wokingham Distributor Road Biodiversity Net Gain Report



Biodiversity Net Gain Report

South Wokingham Distributor Road,

Wokingham,

RG40 2HP

Tony Gee and Partners LLP

January 2025

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Biodiversity Net Gain Report

4977 South Wokingham Distributor Road, Wokingham

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Contents

1 Introduction

1.1 Background

1.1.1 Lanpro Services Limited were commissioned by Tony Gee and Partners LLP to undertake a Biodiversity Net Gain (BNG) design and assessment in relation to the South Wokingham Distributor Road (SWDR), Wokingham, RG40 2HP, Central Grid Ref: SU 81226 67718 (the 'Site').

1.2 Purpose of Report

1.2.1 This Biodiversity Net Gain Report is to support the planning application for the construction of South Wokingham Distributor Road (SWDR), specifically for the discharge of Condition 15 (LPA Application Reference 213430), which is required before commencement, other than enabling works:

> *15. Prior to commencement of the development other than enabling works as established by the details approved pursuant to condition 3 a detailed Biodiversity Net Gain Strategy shall be submitted to and approved in writing by the local planning authority. The Strategy shall include:*
>
> *i) a biodiversity net gain calculator using the latest Defra metric and based on the detailed soft and hard landscape plans; and*
>
> *ii) details of any off-site offset scheme required to achieve a minimum 10% net gain over the baseline in all categories of the calculator.*
>
> *The approved strategy shall be implemented in full in the course of the development unless otherwise approved in writing by the local planning authority.*

1.2.2 This report outlines the methodology, assumptions, and limitations applied in calculating the site's proposed biodiversity net gain.

1.2.3 This report must be read in conjunction with the Metric's calculation tool excel spreadsheets which are provided separately. The Metric provides a calculation of the baseline, as quantified under DEFRA's Biodiversity Metric 3.1 ('the Metric'). In addition, the Metric provides a post-development BNG calculation based on the final landscape plan.

1.2.4 There are three accompanying files to this technical note, issued separately:

- Metric 3.1 spreadsheet. This shows the baseline and post-development scenario.
- Baseline Site habitat maps.
- Post-development Site habitat maps.

2 Methodology

2.1 Previous Work

2.1.1 WSP completed a Biodiversity Net Gain Assessment and BNG Metric 2.0 in January 2021. Initial Phase 1 habitat surveys of the Site were undertaken throughout 2017-2020, which were translated into UK Habitat Classification by WSP. The redline boundary of the scheme changed after the initial habitat surveys. Habitats not covered in the original surveys (approximately 1.79ha) were assessed by WSP using aerial photography.

2.1.2 WSP undertook retrospective condition assessments for the habitats on-site using information from the Preliminary Ecological Appraisals (PEA)[1] [2] and Botanical Survey Report[3].

2.1.3 A Water Framework Directive Assessment (WFDa)[4], adapted from a River Habitat Survey (RHS), was undertaken by WSP in 2020 for the watercourses related to the scheme. The WFDa data for the Emm Brook River was converted to MoRPh5 to assign initial condition scores by WSP.

2.1.4 An updated 'BMA Technical Note' and BNG Metric 3.0 was completed by Tony Gee and Partners LLP and Arcus Ecology in September 2021[5]. Arcus Ecology undertook an updated assessment of aerial imagery, whereby they confirmed and updated habitat baseline type and condition in line with the updated BNG Metric 3.0. However, Lanpro were not provided with the baseline habitat maps or GIS Shapefiles required to interpret this updated Metric 3.0.

2.1.5 As per discussions with Wokingham Borough Council, the original habitat data provided by WSP (Jan 2021) was used for this updated iteration of the BNG calculation using version 3.1 of the BNG metric.

2.1.6 It is important to note the differences between version 2.0 and version 3.1 of the BNG Metric:

- Baseline watercourse encroachment data is not required in version 2.0.
- Ditches are classified as area habitats, rather than linear habitats, in version 2.0.
- Habitat names differ between the two metrics.

1 WSP (2018) South West Distributor Road- Spine Road & Western Gateway: Preliminary Ecological Appraisal.

2 WSP (2020) South West Distributor Road- Spine Road & Western Gateway: 76A and 76B Finchampstead Road, Preliminary Ecological Appraisal.

3 WSP (2019) South West Distributor Road- Spine Road & Western Gateway: Botanical Survey Report.

4 WSP (2021) South West Distributor Road- Spine Road & Western Gateway: Water Framework Directive Assessment.

5 Tony Gee (2021) Wokingham Major Highways Programme - SWDR and WG1: BMA Technical Note

- As the metric has updated, some habitats have been renamed, removed, and added since version 2.0, as explained in section 2.2 below.

2.2 Baseline Habitats (On-site)

2.2.1 Ben Wagstaffe (BSc (Hons), MSc) conducted a Riparian Encroachment and Ditch Assessment on September 17th, 2024. The survey took place from 10:00am-4:00pm under 10% cloud cover, with an air temperature of 19°C and no precipitation.

2.2.2 The Site was walked over to record watercourse encroachment and extents, and locations were marked on printed aerial maps. Ditch condition was assessed according to the Statutory Biodiversity Metric condition sheets.

2.2.3 The initial Phase 1 habitat survey and BNG Metric 2.0 data and shapefiles, completed by WSP, were provided to Lanpro. Where necessary, habitat data was converted to the updated habitat types present in Metric version 3.1 using the Translation Phase 1 tab within the Metric and professional judgement from experienced ecologists. Where habitat types were not present in the updated Metric, the most suitable alternative habitat was selected.

2.2.4 Since the initial surveys conducted by WSP, the proposed development area has been modified. To determine the habitat types and condition of areas not included in the original surveys, aerial photography and data from surrounding habitat surveys were analysed to determine appropriate habitat types and condition. This approach was consistent with the methodology previously used by WSP and Arcus Ecology.

2.2.5 The habitat data provided by WSP and additional surveying and analysis undertaken by Lanpro was mapped in Quantum Geographic Information Systems (QGIS)[6].

2.3 Proposed Habitats

2.3.1 The location, condition, and type of proposed habitats has been assessed through reference to the following documents:

- WMHP-TG-SRWG1-DR-LS-300(1-9)
- 4977_LAN_XX_XX_RP_L_1001_ Landscape Management Plan P01
- 4977_LAN_XX_XX_RP_L_1000 Written Landscape Specification P02

2.3.2 The above plans provide indicative habitat types which were translated into UK Habitat types and condition for the Metric calculation by assessing the proposed planting and management against UKHab habitat definitions.

2.3.3 The WFD Assessment and proposed surrounding habitats were used to inform the post development condition for any watercourse loss, creation, and enhancements. An

6 "QGIS.org (2024). QGIS Geographic Information System. Open Source Geospatial Foundation Project. http://qgis.org

accredited assessor ran a River Condition Assessment (RCA) using the River MoRPH Methodology for the Emm Brook enhancement and the redirected Luckley brook and Emm Brook tributaries to model the proposed post-development scenario. The predicted results were input into Cartographer.io[7] to calculate the river condition.

2.3.4 Proposed habitats were mapped by overlaying the above Site Plan onto the baseline habitats in QGIS.

2.3.5 The Biodiversity Metric 3.1 GIS Import Tool was used to import data from the baseline and proposed development QGIS maps into the Biodiversity Metric 3.1 Calculation Tool[8]. Once imported, the biodiversity gain was calculated.

2.4 Assumptions and Limitations

General

2.4.1 The distinctiveness and time to target condition are automatically calculated within the Biodiversity Metric.

2.4.2 Within the Metric, habitat, hedgerow and watercourse units are often rounded to the nearest two decimal places. This can result in small differences between the totals shown in this report and the sum of all the individual unit values. All reported numbers are taken directly from the Metric's calculation tool.

2.4.3 Habitat data was consolidated where appropriate to simplify processing.

2.4.4 The riparian encroachment for river units was calculated based on the extent of built development within 10m (5m for ditches) of the centre line.

2.4.5 Wokingham/Berkshire does not currently have a finalised Local Nature Recovery Strategy which can be used to assign the 'strategic significance' of both baseline and proposed habitats. The following sources of information have been used to determine strategic significance:

- Local Green Spaces Assessment Report[9]
- Wokingham Biodiversity Action Plan [10]

2.4.6 Where habitats on Site were found to be in strategically significant locations as specified in the plans above, it was assigned 'formally identified in local strategy' in the Metric calculation tool with reference to the relevant plan. Habitats not included in local strategy but are recognised as ecologically significant were classified as 'Location ecologically

7 https://cartographer.io/

8 Archive Site for Legacy Biodiversity Metrics

9 Local Green Spaces Assessment Report (including Appendix 1 to 7

10 https://wokingham.moderngov.co.uk/Data/Executive%20-%20Individual%20Member%20Decisions/201402180945/Agenda/266687.pdf

desirable but not in local strategy'. All other habitats were identified as 'Area/compensation not in local strategy/no local strategy'.

BNG Baseline

2.4.7 All data provided by the original WSP Metric 2.0 was assumed to be accurate and correct and was translated, where necessary, to Metric 3.1 for the purpose of the present BNG calculation.

2.4.8 There is a discrepancy in the boundaries used for the BNG baseline calculations for future developments surrounding the road. The baseline completed by ECOSA[11] accounts for all land up to the permanent development area for the road (including all temporary works). Whereas the baseline completed by The Ecology Partnership[12] only provides baseline information up to the spine road's redline, while the master plans indicate proposed work beyond this redline. To avoid double counting, this updated BNG calculation only includes the permanent road works within the SWDR as per the final designs provided in December 2024.

2.4.9 The boundary of the post-development area changed since WSP's baseline mapping, so some habitats fall outside the surveyed area. Habitat type and condition outside the boundary were mapped by assessing neighbouring habitats and aerial photography.

2.4.10 In Metric 2.0, ditches are mapped as area habitats, not linear. All areas defined as ditches in the original report have been converted to their most appropriate neighbouring habitat. Additionally, aquatic Marginal vegetation, identified as area habitat ditches in the WSP Metric 2.0, was also assumed to be the most appropriate neighbouring habitat.

2.4.11 Scattered individual trees, provided as linear shapefiles by WSP, were assumed to be lines of trees in good condition.

2.4.12 Individual trees were missing from the WSP baseline. Individual tree locations and sizes were taken from the most up to date Arboricultural Impact Assessment[13] and were assumed to be in good condition.

2.4.13 Trees with Tree Preservation Orders (TPOs) were assumed to have medium strategic significance, as were hedgerows that contained TPOs.

2.4.14 The original WSP BNG calculation included a 73m^2 Pond (priority habitat) in good condition. The WSP Preliminary Ecological Appraisal[14] describes the pond as: "*A single pond is present within the Survey Area, set within a depression in grassland at the western extent. The banks are shallow (<50cm) and gently sloping. Sparse aquatic and emergent*

11 Land at Phase 2 of the Strategic Development Location Biodiversity Net Gain Assessment DRAFT August 2020

12 Habitat Condition Assessment November 2021

13 4977 South Wokingham Distributor Road - Arboricultural Impact Assesment Addendum - V1.3

14 WSP (2018), SOUTH WEST DISTRIBUTOR ROAD – SPINE ROAD & WESTERN GATEWAY: PRELIMINARY ECOLOGICAL APPRAISAL.

vegetation is present, namely rushes, but the banks are relatively bare. The pond is likely to dry occasionally, and has a leaf-litter bed, being overhung by several isolated willow trees.". Based on this description, the pond was lowered to Pond (non-priority habitat) within the metric calculation, in line with UKHab definitions. This results in a reduction in distinctiveness from High to Medium. Despite this, the introduction of high distinctiveness Temporary lakes, ponds and pools was deemed satisfactory to replace habitat loss even if it was to retain its original categorisation.

2.4.15 The original WFD Assessment[15] completed by WSP was converted to MoRPh and the Emm Brook was assigned a condition score of moderate. No score was given to the Emm Brook tributaries or Luckley Brook. As discussed with Wokingham Borough Council, the baseline condition for all the relevant watercourses within the Site were to be downgraded to 'Fairly Poor' due to over deepening, in line with the River MoRPh methodology.

2.4.16 Hedgerow habitats adjacent to wet ditches are not categorised as 'Associated with bank or ditch' within the hedgerow tab because wet ditches are accounted for in the watercourse tab. This prevents double counting of the ditch habitat, in accordance with the BNG Users Guide.

Post- development

2.4.17 It is assumed that habitats temporarily lost due to the construction of the proposed Haul Road would be restored to their original habitat type by the road contractor. Therefore, these habitats will not be included in this updated calculation as the haul road will fall in the remit of proposed future developments as above, and the baseline information has already been mapped by others. This assumption excludes any individual trees or hedgerows that will be recorded as permanently lost. Therefore, some hedgerow removal extends outside the post-development boundary.

2.4.18 All tree and hedgerow removal was recorded in line with the most up-to-date Arboricultural Impact Assessment[13].

2.4.19 Proposed Watercourse condition and encroachment were assumed from the Water Framework Directive Assessment and converted into MoRPh5 to assign condition scores (Table 2).

2.4.20 Due to the large difference in the diverted Upper Emm Brook Tributaries and Luckley Brook watercourse footprint between baseline and post-development, they have been recorded as habitat loss at baseline and creation at post-development.

2.4.21 The areas calculated using the BNG metric may differ from those outlined in the Soft Landscaping Planting Plan and proposed planting schemes due to slight differences when drawing habitat plans and because the BNG metric assigns no area (hectares) to linear habitats, such as hedgerows, while landscape plans do. The BNG metric assumes that the area below and surrounding linear habitats will contribute to the adjoining area habitat and, therefore, should be included in the calculation to provide an accurate

15 WSP (2021), Water Framework Directive Assessment

representation of the habitat and potential net gain. As a result, there will be a small variance in the habitats surrounding hedgerows compared to the Soft Landscaping Planting Plan. It is important to note that the primary function of the BNG metric is to provide an estimated value for the expected changes in biodiversity rather than to inform the detailed planting specification.

2.5 Translation of the Soft Landscaping Planting Plan into UKHab habitats

2.5.1 Habitats proposed within the Soft Landscaping Planting Plan have been interpreted into UK Habitat types, based on seed and species mixes, to allow for their inclusion within the Metric. Additionally, target habitat conditions have been assigned based on the prescription and management noted within the LEMP, in line with the BNG condition assessment sheets. These interpretations are detailed in Table 1 below.

Table 1. Interpretation of Proposed Soft Landscaping to UK Habitats

Soft Landscaping Planting Plan Habitat Type	Description	Assumed UK Habitat Type and Condition	Justification
Hedgerow Mix with Hedgerow Trees	Hedgerow Mix, double staggered, 5/m	Native Species Rich Hedgerow with trees Moderate condition	All proposed hedgerows contain standard trees and have over five native species. Therefore, the hedgerows are identified as species-rich native hedgerows with trees. It is unlikely that the hedgerows will have <20% plant species indicative of nutrient enrichment soils and have >1m width of undisturbed ground in some areas due to their proximity to the road. Additionally, trees within the hedgerows will not contain more than one age class. Therefore, good condition should not be targeted.
Standard Tree Planting in a continuous line	-	Line of trees Moderate condition	The trees planted will not have veteran features and, therefore, cannot reach good condition.
Individual Trees	-	Urban Trees Moderate condition	All trees are assumed to be under 30cm (diameter at breast height) when planted. Trees have not been assigned as good condition as they will not be mature or have ecological niches. Additionally, some trees may not have 20% of their canopy oversailing vegetation.
Woodland Mix	Woodland Mix, 1/m^2	Other Woodland; Broadleaved Moderate condition	The parcels will contain over 25% tree cover that are over 5m tall, in line with the UKHab definition for woodland and forest. The condition has been assigned as moderate as the woodland parcels will not contain multiple age classes, veteran trees, or three or more storeys. The woodland will have no significant wild and domestic herbivore damage, a mix of over five native species with a canopy and understory cover of 80%, available

Soft Landscaping Planting Plan Habitat Type	Description	Assumed UK Habitat Type and Condition	Justification
			temporary open space spaces, and no invasive species. Deadwood will be present as log piles, and the woodlands will include a developed shrub layer.
Wet Woodland Mix	Wet Woodland Mix, 1.5/m^2	Wet Woodland Moderate condition	Woodland areas have been proposed as wet woodland due to their proximity to the river and their presence within the flood zone. The species mix is appropriate and in line with UKHab definitions. The condition of this habitat are assigned as above.
Woodland Edge Mix	Woodland Edge Mix, 1/m^2	Mixed Scrub Moderate condition	This habitat is unlikely to reach good condition as it would be difficult to achieve mature trees and clearings, glades, or rides within the scrub.
Native Shrub Mix	-		
Wet Shrub Mix	-		
Rain Garden/ Wetland Mix	EM8 - Meadow Mixture For Wetlands (or similar approved) Emorsgate, 4g/m^2	Rain Garden Moderate condition	The proposed seed mixes have good floral diversity. However, achieving varied sward heights may be difficult within the small scale of the rain gardens. Moderate condition has been targeted.
Flowering Lawn Mix	EL1 - Flowering Lawn Mixture (or similar approved) Emorsgate, 4g/m^2	Modified grassland Moderate condition	The more intensive management regime and proximity to the road will likely prevent the grassland from meeting all the necessary criteria for good condition, particularly varied sward height and absence of physical damage.
Wildflower Meadow Mix	EM3 - Special General Purpose Meadow Mixture (or similar approved) Emorsgate, 4g/m^2	Other neutral grassland Moderate condition	The proposed seed mixes have appropriate floral diversity to achieve moderate condition. The management regime is also suitable for targeting moderate condition. Due to the small scale of some of the planting areas, varied sward heights and 10 or more vascular plants per m2 may not be feasible.
Wildflower Meadow Mix (Semi-Shade)	EH1 - Hedgerow Mixture (or similar approved), Emorsgate, 4g/m^2		
Translocated Turf	Translocated turf area to be overseeded with EM3 - Special General Purpose Meadow Mixture (or similar approved) Emorsgate, 4g/m^2		
Herbaceous Riparian Mix	Herbaceous Riparian Mix, 5/m^2		
Rain Garden/ Wetland Mix	EM8 - Meadow Mixture for Wetlands (or similar approved) Emorsgate, 4g/m^2		
Herbaceous Riparian Mix	Herbaceous Riparian Mix, 5/m^2	Other neutral grassland Good condition	Areas of riparian Planting Mix, Wet Meadow Mix and Wildflower Meadow Mix surrounding the Emm Brook and diverted Luckley brook, and within and leading to the SANG have been assigned as good condition. These large areas of grassland have a greater possibility of achieving good condition as they are mostly set back from the road and will be less intensively
Rain Garden/ Wetland Mix	EM8 - Meadow Mixture For Wetlands (or similar approved) Emorsgate, 4g/m^2		
Wildflower Meadow Mix (Semi-Shade)	EM3 - Special General Purpose Meadow Mixture (or similar approved) Emorsgate, 4g/m^2		

Soft Landscaping Planting Plan Habitat Type	Description	Assumed UK Habitat Type and Condition	Justification
Rain Garden/ Wetland Mix 2	EM8 - Meadow Mixture for Wetlands (or similar approved) Emorsgate, 4g/m^2		used/impacted by the public. The proposed seed mixes have appropriate floral diversity.
Backwater	-	Other neutral grassland Moderate condition	The backwaters are included within the watercourse module. All terrestrial habitat within the backwater is identified as moderate condition other neutral grassland.
Scrape	-	Temporary Lakes, ponds and pools Moderate condition	Assumed to hold water for <6 months of the year, in line with UKHab definitions. Due to the proximity to the new road, scrapes are not assigned good condition. However, the ponds will be no more than 50% shaded (excluding the woodland scrape), not artificially stocked with fish, have no artificial connection to other water bodies, have an absence of non-native species, have fluctuating water levels, and have semi-natural habitat surrounding the scrapes.
All highway and development work	-	Developed land; sealed surface	

Table 2. River MoRPh Assessment of the Proposed Watercourse Creation and Enhancement.

River MoRPh Category	Diverted Luckley Brook and Emm Brook Tributaries	Emm Brook Enhancement
A6: Bedrock Reaches	FALSE	FALSE
A7: Coarsest Bed Material Size Class	Gravel-Pebble	Gravel-Pebble
A8: Average Alluvial Bed Material Size	Sand	Sand
B1: Bank top vegetation structure	2	2
B2: Bank top tree feature richness	0	0
B3: Bank top water-related features	0	0
B4: Bank top NNIPS cover	0	0
B5: Bank top managed ground cover	-4	-2
C1: Bank face riparian vegetation structure	2	1
C2: Bank face tree feature richness	0	0
C3: Bank face natural bank profile extent	0	3
C4: Bank face natural bank profile richness	0	1
C5: Bank face natural bank material richness	2	2
C6: Bank face bare sediment extent	1	1
C7: Bank face artificial bank profile extent	-4	0

C8: Bank face reinforcement extent	-4	-3
C9: Bank face reinforcement material severity	0	0
C10: Bank face NNIPS cover	0	0
D1: Channel margin aquatic vegetation extent	2	2
D2: Channel margin aquatic morphotype richness	0	0
D3: Channel margin physical feature extent	3	1
D4: Channel margin physical feature richness	1	1
D5: Channel margin artificial features	-2	0
E1: Channel aquatic morphotype richness	4	3
E2: Channel bed tree features richness	0	0
E3: Channel bed hydraulic features richness	2	0
E4: Channel bed natural features extent	3	3
E5: Channel bed natural features richness	1	1
E6: Channel bed material richness	2	2
E7: Channel bed siltation	0	0
E8: Channel bed reinforcement extent	-3	-1
E9: Channel bed reinforcement severity	0	0
E10: Channel bed artificial features severity	0	0
E11: Channel bed NNIPS extent	0	0
E12: Channel bed filamentous algae extent	0	0
Positive Index Average	1.31579	1.210526
Negative Index Average	-1.30769	-0.46154
Condition Score	0.008097	0.748988
Condition	**Moderate**	**Moderate**

3 Results

3.1 Baseline Area Habitats

3.1.1 The baseline habitat data provided by WSP, edited to fit Metric 3.1, are mapped (provided separately) according to the UK Habitat Classification system, which is largely compatible with the Metric. Habitats recorded within the red line boundary included:

- Cereal Crops (c1c)
- Modified grassland (g4)
- Other neutral grassland (g3c)
- Bramble Scrub (h3d)
- Ruderal/Ephemeral (81)
- Vacant/derelict land/bareground (secondary code: 510)
- Developed land; sealed surface (UKHab code: u1b)
- Introduced shrub (847)
- Vegetated Garden (828)
- Ponds (Non-Priority habitat) (42)
- Wet woodland (w1d)
- Urban Tree (200)

3.1.2 No areas area of irreplaceable habitat is located on-Site.

3.1.3 All woodland habitat was considered to be medium strategic significance as they are noted within the documents outlined in paragraph 2.4.5 and due to the proximity to local wildlife site ancient woodland.

3.1.4 The total area of the Site within the redline boundary was calculated at 17.45ha (excluding trees) and the area-based habitats generated 73.86 Habitat Units (HU) (Table 3).

Table 3. Baseline Habitat Units

Habitat Type	Area (hectares)	Distinctiveness	Habitat Condition	Strategic Significance	Habitat Units (HU)
Cereal crops	3.988	Low	Condition Assessment N/A	Low Strategic Significance	7.98
Modified grassland	0.0084	Low	Poor	Low Strategic Significance	0.02
Modified grassland	3.1724	Low	Poor	Low Strategic Significance	6.34

Habitat Type	Area (hectares)	Distinctiveness	Habitat Condition	Strategic Significance	Habitat Units (HU)
Other neutral grassland	4.1234	Medium	Moderate	Low Strategic Significance	32.99
Other neutral grassland	0.0052	Medium	Poor	Low Strategic Significance	0.02
Other neutral grassland	4.1359	Medium	Poor	Low Strategic Significance	16.54
Bramble scrub	0.597	Medium	Condition Assessment N/A	Low Strategic Significance	2.39
Bramble scrub	0.0347	Medium	Condition Assessment N/A	Low Strategic Significance	0.14
Ponds (Non-Priority Habitat)	0.0073	Medium	Good	Low Strategic Significance	0.09
Ruderal/Ephemeral	0.0021	Low	Poor	Low Strategic Significance	0.00
Ruderal/Ephemeral	0.2464	Low	Poor	Low Strategic Significance	0.49
Vacant/derelict land/ bareground	0.233	Low	Poor	Low Strategic Significance	0.47
Developed land; sealed surface	0.5314	V.Low	N/A - Other	Low Strategic Significance	0.00
Introduced shrub	0.0082	Low	Condition Assessment N/A	Low Strategic Significance	0.02
Vegetated garden	0.0336	Low	Condition Assessment N/A	Low Strategic Significance	0.07
Ponds (Non-Priority Habitat)	0.0249	Medium	Poor	Low Strategic Significance	0.10
Wet woodland	0.2951	High	Good	Medium strategic significance	5.84
Wet woodland	0.0047	High	Good	Medium strategic significance	0.09
Urban Tree	0.0180864	Medium	Good	Low Strategic Significance	0.22
Urban Tree	0.00406944	Medium	Good	Medium strategic significance	0.05

Habitat Type	Area (hectares)	Distinctiveness	Habitat Condition	Strategic Significance	Habitat Units (HU)
Total Habitat Units					**73.86**

3.2 Baseline Hedgerow Habitats

3.2.1 The baseline hedgerow habitats on the Site are mapped (provided separately) according to the UK Habitat Classification system. Hedgerows recorded within the red line boundary included:

- Line of Trees (Ecologically Valuable) - with Bank or Ditch (34 & 50)
- Line of Trees (Ecologically Valuable) (34)
- Line of trees (33)
- Native hedgerow - associated with bank or ditch (h2a & 50)
- Native hedgerow with trees (h2a & 200)
- Native hedgerow (h2a)
- Native Species Rich Hedgerow - Associated with bank or ditch (h2a5 & 50)
- Native Species Rich Hedgerow with trees - Associated with bank or ditch (h2a5, 200 & 50)
- Native Species Rich Hedgerow with trees (h2a5 & 200)
- Native Species Rich Hedgerow (h2a5)

3.2.2 The total length of hedgerows on-Site was calculated at 1.59km and the hedgerow habitats generated 16.13 Hedgerow Units (HeU) (Table 4).

Table 4. Baseline Habitat Units

Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Hedgerow Units (HeU)
Line of Trees (Ecologically Valuable) - with Bank or Ditch	0.196	Medium	Moderate	Low Strategic Significance	1.57
Line of Trees (Ecologically Valuable)	0.103	Medium	Moderate	Low Strategic Significance	0.82
Line of Trees	0.192	Low	Good	Low Strategic Significance	1.15

Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Hedgerow Units (HeU)
Line of Trees	0.046	Low	Good	Medium strategic significance	0.30
Native hedgerow - associated with bank or ditch	0.012	Medium	Good	Low Strategic Significance	0.14
Native hedgerow - associated with bank or ditch	0.046	Medium	Good	Medium strategic significance	0.61
Native hedgerow with trees	0.183	Medium	Good	Low Strategic Significance	2.20
Native hedgerow	0.078	Low	Good	Low Strategic Significance	0.47
Native hedgerow	0.175	Low	Moderate	Low Strategic Significance	0.70
Native hedgerow	0.061	Low	Moderate	Low Strategic Significance	0.24
Native hedgerow	0.033	Low	Poor	Low Strategic Significance	0.07
Native hedgerow	0.029	Low	Poor	Medium strategic significance	0.06
Native Species Rich Hedgerow - Associated with bank or ditch	0.013	High	Good	Low Strategic Significance	0.23
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.023	V.High	Good	Low Strategic Significance	0.55
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.097	V.High	Good	Medium strategic significance	2.56

Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Hedgerow Units (HeU)
Native Species Rich Hedgerow with trees	0.18	High	Good	Low Strategic Significance	3.24
Native Species Rich Hedgerow with trees	0.019	High	Good	Medium strategic significance	0.38
Native Species Rich Hedgerow	0.104	Medium	Moderate	Low Strategic Significance	0.83
Total Hedgerow Units					16.13

3.3 Baseline Watercourse Habitats

3.3.1 The baseline watercourse habitats on the Site are mapped (provided separately) according to the UK Habitat Classification system. Watercourses recorded within the red line boundary or with riparian zones within the red line boundary included:

- Culvert (851)
- Ditches (50)
- Other Rivers and Streams (r2b)

3.3.2 The Emm Brook was considered to be high strategic significance as it is within the catchment planning system[16] and is highlighted within the documents outlined in paragraph 2.4.5. All other watercourses were assumed to be low strategic significance.

3.3.3 The total length of watercourses on-Site was calculated at 1.42km and the watercourse habitats generated 10.76 River Units (RU) (Table 5).

Table 5. Baseline Habitat Units

Location	Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Encroachment		River Units (RU)
						Water-course	Riparian	
Easthampstead Road Emm Brook tributary culvert	Culvert	0.026	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (road)	0.04
Luckley Brook culvert	Culvert	0.005	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (road)	0.01

16 https://environment.data.gov.uk/catchment-planning/

Location	Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Encroachment		River Units (RU)
						Water-course	Riparian	
Easthampstead Road Ditch culvert	Culvert	0.034	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (road)	0.05
Easthampstead Road Ditch culvert	Ditches	0.043	Medium	Poor	Low Strategic Significance	No Encroachment	Major (road)	0.13
Ditch north-east of Emm Brook	Ditches	0.05	Medium	Poor	Low Strategic Significance	No Encroachment	No Encroachment	0.20
Ditch south-east of Easthampstead Road	Ditches	0.063	Medium	Poor	Low Strategic Significance	No Encroachment	Major (road)	0.19
Ditch south-west of Emm Brook	Ditches	0.076	Medium	Poor	Low Strategic Significance	No Encroachment	No Encroachment	0.30
Ditch west of Easthampstead Road	Ditches	0.03	Medium	Poor	Low Strategic Significance	No Encroachment	Major (road)	0.09
South Emm Brook (adjacent to proposed SANG)	Other Rivers and Streams	0.048	High	Fairly Poor	High strategic significance	No Encroachment	No Encroachment	0.50
Emm Brook North of SWDR (after Luckley Brook Joins)	Other Rivers and Streams	0.061	High	Fairly Poor	High strategic significance	No Encroachment	Major (houses)	0.47
Emm Brook tributary east of Easthampstead Road	Other Rivers and Streams	0.179	High	Fairly Poor	Low Strategic Significance	No Encroachment	No Encroachment	1.61
Emm Brook tributary west of Easthampstead Road	Other Rivers and Streams	0.053	High	Fairly Poor	Low Strategic Significance	No Encroachment	No Encroachment	0.48

Location	Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Encroachment		River Units (RU)
						Water-course	Riparian	
Main Emm Brook North of SWDR	Other Rivers and Streams	0.358	High	Fairly Poor	High strategic significance	No Encroachment	No Encroachment	3.71
Luckley Brook	Other Rivers and Streams	0.252	High	Fairly Poor	Low Strategic Significance	No Encroachment	Major (road)	1.70
Northern Emm Brook tributary east of Easthampstead Road	Other Rivers and Streams	0.036	High	Fairly Poor	Low Strategic Significance	Major (headwalls and bank revetment)	No Encroachment	0.16
Emm Brook South of SWDR	Other Rivers and Streams	0.109	High	Fairly Poor	High strategic significance	No Encroachment	No Encroachment	1.13
	Total River Units							**10.76**

3.4 Post Development Habitat Loss

3.4.1 The post-development habitats are mapped (provided separately) according to the UK Habitat Classification system used by the Metric and assumptions listed in section 2.4.

3.4.2 The Development will result in the loss of all baseline area and hedgerow habitats.

3.4.3 The length of Emm Brook (0.549km) is proposed to be enhanced. The remaining watercourses are lost (0.87km), resulting in a loss of 5.24 RU.

3.5 Post Development Area Habitat Creation

3.5.1 The Development will result in the creation of 85.92HU (Table 6), resulting in a 12.06HU gain on Site and a 16.33% net gain.

Table 6. Area Habitat Creation

Soft Landscaping Planting Plan Habitat	Proposed Habitat Type	Area (ha)	Distinctiveness	Proposed Habitat Condition	Strategic Significance	Habitat Units (HU)
Rain Garden/ Wetland Mix (Channel of the diverted Emm Brook tributary from	Other neutral grassland	0.4117	Medium	Good	Low Strategic Significance	3.46

Soft Landscaping Planting Plan Habitat	Proposed Habitat Type	Area (ha)	Distinctiveness	Proposed Habitat Condition	Strategic Significance	Habitat Units (HU)
Easthampstead Road to Holme Park SANG)						
Rain Garden/ Wetland Mix (Within Holme Park SANG)	Other neutral grassland	0.0529	Medium	Good	Low Strategic Significance	0.44
Rain Garden/ Wetland Mix	Other neutral grassland	0.0882	Medium	Moderate	Low Strategic Significance	0.59
Rain Garden/ Wetland Mix (Grassland habitat around Luckley Brook (north of the SWDR), and alongside the Emm Brook and boardwalk)	Other neutral grassland	0.3234	Medium	Good	Low Strategic Significance	2.72
Flowering Lawn Mix	Modified grassland	1.5157	Low	Moderate	Low Strategic Significance	5.26
Translocated Turf	Other neutral grassland	0.1017	Medium	Moderate	Low Strategic Significance	0.68
Wildflower Meadow Mix (Adjacent to channel of the diverted Emm Brook tributary from Easthampstead Road to Holme Park SANG)	Other neutral grassland	0.1059	Medium	Good	Low Strategic Significance	0.89
Wildflower Meadow Mix (Grassland habitat around Luckley Brook (north of the SWDR), and alongside the Emm Brook and boardwalk)	Other neutral grassland	0.3114	Medium	Good	Low Strategic Significance	2.62
Wildflower Meadow Mix	Other neutral grassland	1.2199	Medium	Moderate	Low Strategic Significance	8.17
Wildflower Meadow Mix (Within Holme Park SANG)	Other neutral grassland	2.3117	Medium	Good	Low Strategic Significance	19.43
Backwater	Other neutral grassland	0.0308	Medium	Moderate	Low Strategic Significance	0.21
Herbaceous Riparian Mix	Other neutral grassland	0.9284	Medium	Moderate	Low Strategic Significance	6.22

Soft Landscaping Planting Plan Habitat	Proposed Habitat Type	Area (ha)	Distinctiveness	Proposed Habitat Condition	Strategic Significance	Habitat Units (HU)
Herbaceous Riparian Mix (Grassland habitat around Luckley Brook (north of the SWDR), and alongside the Emm Brook and boardwalk)	Other neutral grassland	0.9352	Medium	Good	Low Strategic Significance	7.86
Rain Garden/ Wetland Mix 2 (Within Holme Park SANG)	Other neutral grassland	1.0486	Medium	Good	Low Strategic Significance	8.81
Wildflower Meadow Mix (semi-shade)	Other neutral grassland	0.4294	Medium	Moderate	Low Strategic Significance	2.87
Wet Shrub Mix	Mixed scrub	0.1935	Medium	Moderate	Low Strategic Significance	1.30
Native Shrub Mix	Mixed scrub	0.1957	Medium	Moderate	Low Strategic Significance	1.31
Woodland Edge Mix	Mixed scrub	0.0723	Medium	Moderate	Low Strategic Significance	0.48
Scrape (Adjacent to Emm Brook and within Holme Park Sang)	Temporary lakes, ponds and pools	0.2577	High	Moderate	Low Strategic Significance	1.86
-	Developed land; sealed surface	5.2572	V.Low	N/A - Other	Low Strategic Significance	0.00
Rain Garden/ Wetland Mix	Rain garden	0.6616	Low	Moderate	Low Strategic Significance	2.38
Woodland Mix	Other woodland; broadleaved	0.4164	Medium	Moderate	Medium strategic significance	2.15
Wet Woodland Mix	Wet woodland	0.5824	High	Moderate	Medium strategic significance	3.02
Street tree/ Individual tree	Urban Tree	1.2411792	Medium	Moderate	Low Strategic Significance	3.79
Total Habitat Units						85.92

3.6 Post Development Hedgerow Creation

3.6.1 The Development will result in the creation of 19.13HeU (Table 7), resulting in a 3.00HU gain on Site and a 18.62% net gain.

Table 7. Hedgerow Habitat Creation

Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Hedgerow Units (HeU)
Native Species Rich Hedgerow with trees	2.277	High	Moderate	Low Strategic Significance	19.13
Total Hedgerow Units					19.13

3.7 Post Development Watercourse Enhancement

3.7.1 0.549km of the Emm Brook is proposed to be enhanced, creating 6.33RU (Table 8).

Table 8. Watercourse Enhancement

Location	Habitat Type	Length (km)	Baseline Habitat Condition	Proposed Habitat Condition	Baseline Encroachment		Proposed Encroachment		River Units (RU)
					Water-course	Riparian	Water-course	Riparian	
South Emm Brook (adjacent to proposed SANG)	Other Rivers and Streams	0.021	Fairly Poor	Moderate	No Encroachment	No Encroachment	No Encroachment	No Encroachment	0.26
Emm Brook North of SWDR (after Luckley Brook Joins)	Other Rivers and Streams	0.061	Fairly Poor	Moderate	No Encroachment	Major (houses)	No Encroachment	Major (developed land over 25% of riparian zone area)	0.57
Main Emm Brook North of SWDR	Other Rivers and Streams	0.358	Fairly Poor	Moderate	No Encroachment	No Encroachment	No Encroachment	No Encroachment	4.48
Emm Brook South of SWDR	Other Rivers and Streams	0.109	Fairly Poor	Moderate	No Encroachment	No Encroachment	No Encroachment	Major (developed land over 25% of riparian zone area)	1.02

Location	Habitat Type	Length (km)	Baseline Habitat Condition	Proposed Habitat Condition	Baseline Encroachment		Proposed Encroachment		River Units (RU)
					Water-course	Riparian	Water-course	Riparian	
	Total River Units								6.33

3.8 Post Development Watercourse Creation

3.8.1 The Development will result in the creation of 5.59RU (Table 9). When combined with the proposed river enhancement, 11.92RU are created, resulting in an a 1.16RU gain on Site and a 10.78% net gain.

Table 9. Watercourse Creation

Location	Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Encroachment		River Units (RU)
						Water-course	Riparian	
Culvert A	Culvert	0.036	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.05
Culvert B	Culvert	0.031	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.04
Culvert C	Culvert	0.02	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.03
Culvert D	Culvert	0.019	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.03
Culvert E	Culvert	0.018	Low	Poor	Low Strategic Significance	N/A - Culvert	No Encroachment	0.03
Culvert H	Culvert	0.027	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.04
Culvert J	Culvert	0.005	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.01
Culvert KL	Culvert	0.068	Low	Poor	Low Strategic Significance	N/A - Culvert	Major (SWDR)	0.10
Previously Emm Brook tributary	Other Rivers and Streams	1.092	High	Moderate	Low Strategic Significance	No Encroachment	No Encroachment	3.62
Previously Luckley Brook	Other Rivers	0.173	High	Moderate	Low Strategic Significance	No Encroachment	No Encroachment	0.57

Location	Habitat Type	Length (km)	Distinctiveness	Habitat Condition	Strategic Significance	Encroachment		River Units (RU)
						Water-course	Riparian	
	and Streams							
Previously North Emm Brook tributary - Thames water	Other Rivers and Streams	0.142	High	Moderate	Low Strategic Significance	No Encroachment	No Encroachment	0.47
Backwaters	Other Rivers and Streams	0.117	High	Moderate	Low Strategic Significance	No Encroachment	No Encroachment	0.39
Exit of Thames Culvert into SANG	Other Rivers and Streams	0.063	High	Moderate	Low Strategic Significance	No Encroachment	No Encroachment	0.21
Total River Units								5.59

4 Conclusion

4.1.1 The proposed Development will result in the creation of **85.92HU**, **19.13HeU**, and **11.92RU**, equating to a gain of **16.33%**, **18.62%,** and **10.78%,** respectively. Therefore, the proposed Development does achieve an overall scheme-wide biodiversity net gain of at least 10% across the three habitat categories.

4.1.2 It is noted that trading rules within the area habitat creation are not satisfied for wet woodland, a high distinctiveness habitat, as there has not been sufficient like-for-like habitat unit replacement. However, this is despite an increase of 0.4608ha of wet woodland. The proposed wet woodland is located around the diverted Luckley brook and enhanced Emm brook, surrounded by good condition other neutral grasslands (riparian and wetland mix), scrapes (high distinctiveness temporary ponds) and backwaters, and mixed scrub (wet shrub mix). This area will provide a mosaic of wetland habitats that will elevate the complexity of this floodplain area. Therefore, it is considered that a minor deviation from the trading rules should be acceptable. This is consistent with the consultation comments received from Wokingham Borough Council. Furthermore, additional scope for wet woodland creation is possible within the Holme Park SANG, which would be delivered by the wider masterplan.