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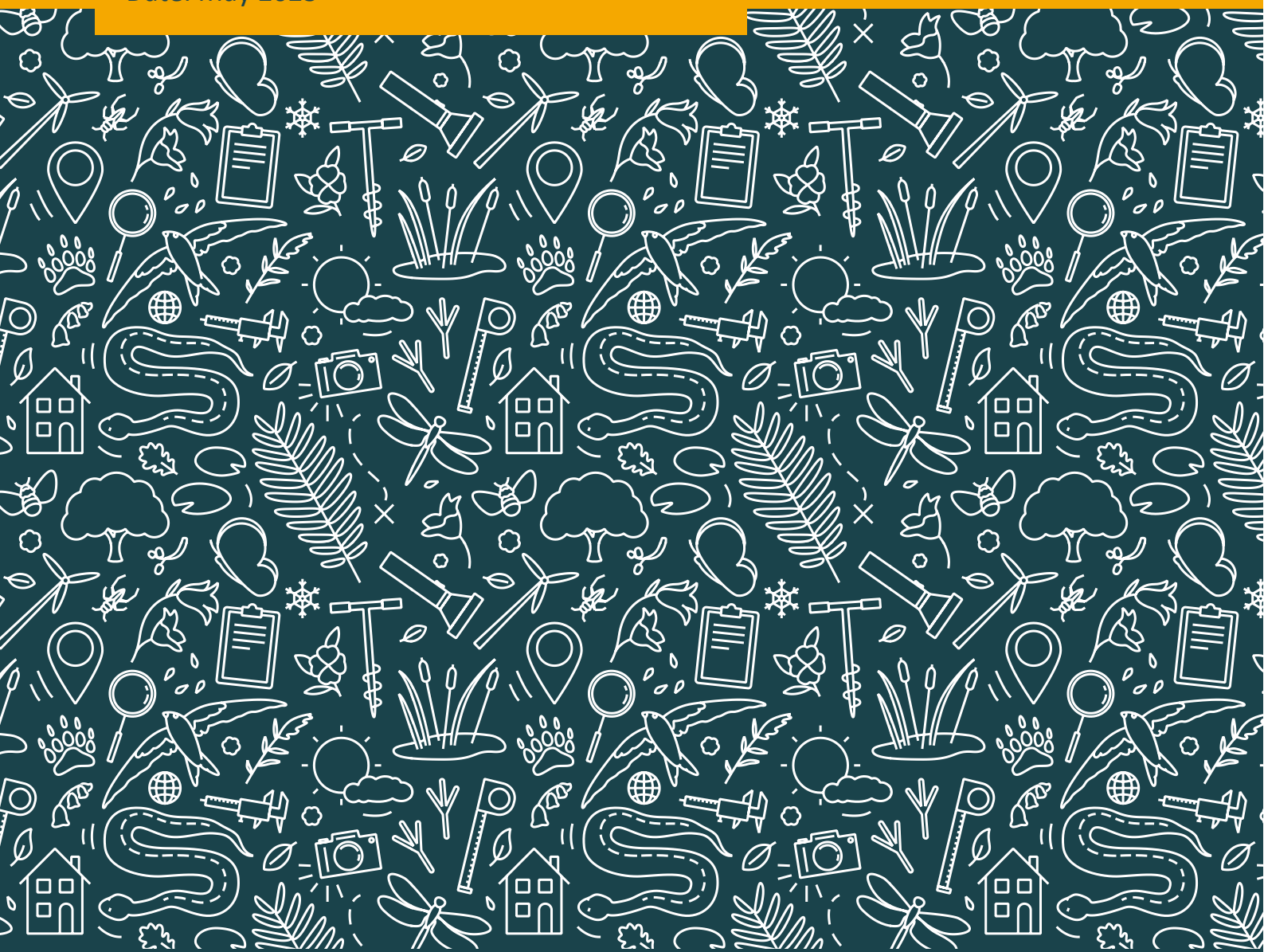
Biodiversity Metric Assessment

Orchard Lane, East Molesey

A Report To: CIRC Construction Management Ltd
Report Number: RT-MME-159247-02
Date: May 2023



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Quality Assurance

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Declaration of Compliance

This study has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of Practice for Planning and Development". The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Disclaimer

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client's brief, no site investigation can ensure complete assessment or prediction of the natural environment.

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Contents

1. Introduction

1.1 Project Background

In April 2023, CIRC Construction Management Ltd commissioned Middlemarch to undertake a Biodiversity Metric Assessment associated with a proposed development at Orchard Lane in East Molesey.

In October 2022 Middlemarch produced a Biodiversity Net Gain Assessment at this site for CIRC Management LLP (RT-MME-156895-RevA) which found the proposed development at the time delivering a net loss of habitat units. Soft landscaping has subsequently been revised and habitat enhancements in the field immediately north of the proposed development site (which is within the wider ownership boundary) have been incorporated into the net gain calculations. Approximately 0.1 ha of land within the proposed development boundary has also now been assessed.

The assessment is informed by a Preliminary Ecological Appraisal carried out of the site by Middlemarch (RT-MME-153535-01-RevB), two Arboricutural Surveys carried out by Arbtech, and a site visit on 14th April 2023 which focused on the northern field, the area of land previously unassessed, and clarifying baseline habitats at the western riverside boundary.

1.2 Site Description and Context

Table 1.1 provides a brief summary of the site and its surroundings.

Attribute	Description
Location	East Molesey
National Grid Reference	TQ 14620 67336
Site Area (ha)	0.75
Topography	Flat
Land Cover (on site)	The site was dominated by buildings and associated hardstanding, with patches of amenity grassland and areas of introduced shrub. There were scattered trees of varying maturity throughout the site with dense bramble scrub and introduced shrubs bordering the River Ember in the north-west of the site. In the north-east of the site was a large horticultural area which contained poor semi-improved grassland and scattered scrub. A small area of woodland falls adjacent to the horticultural area, continuing northwards beyond the development site boundary.
Land Cover (site surrounds)	The site was bordered by the gardens of residential houses to the east and by Orchard Lane to the south. The River Ember was adjacent to the site's western boundary and an area of rough grassland and woodland was present to the north of the site that forms part of the River Ember and River Mole green corridor. The wider landscape was dominated by residential development to the east and by the River Ember, River Mole Island Barn Reservoir (a Site of Nature Conservation Importance) and other habitats including woodland, rough grassland and scrub to the west.

Table 1.1: Summary of Site and Surroundings

1.3 Project Scope

The purpose of the Biodiversity Metric Assessment (BMA) is to identify the change in biodiversity value that may result from a change in land use (e.g. development) or management (e.g. biodiversity enhancement) at the site and to establish if a net gain for biodiversity can be achieved. The BMA utilises a biodiversity metric to provide a proxy measure of biodiversity based on habitat attributes, which can then be used to determine the relative change in biodiversity value resulting from any land use or management measures proposed.

It should be noted that the metric is only a proxy for biodiversity using habitat values, and that any proposed enhancements should be designed using appropriate ecological expertise. Existing levels of protection afforded to protected species and to habitats are not changed by use of the metric and statutory obligations will still need to be satisfied. In addition, the metric cannot account for impacts on, or enhancements to, irreplaceable habitats or protected sites, which will need to be assessed separately.

1.4 Summary of Proposals

The proposed development will comprise the clearance of existing buildings and habitats to facilitate a redevelopment. This assessment is based on the documentation detailed in the following documentation listed in Table 1.2.

Document / Drawing Number	Author
Landscape Proposal	Exterior Architecture
ExA Landscape Addendum	Exterior Architecture
Tree Retain + Removal Plan / 2241-EXA-XX-GF-DR-L-00150 Rev P05	Exterior Architecture
Roof Plan / A3711-ASA-ZZ-RP-DR-A-0215 Rev P21	Assael Architecture
General Arrangement Plan Ground Floor / 241-EXA-XX-GF-DR-L-00101 Rev P05	Exterior Architecture

Table 1.2: Documentation Provided by Client

2. Methods

2.1 Biodiversity Metric

The biodiversity calculations used within this assessment were undertaken by Harry Stone using 'The Biodiversity Metric 3.1' and associated User Guide[1] and Technical Supplement[2]. Sections 2.2 and 2.3 describe the data used for the assessment and the assumptions applied.

2.2. Data Sources

Existing Baseline

The baseline habitat data and condition assessment for the site is taken from the Preliminary Ecological Appraisal RT-MME-153535-01-RevB carried out by Middlemarch initially in September 2020. An additional walkover survey to inform this Preliminary Ecological Appraisal was carried out in July 2022. In April 2023 a further walkover was undertaken of offsite land within the broader ownership boundary. A Phase 1 Habitat Map showing the extent and location of each habitat recorded on site is included in Section 6 (C159247-02-01). Habitats mapped at the site's western riverside boundary in this drawing differ from those mapped previously produced by Middlemarch (C156895-01-01-RevB). Following closer inspection, an area previously assessed as dense bramble scrub has been reclassified as introduced shrub, and an area of land containing three sycamore trees between a fence and the river (previously misinterpreted as being offsite) has been better represented. In the interest of transparency these areas are pictured below:

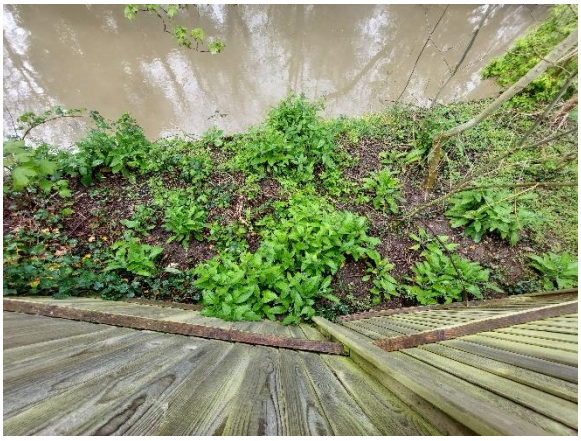


Plate 2.1: Ephemeral / short perennial vegetation between fence line and river

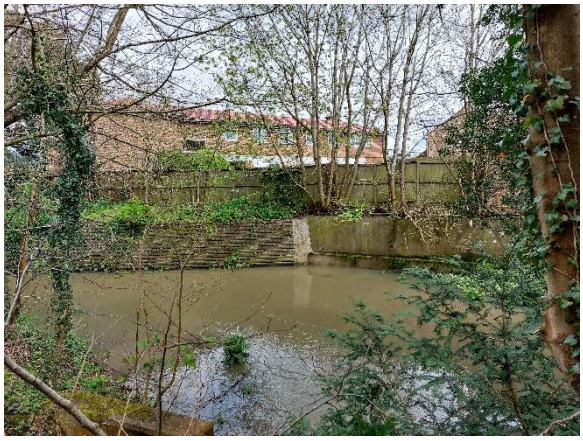


Plate 2.2: Area of land between fence line and river

[1] Panks, S., White, N., Newsome, A., Nash, M., Potter, J., Heyton, M., Mayhew, E., Alvarez, M., Russell, T., Cashon, C., Goddard, F., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B. and Stone, D. (2022) T*he Biodiversity Metric 3.1 – Auditing and accounting for biodiversity: User Guide*. Natural England.

[2] Panks, S., White, N., Newsome, A., Nash, M., Potter, J., Heyton, M., Mayhew, E., Alvarez, M., Russell, T., Cashon, C., Goddard, F., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B. and Stone, D. (2022) T*he Biodiversity Metric 3.1 – Auditing and accounting for biodiversity: Technical Supplement*. Natural England.

Plate 2.3: Habitat reclassified as introduced shrub

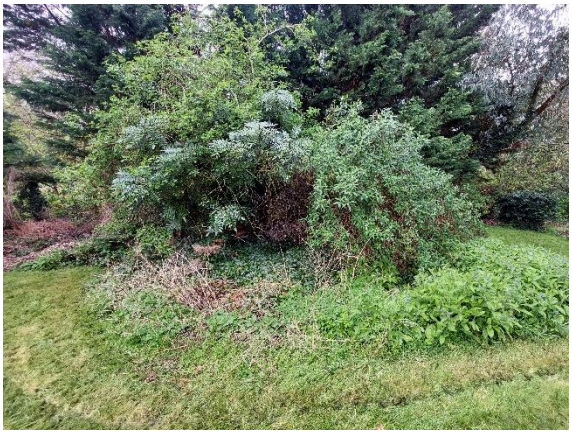


Plate 2.4: Habitat reclassified as introduced shrub

The Biodiversity Metric 3.1 calculator tool utilises the UK Habitat Classification System (UKHab) as the standard data input for habitats. Phase 1 Habitat Survey data for the site was subsequently converted for the purposes of the metric calculation using the Phase 1 habitats to UKHab translation feature, included in the Biodiversity Metric 3.1 calculator tool, or using professional opinion.

Each habitat or linear feature recorded within the site is assigned a score for 'Distinctiveness', 'Condition' and 'Strategic Significance'. Table 2.1 below describes how each habitat attribute has been determined for the existing baseline habitats in the metric assessment.

Attribute	Description
Distinctiveness	An automated score based on the type of habitat present and its value to wildlife. Highly diverse habitats such as those listed as Habitats of Principal Importance under the NERC Act (2006) or Annex 1 habitats in the Habitats Directive (1992) score highly in this category, whilst highly modified and low diversity habitats such as arable crops will have low distinctiveness scores.
Condition	A score based on the quality of the habitat parcel against published condition criteria.
Strategic significance	A score based on information set out in local plans or policies. In this instance, a strategic location was defined as areas identified in Elmbridge Borough Council's Core Strategy (2011) and Development Plan (2015)[3].

Table 2.1: Habitat Attributes for Existing Baseline Habitats

The value of each habitat parcel (or linear feature) is presented in terms of habitat (or hedgerow/river) 'biodiversity units' (BU).

Future Baseline

The future baseline conditions of the site are based on the revised soft landscaping plans. Table 2.2 below describes how each habitat attribute has been determined for the future baseline habitats in the metric assessment.

[3] Elmbridge Borough Council, *Current planning policies and guidance:* https://www.elmbridge.gov.uk/planning/local-plan/current-policies-and-guidance/

Attribute	Description
Distinctiveness	An automated score based on professional opinion about the projected habitat type proposed, taking into account the landscaping proposals detailed in the Soft Landscaping and Roof Plans.
Condition	A target condition score of the proposed habitat parcel based on professional opinion about the enhancement and future management proposals set out within the Landscape and Ecological Management Plan (Report RT-MME-160495-02).
Strategic significance	A score based on information set out in local plans or policies. In this instance, a strategic location was defined as areas identified in Elmbridge Borough Council's Core Strategy (2011) and Development Plan (2015).
Time to Target Condition	Time to target condition is automatically assigned in accordance with the Biodiversity Metric Tool 3.1. This multiplier can be adapted manually to reflect situations where a habitat is created in advance or where there is a delay in the project timescales for new habitat creation (e.g. project phasing).
Difficulty of Recreation	An automated value based on the difficulty of creating the target habitat. This value is unchanged from the values generated in Metric 3.1.

Table 2.2: Habitat Attributes for Existing Baseline Habitats

Following the calculation of the existing and future biodiversity value of the site, a calculation of the net biodiversity change is carried out to determine the 'Post-intervention habitat (or hedgerow/river) units', along with a figure for the percentage of net biodiversity impact loss (or gain).

2.3 Constraints and Assumptions

The following constraints and assumptions are applied to this report:

- For the purposes of this report, the term 'Habitat Loss' is applied to proposals that result in a change of habitat type or habitat 'distinctiveness'. This is defined in the Biodiversity Metric even where the new habitat type is created without any physical loss of the previous habitat type (e.g. creation of scrub over grassland). 'Habitat Enhancement' is applied where the habitat type and 'distinctiveness' remains the same, but the 'condition' of the habitat is improved.
- The BMA necessitates an estimation of future baseline values, based on professional opinion, to determine the change in biodiversity value that could occur as a result of the proposals at the site. The assumptions about target habitat types or condition in this report are based on professional opinion about the likely achievable outcomes at the site, based on the proposed planting plans and presumed management resources. All target habitats presume the implementation of a long-term Management Plan to achieve these ends and a recommendation to this effect is given in Chapter 4.
- The area of any new Urban Trees proposed is calculated using the Urban Tree Helper (as described above). For the purposes of this assessment, new trees proposed are assumed to be small (below 1/3 of their life expectancy) with the exception of 5 proposed trees which will be planted as extra heavy standard trees and comprise fast growing tree varieties targeting the medium size class.

3. Biodiversity Metric Calculation

3.1 Existing Habitats

The habitats identified during the Preliminary Ecological Appraisal are described in Table 3.1 and their value in biodiversity units (BU) is provided. The current extent of the habitats present is shown in Drawing C159247-02-01 in Chapter 5. The baseline metric calculations are provided in Appendix 1.

Phase 1 Habitat	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (distinctiveness, condition, connectivity and strategic significance)	Value (BU)
Area Based Habitats				
Amenity grassland	Modified grassland	0.158	Habitat is automatically classed as being of 'Low' distinctiveness. Assessed against the low-quality grassland condition criteria the habitat has been assigned a condition of 'Moderate'.	0.63
Bare ground	Vacant/derelict land/ bareground	0.001	Habitat is automatically classed as being of 'Low' distinctiveness. Assessed against the Urban condition criteria the habitat has been assigned a condition of 'Poor'.	0.00
Building and Hardstanding	Developed land; sealed surface	0.347	Habitat is automatically classed as being of 'Very low' distinctiveness, and due to its lack of habitat attributes is not assigned a condition score.	0.00
Dense scrub	Bramble scrub	0.056	Habitat is automatically classed as being of 'Medium' distinctiveness and 'Poor' condition.	0.22
Ephemeral / short perennial	Vacant/derelict land/ bareground	0.005	Habitat is automatically classed as being of 'Low' distinctiveness. Assessed against the Urban condition criteria the habitat has been assigned a condition of 'Poor'.	0.01
Introduced shrub	Introduced shrub	0.072	Habitat is automatically classed as being of 'Low' distinctiveness and 'Poor' condition.	0.14
Other habitat: weedproof membrane / polytunnel	Artificial unvegetated, unsealed surface	0.007	Habitat is automatically classed as being of 'Very low' distinctiveness, and due to its lack of habitat attributes is not assigned a condition score.	0.00
Poor semi-improved grassland	Other neutral grassland	0.098	Habitat is automatically classed as being of 'Medium' distinctiveness. Assessed against the grassland condition criteria, the habitat has been assigned a condition of 'Moderate'.	0.78

Table 3.1: Summary of Existing Habitats and Linear Features (continues)

Phase 1 Habitat	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (distinctiveness, condition, connectivity and strategic significance)	Value (BU)
Area Based Habitats				
Semi-natural mixed woodland	Lowland mixed deciduous woodland	0.007	Habitat is automatically classed as being of 'High' distinctiveness. Assessed against the woodland condition criteria, the habitat has been assigned a condition of 'Moderate'.	0.08
Scattered trees	Urban Tree	0.0624	Habitat is automatically classed as being of 'Medium' distinctiveness. Assessed against the Urban Tree condition criteria, the habitat has been assigned a condition of 'Good'.	0.75
Scattered trees	Urban Tree	0.3337	Habitat is automatically classed as being of 'Medium' distinctiveness. Assessed against the Urban Tree condition criteria, the habitat has been assigned a condition of 'Moderate'.	2.67
Total Area (ha)		**0.751**	**Total Habitat Baseline (BU)**	**5.30**
Hedgerows				
n/a	n/a	0	The development site contains no hedgerows.	0
Total Length (km)		**0**	**Total Hedgerow Baseline (BU)**	**0**
Rivers and Streams				
Running water	Other Rivers and Streams	0.097	Habitat is classed as being of 'High' distinctiveness. Full river condition assessment survey classified it as 'Fairly Poor' condition. The extent of both watercourse and riparian encroachment was assessed as 'Major'.	0.33
Total Length (km)		**0.097**	**Total River Baseline (BU)**	**0.33**

Table 3.1: Summary of Existing Habitats and Linear Features (continued)

3.2 Future Baseline and Impacts

Description of the Future Baseline

The future baseline for the purposes of this assessment is set out in proposed soft landscaping plans and roof plan. An adapted version of these plans is included in Chapter 6 showing how each landscaping area has been translated to a habitat type for the purpose of the Biodiversity Metric Assessment.

Impacts

Table 3.2 outlines the potential biodiversity impacts of the proposed development (including area proposed for retention, retained for enhancement, or habitats that are lost).

Phase 1 Habitat	UKHab Habitat	Habitats Retained		Habitat Retained for Enhancement		Habitat Loss	
		Area/Length (Ha/km)	Value (BU)	Area/Length (Ha/km)	Value (BU)	Area/Length (Ha/km)	Value (BU)
Area based habitats							
Amenity grassland	Modified grassland	0	0.00	0	0.00	0.16	0.63
Bare ground	Vacant/derelict land/ bareground	0	0.00	0	0.00	0.00	0.00
Building and Hardstanding	Developed land; sealed surface	0	0.00	0	0.00	0.35	0.00
Dense scrub	Bramble scrub	0.004	0.02	0	0.00	0.05	0.21
Ephemeral / short perennial	Vacant/derelict land/ bareground	0	0.00	0	0.00	0.01	0.01
Introduced shrub	Introduced shrub	0	0.00	0	0.00	0.07	0.14
Other habitat: weedproof membrane / polytunnel	Artificial unvegetated, unsealed surface	0	0.00	0	0.00	0.01	0.00
Poor semi-improved grassland	Other neutral grassland	0	0.00	0	0.00	0.10	0.78
Semi-natural mixed woodland	Lowland mixed deciduous woodland	0	0.00	0	0.00	0.01	0.08
Scattered trees	Urban Tree	0.0035	0.04	0	0.00	0.06	0.71
Scattered trees	Urban Tree	0	0.00	0.1619	1.30	0.17	1.37
Total Impact (Area habitats)		0.01	0.06	0.1619	1.30	-0.98	-3.95
Rivers and streams							
Running water	Other Rivers and Streams	0.00	0.00	0.097	0.33	0.00	0.00
Total Impact (Rivers and streams)		0.00	0.00	0.097	0.33	0.00	0.00

Table 3.2: Summary of Impacts

3.3 Habitat Creation / Enhancement

Table 3.3 below outlines the value of the proposed habitat creation/ enhancements in the development proposals.

Landscape Typology	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Habitats – Site Creation				
Buildings and Hardstanding	Developed land; sealed surface	0.425	Habitat is automatically classed as being of 'Very low' distinctiveness, and due to its lack of habitat attributes is not assigned a condition score.	0.00
Green Roof	Biodiverse green roof	0.034	The habitat type is automatically assessed as being 'Medium' distinctiveness with a targeted habitat condition of 'Good'.	0.19
Mixed Scrub - River Corridor Buffer	Mixed scrub	0.034	This habitat is automatically classed as being of 'Medium' distinctiveness with a targeted habitat condition of 'Moderate'.	0.23
Ornamental Planting	Introduced shrub	0.043	Proposed soft landscaping around much of the site. The habitat is automatically classed as being of 'Low' distinctiveness and 'Poor' condition.	0.08
Species rich lawn turf	Modified grassland	0.01	The habitat type is automatically assessed as being 'Low' distinctiveness with a targeted condition of 'Moderate.	0.03
Wildflower Turf	Other neutral grassland	0.195	The habitat type is automatically assessed as being 'Moderate' distinctiveness with a targeted condition of Moderate'.	1.31
Tree Planting	Urban Tree	0.1099	Habitat is automatically classed as being of 'Medium' distinctiveness with a targeted condition of 'Moderate'. The Urban Tree Helper was used to calculate the area on the assessment that 27 proposed trees will be 'small' sized.	0.34
Swale	Bioswale	0.007	The habitat type is automatically assessed as being 'Poor' distinctiveness and has been assessed as being in 'Poor' condition due to the lack of scope for achieving higher condition.	0.01
Total Creation (Area Habitats)		**0.75**	**Total Habitat Creation (BU)**	**2.19**

Table 3.3: Summary of Habitat Creation and Enhancement Proposals (continues)

Landscape Typology	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Habitats – Site Enhancement				
n/a	Urban Tree	0.3337	A row of mature leylandii trees and a single mature eucalyptus tree are to be enhanced from 'Moderate' to 'Good' condition by satisfying the condition assessment criteria 'C5: Micro-habitats for birds, mammals and insects are present'. This is to be achieved by the affixing of bird and bat boxes on these trees, establishing and encouraging the growth of common ivy on these trees, and the creation / preservation of dead wood features.	1.66
Total Enhancement (Area Habitats)		**0.00**	**Total Habitat Enhancement (BU)**	**1.66**
Habitats – Off Site Creation				
n/a	Urban Tree	0.3337	37 small native trees and 5 medium native trees in moderate condition will be planted immediately north of the proposed development. Habitat is automatically classed as being of 'Medium' distinctiveness. Assessed against the Urban Tree condition criteria, the habitat has been assigned a condition of 'Moderate'.	1.02
Total Creation (Area Habitats)		**0.00**	**Total Habitat Creation (BU)**	**1.02**

Table 3.3: Summary of Habitat Creation and Enhancement Proposals (continued)

Landscape Typology	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Habitats – Off Site Enhancement				
n/a	Other neutral grassland	0.431	An area of poor semi-improved neutral grassland to the north of the development boundary, assessed as being in 'Poor' condition, will be enhanced to 'Moderate' condition by satisfying condition assessment criteria C2 and C3. Full details of this enhancement are provided in the corresponding report Landscape and Ecological Management Plan (LEMP) RT-MME-159247-02.	2.93
n/a	Lowland mixed deciduous woodland	0.261	A parcel of woodland north of the development boundary, assessed as being in 'Poor' condition, will be enhanced to 'Moderate' condition by improving condition assessment criteria C3, C5, C9, C12 and C13. Full details of this enhancement are provided in the corresponding report LEMP report RT-MME-159247-02.	1.82
Total Enhancement (Area Habitats)		0.69	**Total Habitat Enhancement (BU)**	4.75
Hedgerows				
n/a	Native Species Rich Hedgerow	0.053	A new length of native species rich-hedgerow will be created on the northern boundary of the development, providing linear connectivity between east to the west habitats. The hedgerow is projected to achieve a condition of 'Good'.	0.41
Total Creation (Length)		0.053	**Total Hedgerow Creation (BU)**	0.41
Rivers and Streams - Enhancement				
	Other Rivers and Streams	0.10	Fairly poor → Moderate. Full details provided in Tables 8.1 and 8.2.	0.40
Total (Length)		0.10	**Total River Enhancement (BU)**	0.40

Table 3.3: Summary of Habitat Creation and Enhancement Proposals (continued)

3.4 Headline Results

Table 3.4 details the headline results. Full details of the biodiversity metric calculations can be found in Appendix 1.

	Habitat Units	Hedgerow Units	River and Stream Units
On-site baseline	5.30	0.00	0.33
On-site post-intervention	3.91	0.00	0.40
On-site net unit change	-1.39	0.00	0.07
On-site net % change	-26.27%	0.00	20.80%
Off-site baseline	3.29	0.00	0.00
Off-site post-intervention	5.77	0.41	0.00
Total net unit change	1.09	0.41	0.07
Total net % change	20.56%	100%	20.80%

Table 3.4: Biodiversity Metric Assessment – Headline Results

The existing value of the habitats on site is **5.30 BU**.

The proposals (on-site and off-site habitat loss, retention, enhancement and creation combined), as based on revised soft landscaping plans, roof plans and the corresponding Landscape and Ecological Management Plan (report RT-MME-160495-02), will deliver a net gain of **1.09 units**, a **20.56%** increase of baseline habitat value.

The existing value of the hedgerows on site is **0.00 BU**. The proposed development will create **0.41 units**, a **100%** increase of baseline hedgerow value.

The corresponding Invasive Species Method Statement (report RT-MME-153851-04-RevB) and Construction and Ecological Management Plan (report RT-MME-160495-01) detail how the stretch of River Ember at the site's western boundary will be enhanced from 'Fairly poor' condition to 'Moderate' condition, through the eradication of Japanese knotweed and the reduction of floating pennywort and Himalayan balsam to trace amounts (>5%), will deliver a net gain of **0.07 BU**, a **20.80%** increase of baseline river and streams value.

4. Discussion and Recommendations

4.1 Conclusions

Biodiversity Change

Net Gains

The BMA identified that the proposed development will result in a net gain of **1.09 BU** (Habitats), **0.41 BU** (Hedgerows) and **0.07 BU** (Rivers and streams). These gains compensate for all loss of these features and secures a net gain for biodiversity. This net gain exceeds the 10% net gain advocated by the Environment Act 2021. This ensures that the proposed development is compliant with planning policy for habitats, hedgerows and rivers and stream features (subject to long-term management) and so therefore no additional recommendations are given.

Landscape and Ecological Management Plan

The projected onsite habitat values given in this report are based on the assumption that an appropriate management plan will be implemented to ensure that the habitats and river features will be established and maintained to fulfil their intended biodiversity value. Biodiversity Net Gain Principles[4] necessitates that any biodiversity units claimed must be deliverable over a minimum period of 30 years. As such, the recommended management plan must provide long-term management proposals and provide scope for monitoring and reporting, to demonstrate that the intended values will be achieved over a minimum 30-year period. A recommendation to this effect is included in Section 4.2 below.

4.2 Recommendations

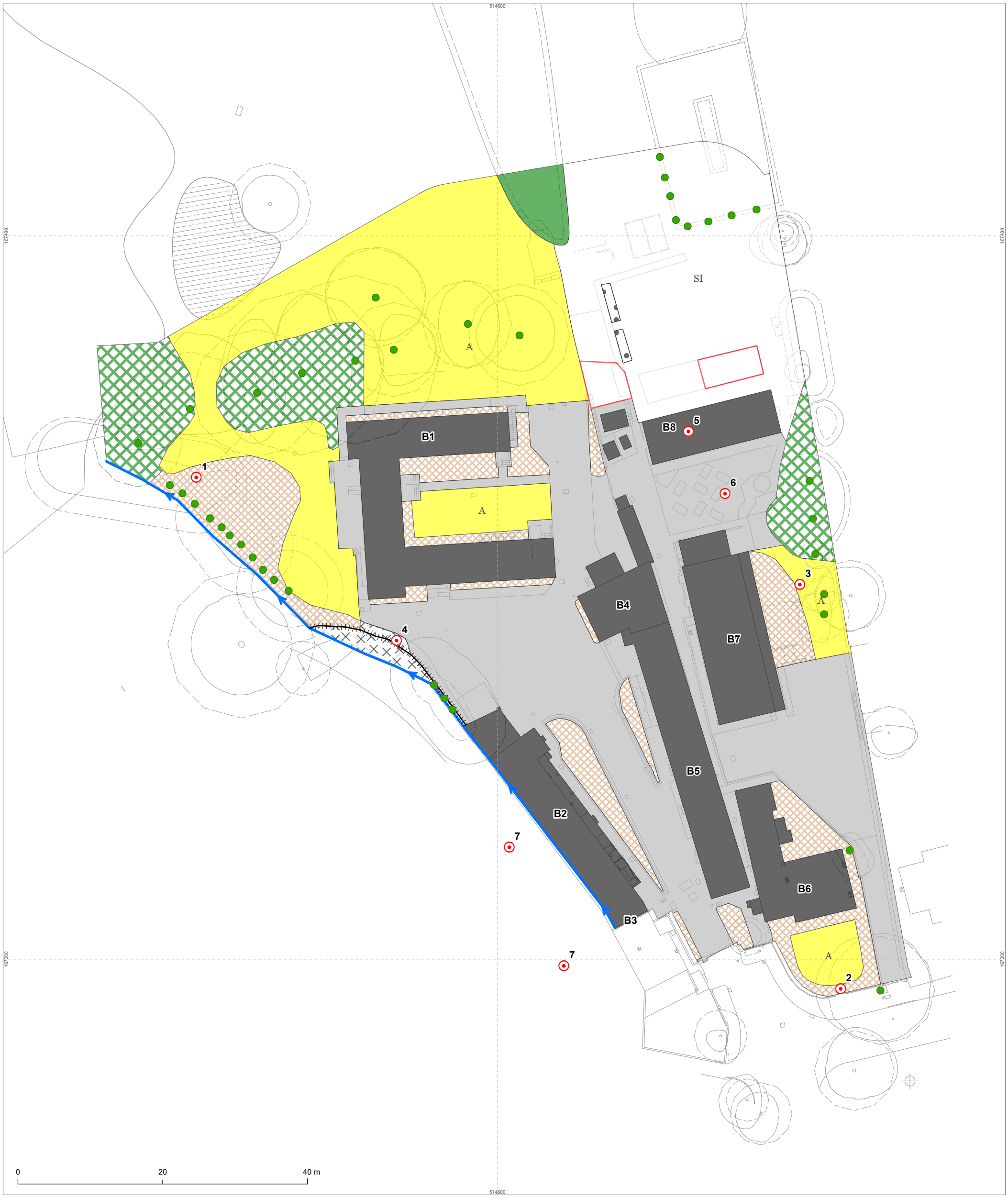
R1 A Landscape and Ecological Management Plan (LEMP, report RT-MME-160495-02) and a Construction Ecological Management Plan (CEcMP, report RT-MME-160495-01) have been produced for this proposed development. These corresponding reports should be read in tandem with this Biodiversity Metric Assessment. The LEMP sets out the appropriate establishment and management prescriptions required to achieve and maintain the intended type and condition of each habitat, hedgerow and river feature proposed. The LEMP cover a minimum period of 30 years and includes provisions for monitoring, review, reporting and contingency throughout.

[4] CIRIA, CIEEM, IEMA (2016) *Biodiversity Net Gain: Good Practice Principles for Development* [Available https://cieem.net/wp-content/uploads/2019/02/Biodiversity-Net-Gain-Principles.pdf]

5. Drawings

Drawing C159247-02-01 – Phase 1 Habitat Survey

Drawing C159247-02-02 - Drawing Adaptation of Landscape Strategy Proposal for Purposes of the BMA



Legend

- Site boundary
- Scattered tree
- Running water
- Fence
- A — Amenity grassland
- Bare ground
- Building
- Dense scrub
- Ephemeral / short perennial
- Hardstanding
- Introduced shrub
- Other habitat
- SI — Poor semi-improved grassland
- Semi-natural broad-leaved woodland
- Target note
  1. Log piles
  2. Cherry laurel
  3. Standing deadwood
  4. Tree stumps
  5. Greenhouse
  6. Raised planters
  7. Himalayan balsam and floating pennywort

N

Project	Orchard Lane, East Molesey
Drawing	Phase 1 Habitat Map
Client	CIRC Management LLP
Drawing Number	C159247-02-01
Revision	00
Scale @ A3	1:500
Date	May 2023
Approved By	HS
Drawn By	VO

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167400
167300
0
35
70 m

Legend

- Site boundary
- Removed tree
- Enhanced tree
- Proposed tree
- Proposed native species-rich intact hedgerow
- Building/hardstanding
- Dense scrub to be retained
- Grassland (moderate condition)
- Lowland deciduous broadleaved woodland (good)
- Mixed scrub in moderate condition
- Ornamental planting
- Other neutral (moderate) grassland
- Species rich lawn turf
- Swale planting
- Wildflower lawn turf
- River edge buffer - habitat to be retained and enhanced
- Reptile Mitigation Zone
- Tree Planting Zone - additional urban tree planting proposed on grassland (44 no., small trees - moderate condition)

N

Project: Orchard Lane, East Molesey

Drawing: Biodiversity Metric Assessment Proposals

Client: CIRC Management LLP

Drawing Number	Revision
C159247-02-02	00
Scale @ A3	Date
1:800	May 2023
Approved By	Drawn By
HS	VO/KB

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C159247-02-02

6. Condition Assessments

The following tables include full habitat descriptions and summarise the condition assessment for habitats, hedgerows and rivers using criteria published by Panks *et al.(2022)*

Area Habitat			Condition Sheet Criteria Score																
Phase 1 Habitat Type	**UK Hab Habitat Equivalent**	**Habitat Description**	**Condition Sheet Used**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**Total Score**	**Condition Assessment**
On-Site Baseline																			
Amenity grassland	Modified grassland	Areas of regularly mown grassland present in the north and east of the site, with a small area located in the south surrounded by introduced shrub. The sward was approximately 5 cm tall and was dominated by common species including perennial ryegrass *Lolium perenne*, annual meadow grass *Poa annua*, common yarrow *Achillea millefolium*, small-flowered crane's-bill *Geranium pusillum*, daisy *Bellis perennis*, ribwort plantain *Plantago lanceolata*, broadleaf plantain *Plantago major*, hawksbeard *Crepis* sp., red deadnettle *Lamium purpureum*, white clover *Trifolium repens* and creeping buttercup *Ranunculus repens*.	Grassland Low distinctiveness	F	F	P	P	P	P	P	-	-	-	-	-	-	5	Moderate
Bare ground	Vacant/derelict land/ bareground	Bare ground was recorded within the horticultural area in the northeast portion of the development site.	Urban	F	F	P	-	-	-	-	-	-	-	-	-	-	-	Poor
Building and Hardstanding	Developed land; sealed surface	There were 7 buildings onsite comprising six residential buildings and a horticultural centre. Several additional buildings were present on site including a large glass greenhouse in the horticultural area and a terrace of sheds. Three wooden garden sheds were also clustered nearby. Hardstanding was present throughout the site with hardstanding footpaths surrounding the buildings and a large area in the centre of the site for car parking and access. In the horticultural area in the north-east of the site, gravel and paving also covered large areas.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
Dense scrub	Bramble scrub	Dense scrub was present in the north-west corner of the site growing at the base of mature individual trees. The scrub was primarily consisted of bramble *Rubus fruticosus* agg. with dense ivy *Hedera helix*, common nettle *Urtica dioica*, buddleia *Buddleja davidii*, Oregon grape *Mahonia aquifolium* and wild honeysuckle *Lonicera periclymenum* also present. Some tree saplings were growing among the scrub.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Poor
Ephemeral / short perennial	Vacant/derelict land/ bareground	An area of land containing three sycamore trees between a fence and the river (previously misinterpreted as being offsite). Vegetation recorded growing here included chickweed *Stellaria media*, green alkanet, common ivy, cleavers *Galium aparine* and occasional scattered bramble	Urban	F	F	P	-	-	-	-	-	-	-	-	-	-	-	Poor
Introduced shrub	Introduced shrub	Areas of introduced shrub was present surrounding some of the buildings. Introduced shrub was also present in raised flower beds to the south of the horticultural centre. Species included Japanese anemone *Anemone hupehensis*, bay *Laurus nobilis*, rosemary Rosmarinus officinalis, firethorn *Pyracantha coccinea*, lavender	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A

Area Habitat			Condition Sheet Criteria Score																
Phase 1 Habitat Type	**UK Hab Habitat Equivalent**	**Habitat Description**	**Condition Sheet Used**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**Total Score**	**Condition Assessment**
		Lavandula angustifolia, Japanese meadowsweet *Spiraea japonica*, and leatherleaf viburnum *Viburnum rhytidophyllum*.																
Other habitat: weedproof membrane / polytunnel	Artificial unvegetated, unsealed surface	Weedproof membrane and disused polytunnels in the horticultural area.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
Poor semi-improved grassland	Other neutral grassland	An area of poor semi-improved grassland was present in the north-east corner of the site to the north of the horticultural area. The grass was mostly thick and tussocky with a sward height over 75 cm. It was dominated by false oatgrass *Arrhenatherum elatius* and Yorkshire fog. Cocksfoot *Dactylis glomerata*, common sorrel *Rumex acetosa*, foxglove *Digitalis lutea*, meadow buttercup *Ranunculus acris*, large-flowered evening-primrose *Oenothera glazioviana*, timothy grass *Phleum pratense* and common yarrow also grew in the tall sward area. In shorter sward areas the following additional species were recorded: creeping buttercup, red deadnettle, ground ivy, wall barley *Hordeum murinum*, dandelion, hawksbeard, bristly oxtongue *Helminthotheca echioides*, ribwort plantain and broadleaf plantain. Under the UKHAB classification system this grassland meets the criteria for 'g3c5: Arrhenatherum neutral grassland' – a neutral grassland dominated by false oatgrass.	Grassland Medium/High/Very High distinctiveness	P	P	P	F	P	F								4	Moderate
Semi-natural mixed woodland	Lowland mixed deciduous woodland	The 'tip' of a larger area of woodland was present at the development site's very northern boundary. This woodland contained willow, wild cherry, oak, hazel and sweet chestnut. The undergrowth was dense with brambles and dense low tree growth (primarily willow) to the south but opened up to the north (beyond the site boundary) where grasses, red deadnettle, cow parsley and several ferns grew in dappled shade.	Woodland	2	3	3	3	3	2	2	3	2	1	1	2	2	29	Moderate
Scattered trees	Urban Tree	A number of mature trees were scattered throughout the site, predominantly along the northern and western boundaries and in the area of amenity grassland by the eastern boundary. Condition assessments were carried out on a tree by tree basis, with reference to arboricultural data to generate areas for the Biodiversity Metric assessment. 15 trees of varying size class were assessed as being in 'Good' condition and 25 trees of varying size class were assessed as being in 'Moderate' condition.	Urban Tree	F/P	P	F/P	F/P	P	F/P	P	-	-	-	-	-	-	4-6	Good / Moderate
On-site baseline Running water	Other Rivers and Streams	The River Ember was situated immediately adjacent to the site's western boundary and occupying a channel approximately 10 m in width. The eastern riverbank consisted of very steep (vertical or near-vertical) hardstanding and was therefore considered unsuitable for burrowing species such as otter *Lutra lutra*, kingfisher *Alcedo atthis* and water vole *Arvicola amphibius*. This hardstanding was approximately 2 m at its lowest sections and constructed from a mix of concrete and brick. The western riverbank, by contrast, was more graduated and dominated by riparian vegetation. The riverbed was a mix of gravel, sand and silt. Various macrophytes were present including branched bur-reed *sparganium erec*tum, pendulous sedge *Carex pendula*, watercress *Rorippa nasturtium-aquaticum*, water lily *Nymphaea alba* and common duckweed *Lemna minor*. Invasive aquatic plants	Refer to Table 8.2	-	-	-	-	-	-	-	-	-	-	-	-	-		Fairly poor

Area Habitat			Condition Sheet Criteria Score																
Phase 1 Habitat Type	**UK Hab Habitat Equivalent**	**Habitat Description**	**Condition Sheet Used**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**Total Score**	**Condition Assessment**
		Himalayan balsam *Impatiens glandulifera* and floating pennywort *Hydrocotyle ranunculoides* were also present in abundance.																
On-Site Enhancement																		
Scattered trees	Urban Tree	A row of mature leylandii trees and a single mature eucalyptus tree are to be enhanced from 'Moderate' to 'Good' condition by satisfying the condition assessment criteria 'C5: Micro-habitats for birds, mammals and insects are present'. This is to be achieved by the affixing of bird and bat boxes on these trees, establishing and encouraging the growth of common ivy on these trees, and the creation/preservation of dead wood features.	Urban Tree	F	P	P	P	P	P	-	-	-	-	-	-	-	5	Good
Running water	Other Rivers and Streams	Habitat to be enhanced through the eradication of Himalayan balsam and floating pennywort, as well as the eradication of Japanese knotweed on its eastern bank top.	Refer to Table 8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Moderate
On-Site Habitat Creation																		
-	Developed land; sealed surface	A habitat condition assessment is not required.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
-	Biodiverse green roof	Biodiverse green roofing will be incorporated onto seven sections of roof across the site, the largest being towards the northeast of the development. These roofs have been assessed as being in 'Good' condition due to client commitment to the criteria set out in the Biodiversity Metric 3.1 supplement. They will therefore have a varied depth of 80-150 mm with at least 50% at 150 mm. They will also include additional habitat in the form of log piles and/or sand piles.	Urban	P	P	P	-	-	P	-	-	-	-	-	-	-	4	Good
-	Mixed scrub	Introduced shrub species will be removed at the site's west western boundary as part of the creation of a River Edge Buffer. Native scrub species will be planted here and the habitat managed in accordance with the corresponding LEMP (RT-MME-160495-02) to maintain a diversity of woody species, a good age range, absence of invasive species and a well-developed edge.	Scrub	P	P	P	P	F	-	-	-	-	-	-	-	-	4	Moderate
-	Introduced shrub	A habitat condition assessment is not required.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
-	Modified grassland	Species rich lawn turf. To be managed in accordance with the corresponding LEMP (RT-MME-160495-02).	Grassland Low distinctiveness	P	F	P	F	P	P	P	-	-	-	-	-	-	5	Moderate
-	Other neutral grassland	Wildflower lawn. To be managed in accordance with the corresponding LEMP (RT-MME-160495-02).	Grassland Medium/High/Very High distinctiveness	P	F	P	P	P	F	-	-	-	-	-	-	-	4	Moderate
-	Urban Tree	A mix of native and non-native trees, all classified as small-sized, will be planted throughout the development site.	Urban Tree	P/F	P	F	P	F	P	-	-	-	-	-	-	-	3-4	Moderate
-	Bioswale	A bioswale (described in proposals as Ecological Swale Planting) will be crated around the northeast corner of the northernmost building. Planting will consist primarily of introduced shrub species with pendulous sedge *Carex pendula*.	Urban	F	F	P	F	-	-	-	-	-	-	-	-	-	1	Poor

Area Habitat			Condition Sheet Criteria Score																
Phase 1 Habitat Type	**UK Hab Habitat Equivalent**	**Habitat Description**	**Condition Sheet Used**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**Total Score**	**Condition Assessment**
Off-Site Baseline																			
-	Other neutral grassland	Dominated by Yorkshire fog. Some dandelion, perennial ryegrass and taraxacum sp. but nothing interesting like cuckooflower or meadow foxtail. Thick clay soil. Sward height approx. shin-knee so 20-50 cm. No bare ground observed. Contained several young trees.	Grassland Medium/High/Very High distinctiveness	F	F	F	P	P	-	-	-	-	-	-	-	-	2	Poor
-	Lowland mixed deciduous woodland	A woodland with abundant Japanese knotweed and frequent cherry laurel in its understorey. Among these invasive species the ground flora consisted of common ivy (abundant) with frequent cow parsley, hogweed and herb robert. Occasional lords and ladies were noted. The southeastern portion of the woodland had been used as a dumping area for horticultural waste (grass cuttings, wood chippings, etc) which has caused the ground to become enriched in this area – exhibited by cleavers, stinging nettle and green alkanet growing in relative abundance.	Woodland	2	3	1	2	2	3	2	3	1	1	1	1	1	23	Poor
Off-Site Enhancement and Creation																			
-	Other neutral grassland	This habitat will be upgraded to 'Moderate' condition by satisfying condition assessment criteria C2 (varied sward height) and C3 (cover of bare ground). Long-term management of this habitat will aim to achieve 'good' condition with 'moderate' condition as minimum. Management prescriptions include an annual cut, maintaining field edes on a rotational basis, creation of bare ground and scarification followed by seeding if deemed necessary. Full details of this enhancement are provided in the corresponding report LEMP (LEMP) RT-MME-159247-02.	Grassland Medium/High/Very High distinctiveness	F	P	P	P	P	F	-	-	-	-	-	-	-	5	Moderate
-	Lowland mixed deciduous woodland	This habitat will be upgraded from 'Poor' to 'Moderate' condition by improving the scores of condition assessment criteria C3 (invasive plant species), C5 (cover of native tree and shrub species), C9 (vegetation and ground flora), C12 (amount of deadwood) and C13 (woodland disturbance). Full details of this enhancement are provided in the corresponding report LEMP (LEMP) RT-MME-159247-02.	Woodland	2	3	3	2	3	3	2	3	2	1	1	2	2	29	Moderate
-	Urban Tree	37 small and 5 medium trees to be planted within an offsite area of amenity grassland. Tree planting will comprise a minimum 70% native species and through appropriate management set out within the LEMP, a condition of 'Moderate' is targeted.	Urban Tree	P	F	F	P	F	P	-	-	-	-	-	-	-	3	Moderate
Hedgerow																			
-	Native Species-rich hedgerow	Creation of a new native species rich hedgerow between the development site and offsite habitats. Establishment and long-term management of this habitat set out within the LEMP target 'Good' condition		A1: P	A2: P	B1: P	B2: P	C1: P	C2: P	D1: P	D2: P	E1: n/a	E2: n/a	-: -	-: -	-: -	8	Good
Key: **P – Criteria passed** **F – Criteria failed** **<u>Woodland Condition Assessment</u>**																			

Area Habitat			Condition Sheet Criteria Score															
Phase 1 Habitat Type	UK Hab Habitat Equivalent	Habitat Description	Condition Sheet Used	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	Total Score	Condition Assessment
3 (points) = Good 2 (points) = Moderate 1 (point) = Poor Total Score: >32 = Good 26-32 = Moderate <26 = Poor																		

Table 8.1: Habitat and Hedgerow Descriptions and Condition Assessments

Category	Code	Positive / Negative	Description	Survey	Scenario
River Type	n/a	n/a	Overdeep?	No	No
	n/a		River Type	H	H
	n/a		River Category	Other	Other
	A1		Braiding Index	1	1
	A2		Sinuosity Index	1.41	1.41
	A3		Anabranching Index	1	1
	A4		Level of Confinement	Unconfined	Unconfined
	A5		Reach Valley Gradient	0.0012	0.0012
	A6		Bedrock Reach?	No	No
	A7		Coarsest Bed Material	Gravel-Pebble	Gravel-Pebble
	A8		Average Bed Material	Sand	Sand
Bank Top	B1	+	Bank Top Vegetation Structure	3	3
	B2	+	Bank Top Tree Feature Richness	4	4
	B3	+	Bank Top Water-Related Features	0	0
	B4	-	Bank Top NNIPS Cover	-1	-1
	B5	-	Bank Top Managed Ground Cover	-3	-3
Bank Face	C1	+	Bank Face Riparian Vegetation Structure	4	4
	C2	+	Bank Face Tree Feature Richness	4	4
	C3	+	Bank Face Natural Bank Profile Extent	1	1
	C4	+	Bank Face Natural Bank Profile Richness	4	4
	C5	+	Bank Face Natural Bank Material Richness	2	2
	C6	+	Bank Face Bare Sediment Extent	3	3
	C7	-	Bank Face Artificial Bank Profile Extent	-3	-3
	C8	-	Bank Face Reinforcement Extent	-4	-4
	C9	-	Bank Face Reinforcement Material Severity	-3	-3
	C10	-	Bank Face NNIPS Cover	-4	-2
Channel Margin	D1	+	Channel Margin Aquatic Vegetation Extent	2	2
	D2	+	Channel Margin Aquatic Morphotype Richness	3	3
	D3	+	Channel Margin Physical Feature Extent	2	2
	D4	+	Channel Margin Physical Feature Richness	4	4
	D5	-	Channel Margin Artificial Features	-2	-2
Channel Bed	E1	+	Channel Aquatic Morphotype Richness	3	3
	E2	+	Channel Bed Tree Features Richness	2	2
	E3	+	Channel Bed Hydraulic Features Richness	2	2
	E4	+	Channel Bed Natural Features Extent	1	1
	E5	+	Channel Bed Natural Features Richness	1	1
	E6	+	Channel Bed Material Richness	3	3
	E7	-	Channel Bed Siltation	-3	-3
	E8	-	Channel Bed Reinforcement Extent	0	0
	E9	-	Channel Bed Reinforcement Severity	0	0
	E10	-	Channel Bed Artificial Features Severity	-1	-1
	E11	-	Channel Bed NNIPS Extent	-3	-1
	E12	-	Channel Bed Filamentous Algae Extent	-2	-2
			Average Positive Indicators	**2.53**	**2.53**
			Average Negative Indicators	**-2.23**	**-1.92**
			Condition Score (Preliminary)	**0.30**	**0.60**
			Condition Score (Final)	**2**	**2**
			Condition Class (Final)	**Fairly Poor**	**Moderate**

Table 8.2: River Condition Assessment with Impact of Invasive Species Eradication Highlighted

Appendix 1

Biodiversity Metric 3.1. Calculation, Orchard Lane, East Molesey