PRICKLEDEN MILLS, HOLMFIRTH, WEST YORKSHIRE

Biodiversity Net Gain and River Condition Assessment

June 2023

Collingtonwinter
environmental

Report Control Sheet

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1 INTRODUCTION

1.1 SCOPE & PURPOSE

1.1.1. Collington Winter Environmental Ltd was commissioned by Eliston Homes Ltd to prepare a Biodiversity Net Gain (BNG) and River Condition Assessment (RCA) for the proposed development at Prickleden Mills, Holmfirth, West Yorkshire. The site is the subject of a full planning application for the development of three residential apartment buildings and underground car park, with associated soft landscaping, facilitated by partial site clearance. A total of three bridges, comprising two pedestrian and one vehicular bridge is also proposed to be constructed across the river to facilitate access.

1.1.2. Land would be required both temporarily and permanently to construct, operate and maintain the proposed scheme. Permanent land-take requirements include the footprint of all the proposed highway and pedestrian infrastructure and associated earthworks, drainage works and access roads, together with environmental mitigation areas such as landscape planting and biodiversity habitat creation.

1.1.2. The author of this report is Genevieve Labram Msc BSc (Hons), Senior Ecologist with Collington Winter Environmental Ltd, who is qualified in River Condition Assessments and Biodiversity Net Gain. This report has been reviewed Olivia Collington BSc (Hons), MIEnvSc, CEnv, Director at Collington Winter Environmental Ltd. Olivia is highly experienced managing schemes and has produced many ecological reports to inform planning management plans.

1.1.3. This report has been written broadly following the Biodiversity Net Gain Report and Audit Templates (CIEEM, 2021) in order to ensure compliance with the National Planning Policy Framework (2021) regarding no net-loss of biodiversity for the proposed.

1.1.4. The site has been previously subject to ecological surveys in 2021 by Brindle and Green (Ecological Impact Assessment, August 2021; Biodiversity Impact Assessment for Net Gain, December 2021). Updated surveys are to be conducted by Collington Winter Environmental Ltd in 2023. Data from both survey sets will be used to inform this report as appropriate to the time of writing.

1.2. LOCATION

1.2.1. Please refer to Figure 1.1 for the site location. The application site is approximately 1.2 hectares in extent and situated within a shallow valley, at the southern edge of Holmfirth, directly south of the A6024. Residential development is present immediately to the north, east and west. The wider environment to the south comprises arable and pastoral farmland interspersed with connecting hedgerows and treelines leading to woodland further south.

Figure 1.1 Site Location- Site shown by red line boundary.

1.3. OBJECTIVES

1.3.1. The purpose of this assessment is to quantify the change in the biodiversity value of the site prior to development, and the predicted value post development, with the objective of achieving a net gain in biodiversity. The ecological value of the site is expressed as a percentage change in total Biodiversity Units following the completion of the proposed development.

1.3.2. The report has been produced to document the methods, results and conclusions of a BNG Assessment undertaken based on the proposed development for the site to fulfil the following:

- Ensure that the mitigation hierarchy has been applied;
- Identify the baseline habitats present and provide a condition assessment;
- Identify the post development habitats on site, assess the possible target condition and provide an indication of the likely importance of those habitats;
- Calculate the overall change in biodiversity score from pre- post development
- Provide design recommendations to maximise potential net gain achievable
- Provide an indication of likely outcomes and indicative cost as required.

1.4. PLANNING CONTEXT

1.4.1. Paragraph 174(d) of the revised National Planning Policy Framework (2021) states that "Planning polices, and decisions should contribute to and enhance the natural and local environment by… minimising impacts on and providing net gains for biodiversity…"

1.4.2. The Government 25-year Environment Plan states that government will "embed environmental net gain principle for development."

1.4.3. Kirklees Council Local Plan Policy LP30 sets out that "*development proposals should provide biodiversity net gains through good design including specific habitat creation and biodiversity enhancements*". The Biodiversity Net Gain Technical Note (Kirklees Council, June 2021) states that "*within Kirklees, development inside the scope*

of this guidance will be expected to deliver a measurable net gain. At this time, in the absence of legislation, a minimum of 10% net gain in biodiversity is required."

2 METHODS

2.1 THE BIODIVERSITY METRIC 4.0

2.1.1. The BNG calculation was undertaken utilising The Biodiversity Metric 4.0 from DEFRA, the site's UK HAB Plan and the provided Layout Plan (2659 ACU_(100)010D PROPOSED SITE BLOCK PLAN). The calculation was performed by a technically competent and experienced ecologist as detailed in British Standard BS8683 – Suitably qualified person –definition in BS8683:2020.

2.1.2. The Biodiversity Metric 4.0 uses habitat features as a proxy measure for capturing the value and importance of nature. The matric takes into account the size, ecological condition, location and proximity to nearby 'connecting' features. The metric enables assessments to be made of the present and forecast future biodiversity value of a site.

2.2 HABITAT SCORING

2.2.1. The Biodiversity Metric 4.0 supplies reference documents and user guides in which to accurately evaluate and assess the different habitats on site. The methodology for the baseline and post development calculations are demonstrated in the following sections.

Baseline Units

2.2.2. To assess the quality of a habitat and therefore calculate the units scored the Biodiversity Metric 4.0 utilises three scoring factors as detailed below.

Condition

2.2.3. The condition of a habitat is assessed utilising the Condition Sheets provided for each habitat type. These list positive indicators for each habitat and indicate how many of these indicators need to be present to meet certain thresholds of condition. These condition sheets can be found in the Biodiversity Metric 4.0 habitat condition assessment sheets with instructions tool Technical (Natural England Joint Publication, 2021).

Distinctiveness

2.2.4. The distinctiveness of each habitat (area and linear) is automatically assigned by the tool, based upon national records of the occurrence and rarity of each habitat (Biodiversity Metric 4.0).

Strategic Significance

2.2.5. The idea of strategic significance works at a landscape scale. It gives additional unit value to habitats that are in preferred locations for biodiversity and other environmental objectives. Strategic significance utilises published local plans and objectives to identify local priorities for targeting biodiversity and nature improvement, such Nature Recovery Areas, local biodiversity plans, National Character Area objectives and green infrastructure strategies. The site has been considered to be within "Location ecologically desirable but not in local strategy".

Post Development Units

2.2.6. Additional factors are implemented when assessing post development habitats.

- Difficulty of Creation/Enhancement
- Temporal Risk "Time to target condition"
- Spatial Risk (when offsite mitigation is necessary)

2.3 EXISTING AREA HABITAT (BASELINE)

2.3.1. An updated site walkover was undertaken by Collington Winter Environmental Ltd in May 2023.

2.3.2. Habitat types were converted to UKHab classifications (The UK Habitat Classification Working Group, May 2018) using the UK Habitat Classification V1 guidance tool based on the assessor's judgment of how JNCC habitat descriptions best meet the criteria of the UK habitat classification. The methods were based on the standard methodology as detailed by UK Hab Methodology to assess the habitats present. A Habitat Plan was produced on QGIS to accurately measure the area of each habitat.

2.3.3. The areas of identified habitats is calculated in hectares (ha), ignoring linear features such as hedgerows or ditches (the area should be measured to the centre line of such features). The length of linear features such as hedgerows and rivers are measured separately in km.

2.3.4. Biodiversity units for all "area" habitats were then calculated using the The Biodiversity Metric 4.0 from DEFRA (full calculation available in Appendix), according to the habitats present and their size, distinctiveness and condition.

2.4. EXISTING RIVER HABITAT (BASELINE)

River Condition Assessment (RCA)

2.4.1. The condition of rivers is assessed using the MoRPh method (Cartographer, 2023). The survey assessed conditions along the bank tops (10m back from the bank face), the bank face and the channel bed. Figure 1 (Please see Appendix) shows where MoRPh surveys were undertaken.

2.4.2. The condition assessment for rivers is split into two sections; Desk Study and Field Survey. Each section uses a series of criteria to generate two outcomes an Indicative River Type (in the case of the Desk Study) and a Provisional Condition Score (in the case of the Field Survey).

Desk Study

2.4.3. The MoRPh desk study is conducted of a wider reach of the river channel to determine the river type based on available satellite data and maps. The wider reach was defined by significant changes in the channel, for example:

- A major tributary (e.g. contributing >10% flow to the receiving watercourse)
- A major artificial barrier (e.g. >5m tall, likely to significantly change flow or sediment movement)
- A distinct and persistent change in planform (e.g. change from meandering to straight).

2.4.4. Eight river type indicators are assessed based the on the desk study information, these are combined to determine Indicative River Type. Five indicators are assessed by desk study (A1 -A5) while three are automatically estimated from the field survey data (A6 -A8). These eight indicators are summarised in **Table 1** in the appendix.

2.4.5. For rivers and streams, 'high' strategic significance has been applied to watercourses within local, regional or national strategies or plans, including:

- Local Plans
- River Basin Management Plans
- Catchment Plans
- Catchment Planning System
- Priority Habitats for Restoration

Field Survey

2.4.6. A MoRPh survey is used to collect information in the field for subreach(es) of a river. The aim of the MoRPh survey is to survey at least 20 % of the total river length within the site. The surveys assessment information on short lengths (or modules) of a river that are approximately twice the river width.

2.4.7. A subreach survey is comprised of five contiguous MoRPh module surveys to gather information for subreaches 50, 100, 150 and 200 m in length (250 m for canals, navigable and large rivers) according to the width of the river. MoRPh surveys included the river and all habitat within a radius of 10 m.

2.4.8. A Provisional Condition Score is assessed using 32 condition indicators, split between four morphological features (Bank Top, Bank Face, Channel- Water Margin and Channel Bed). Each river condition indicator is assigned a score of 0 to +4 (positive indicators) or 0 to -4 (negative indicators). These 32 condition indicators are listed **in Table 2**- within the Appendix- with all negative indicators listed in red.

2.4.9. The Preliminary Condition Score for each MoRPh subreach is calculated as the sum of the average positive condition indicator scores and the average of the negative condition indicator scores. A Final Condition Score is then assigned in accordance with the river type under assessment.

2.4.10. Final Condition scores in the River Condition Section of the DEFRA 2.0 Metric are as follows:

- Good: 5
- Fairly Good: 4
- Moderate: 3
- Fairly Poor: 2
- Poor: 1

2.4.11. The output condition score is then entered into the Biodiversity Metric.

Encroachment

2.4.12. The level of encroachment (presence of buildings, farming or hardstanding within 10m of the bank edge) is assessed on the banksides. Encroachment is a negative factor to the overall river condition. There are two types of encroachment in the rivers and streams metric:

- In-watercourse encroachment has been assigned using the guidance in Table 3 (See the Appendix)
- Riparian encroachment has been assigned using the guidance in Table 4 (See the Appendix)

2.4 LIMITATIONS OF ASSESSMENT

2.3.1 Whilst every effort has been made to provide a comprehensive description of the site, no investigation could ensure the complete characterisation and prediction of the natural environment. The conclusions and recommendations detailed in this report are based upon the site redline boundary and the development proposals as outlined by the client at the time of writing. Should there be any changes to the site redline boundary or development proposals at a later stage, this assessment should be reviewed to determine whether any amendments or additional survey work is required.

2.3.1 Habitat areas (predevelopment) have been measured using online mapping, and therefore will not be completely accurate.

2.3.1 The proposed habitat baseline is calculated using both the landscaping plans and professional opinion on the target conditions that can be attained for each habitat type with proficient management. Therefore, all proposed habitat types rely on implementation of a long-term management plan and planting in line with the provided landscape proposals. Further information on this is provided in the conclusion.

2.3.1 The Site Layout Plan used for post development areas is indicative in nature and does not constitute a detailed landscape plan.

2.3.1 River Condition Assessment are taken from the accessible bankside. Therefore, some elements such as soil substrate and bank profile may not always be visible and is based on a surveyors professional judgment.

2.3.1 Many rivers have also been previously assessed under individual Water Framework Directive Regulations (WFD Regulations). In this instance, it has been assumed that restoration or enhancements to channel morphology will follow these requirements where applicable.

3 BASELINE CONDITIONS

3.1. CONDITION ASSESSMENT – AREA HABITATS

3.1.1. The following section summarises the condition assessment based on the condition sheets present within the Biodiversity Metric 4.0.

Developed Land; Sealed Surface

3.1.2. Concrete hardstanding extended from the eastern boundary into the centre of site providing access to the northern half of the site. Across the river, on the southern section of the site, a further area of hardstanding is present, some of which looked to be recently covered in crushed rubble. In total, an area covering 0.3267ha of land is currently covered by sealed hardstanding, or buildings.

3.1.3. The habitat condition assessment is pre-set to "N/A- Other".

Lakes; Ornamental Lake or Pond

3.1.4. A large pond is present to the western end of the site, connected to the River Holme, covering an area of 0.2345ha.

3.1.5. The habitat condition assessment has been calculated as "Poor" as it only fulfils 5 out of 9 non-woodland pond criteria:

- The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.
- Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.
- There is an absence of listed non-native plant and animal species.
- The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.
- The pond surface is no more than 50% shaded by adjacent trees and scrub.

Grassland: Other Neutral Grassland

3.1.6. A grassland track covering an area of approximately 0.06ha is present around the southern perimeter of the pond- and heavily grazed in places by geese.

3.1.7. Species recorded here include Perennial rye grass (*Lolium perenne*), greater willowherb (*Epilobium hirsutum*), bracken (*Pteridium aquilinum*), bramble (*Rubus fruticosus agg*), ash saplings (Ash *Fraxinus excelsior*), soft rush (*Juncus effususis*), foxglove (Digitalis sp.,), common nettle (*Urtica dioica*), common hogweed *(Heracleum sphondylium*), ragwort (*Jacobaea vulgaris*) and herb Robert (*Geranium robertianum*). The habitat meets three of the required condition assessments for the habitat as detailed below, and therefore was found to be in "Moderate" habitat condition:

- Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
- Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.
- Cover of bracken *(Pteridium aquilinum)* is less than 20% and cover of scrub (including bramble) is less than 5%.

Urban: Open Mosaic on Previously Developed Land

3.1.8. Following clearance works, the majority of the site was previously assessed in 2021 as supporting "ephemeral short perennials". However, this vegetation has now established, and been classed as "open mosaic on previously developed land". Species recorded included common nettle, bramble, rosebay willowherb, foxglove, perennial rye grass, bitter dock (*Rumex obtusifolius*), scotch broom (*Cytisus scoparius*), cocks foot (*Dactylis glomerata*), colts foot (*Tussilago farfara*), thistle, sorrel (*Rumex acetos*a), butterfly bush, red valerian (*Centranthus ruber*), goat willow (*Salix caprea*), white stonescrop (*Sedum album*), common mullein (*Verbascum thaps*us) and lady's mantle (*Alchemilla vulgaris*).

3.1.9. This habitat covers 0.2846ha and was found to be in a "Moderate" habitat condition based on meeting two of the required criteria, plus additional Criteria D1 as below:

- Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation type does not account for more than 80% of the total habitat area.
- The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.
- Invasive non-native plant species (listed on Schedule 9 of WCA[1]) and others which are to the detriment of native wildlife (using professional judgement)[2] cover less than 5% of the total vegetated area[3].

- **(Additional Criteria)** The parcel shows spatial variation and forms a mosaic of at least four early successional communities (a) to (h) PLUS bare substrate. (a) annuals; (b) mosses/liverworts; (c) lichens; (d) ruderals; (e) inundation species; (f) open grassland; (g) flower-rich grassland; (h) heathland.

Trees: Broadleaved Woodland

3.1.10. Scattered broadleaved trees are comprise located along the area of land between the pond and the river, and on the southern boundary, forming a narrow woodland strip. Tree ages varied from immature to mature, and comprised of frequent Ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), oak (*Quercus robur*), and crack willow (*Salix fragilis*), with occasional alder (*Alder glutinosa*), hawthorn (*Crataegus laevigata*) and horse chestnut (*Aesculus hippocastanum*). All trees are due to be retained on site.

3.1.11. The woodland represents a total area of 0.0737ha, scored a "Poor" habitat condition based on scoring less than 26 points out of the available 39.

3.1.12. A further area of trees recorded a an "ecologically valuable line of trees" in "Moderate" condition is present on the western part of the site around the river. These trees are to be retained and provide an additional 0.62 habitat units.

Heathland and shrub- Mixed scrub

3.1.13. Small areas of bankside riparian and scrub areas are present around the river and pond edge. These habitats have been classed as "Mixed scrub" as there is no closer matching habitat type. Species recorded here include bramble, greater willowherb, alder saplings and soft rush.

3.1.14. Small amounts of Japanese Knotweed (*Fallopia japonica*) were noted along the River Holme to the eastern end of the site.

3.1.15. These riparian banksides represent a total of 0.0292ha, and were assessed as "Poor" habitat condition, fulfilling a single criterion:

- The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.

Running Water

3.1.16. The River Holme flows through the site for a distance of approximately 0.23km, and with a footprint (including culverts and artificial re-enforcement) of 0.2125ha from the east to north-west.

3.1.17. At the time of survey, the river was approximately 0.5m in depth and fast flowing within the section of the river within the redline boundary. The river supports earth, and clay banks in sections, with much of the river bank artificially re-enforced with brick. The average coarseness of the river substrate was "cobbles" and a small weir is present across one section. This weir was not considered substantial enough to impact species dispersal but has been recommended for removal as part of enhancements to the river (further details provided in section 3.2. below).

3.1.18. The river has been assessed as part of a River Condition Assessment and was found to be in "Moderate" condition, with a high level of encroachment on all sides.

3.1.19. This assessment is supported by a Water Framework Assessment undertaken in 2015, which states the River Holme has *"moderate" ecological potential for this waterbody. The classification appears to be driven mainly by "moderate" status for fish ("good" in 2009 assessment), "moderate" status for invertebrates ("moderate" in 2009) and "moderate" status for phosphate ("good" in 2009 assessment).".*

3.1.20. Sections of river and its associated banks totalling 20m will be lost following the creation of the proposed bridges.

3.2. RETAINED AND ENHANCED HABITATS

Woodland and Scattered trees

3.2.1. All semi-mature and mature trees are to be retained and enhanced through the development through the following management practices to target a "Moderate" habitat condition:

- Deadwood will be placed into deadwood piles to improve availability of niches for insects.
- Selective canopy thinning to increase light.
- Thinning of scrub and undesirable vegetation in the understorey.
- Removal of invasive plant species.
- Supplementary planting with native whips.
- Encourage the presence of standing deadwood.

Ornamental Pond Enhancements

3.2.2. The pond is due to be enhanced through increased native planting and a reduction in the water level by approximately 600mm to facilitate seasonal water level fluctuations. Planting would include the provision of "Emergent, submerged or floating plants (excluding duckweed) cover at least 50% of the pond area which is less than 3 m deep."

3.2.3. This would achieve an additional criterion and increase the condition of the pond to "Moderate".

Grassland: Other Neutral Grassland Enhancements

3.2.4. Retained grassland around the pond at the west of the site could then be overseeded with a native wildflower mix such as Emorsgate EM8 Seasonal Wetland Mix, and areas of excessive willowherb should be controlled to maintain this habitat at a "Moderate" level.

Grassland: Riparian Enhancements

3.2.5. An area of riparian vegetation including small willow scrub and soft rush, is present on the northern pond boundary. This area of riparian vegetation could be extended into the pond with floated pre-seeded coir mats and floating vegetated platforms, providing additional planting and expanding the depth of the riparian margin (examples of this available at: https://wetland-plants.co.uk/shop/water-garden-accessories/pre-planted-coir-rolls/). Installation should follow the manufacturer's instructions.

River

3.2.6. There is no new river habitat proposed for creation nor is there any proposed significant loss of river habitat as a result of the development proposals. Proposed crossings do not result in any change in the river condition as the proposed is not wide enough to result in significant shading and the watercourse is already culverted for much of its length. In addition, the implementation of enhancements to the river habitat are not considered to increase the habitat's condition beyond its current level (moderate). The development proposals will therefore result in no significant change to the number of river units within the site.

3.2.7. An area of river approximately 0.09km long will be enhanced with the removal of the weir, and provision of "softer" channel re-enforcements in place of the concrete culverts that extend significantly into the watercourse. The provision of gabions and "rickrack" would provide areas of marginal backwater, with a corresponding slower flow, and allow for siltation, and establishment of plants and improved riparian habitats. Gaps between boulders would also allow for safe foraging and feeding locations for fish fry and prey.

3.2.8. The proposed plans show this area to be unplanted on the upper banks- providing scope to enhance the river bank and surrounds with further areas of wildflower meadow and area of riparian and semi-emergent vegetation which would improve the rivers suitability for insects, and aquatic mammals.

3.2.9. As the river is largely constrained, and re-enforced at the north-eastern end of the site, it is acknowledged that opportunities for enhancement are limited.

3.3. LOST HABITATS

3.3.1. All other habitats within the red line boundary are to be lost to development.

3.4. PRE- DEVELOPMENT HABITAT BASELINE

3.4.1. Please refer to Table 3.1 and Table 3.2 summarising the Habitat and River Baseline for the calculation, demonstrating habitats to be retained, enhance and/or lost.

Table 3.1 Habitat Baseline Units

	On site Baseline	Retained	Enhanced	Lost
Habitat (Area) Units	*5.09*	*0*	*1.14*	*3.95*

Table 3.2 Linear Baseline Units

	On site Baseline	Retained	Enhanced	Lost
River Units	*1.04*	*0.54*	*0.41*	*0.09*
Linear units (hedge)	*0.62*	*0.62*	*0*	*0*

4 HABITAT CREATION

4.1. INTRODUCTION

4.1.1. All habitat creations listed below are to take place within the site boundary. The following sections detail the condition assessments that the habitats will be required to meet in order to achieve their target condition. This can be achieved through the production of a Landscape Environmental Management Plan with a minimum 30-year management period.

4.2. URBAN – DEVELOPED LAND: SEALED SURFACE

4.2.1. An area covering 0.5225ha ha will be comprised of hardstanding and buildings, making up a sealed surface. This habitat type has a pre-set target condition of "N/A – Other".

4.3. GRASSLAND – MODIFIED GRASSLAND

4.3.1. A total area of 0.1163 ha will be covered by new modified grassland around the communal areas and should be planted Emorsgate El1 Flowering Lawn Mix (or similar as available). This is expected to be regularly maintained, and therefore, has been given an anticipated condition of "Poor". To achieve this habitat condition, management must seek to achieve the following condition criteria:

- Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.
- Cover of bracken Pteridium aquilinum is less than 20% and cover of scrub (including bramble) is less than 5%.
- Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens1.

4.4. GRASSLAND – OTHER NEUTRAL GRASSLAND

4.4.1. A small area of grassland (0.0398 ha) around the proposed pathway near the pond will be a shade tolerant mix to be used. This mix will be a mixture of wildflower and grasses to be proposed by the Landscape Designer. The species mix should have at least 9-12 species per m^2 and be sown as per manufacturers instructions. The neutral grassland will target a "Moderate" habitat condition and seek to achieve the following condition criteria:

- Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
- Cover of bracken Pteridium aquilinum is less than 20% and cover of scrub (including bramble) is less than 5%.
- Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.

4.5. HEATHLAND AND SCRUB – MIXED SCRUB "RIPARIAN"

4.5.1. A total area of 0.1127 ha of riparian scrub habitat will be created along the banks of the River Holme. The habitat definition of Scrub has been used here to be most effective. However riparian vegetation not included in the scrub definition should be encourage and planted with Emorsgate EP1F Pond Edge Mixture (or similar as available) along the edges of the pond. Excessive bramble cover should be controlled, and any invasive species removed.

4.6. URBAN – URBAN TREE

4.6.1. A total of 21 new medium sized trees and 15 small sized trees are proposed within the scheme. These have been classed as "urban" rather than rural trees. These are set to target a Moderate" habitat condition and cover 0.06718 ha. They will target the following condition criteria to achieve the target condition:

- The tree is a native species (or more than 70% within the block are native species).
- There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime so the trees retain >75% of expected canopy for their age range and height.
- Micro-habitats for birds, mammals and insects are present e.g. presence of deadwood, cavities, ivy or loose bark

4.7. HEDGEROW: NATIVE HEDGEROW

4.7.1. New introduced shrub planting is proposed around modified grassland planting. It is recommended that at least 50% of this is comprised of native species These are set to target a Moderate" habitat condition and cover 0.37 habitat units. They will target the following condition criteria to achieve the target condition

- Gaps to make up <10% of total planted area;
- >90% of the hedgerow/shrub area is free of damage caused by human activities;
- Ensure the satisfactory establishment and growth of new planting typical of the respective species;
- Promote conditions so that it is healthy and safe; and
- Ensure continuity of the design approach and amenity value of the planting.

Table 4.1 Habitat Type and Condition Assessment (post- development)

HABITAT TYPE	CONDITION ASSESSMENT	AREA SIZE (ha)
Urban – Developed Land; Sealed Surface	N/A - Other	0.5225
Grassland – Modified Grassland	Poor	0.1163
Heathland and Shrub – Mixed Scrub	Moderate	0.0127
Urban – Urban Tree (combined sizes)	Moderate	0.8306
Grassland – Other Neutral Grassland	Moderate	0.0398

5 SUMMARY

5.1.1. This report and the DEFRA 4.0 Metric submitted have demonstrated that the proposed habitat creation and enhancements create a net loss of biodiversity within the site of -6.30% in habitat units, and a net gain in linear features of +59.77% and a net gain in river habitat units of +0.42%. The trading rules have not been satisfied due to the loss of high distinctiveness "open mosaic on previously developed land".

5.1.2. It is recommended that the scheme purchase credits or find off-site habitats within its ownership that could be subject to "off-site" habitat enhancement or creation.

5.1.3. Once net gain is established, it is recommended that a Landscape Ecological Management Plan (LEMP) be conditioned as part of the planning permission to meeting the targeted conditions of post development habitats. The LEMP will detail full management prescriptions for all habitats to be retained and created within the site, for the 30-year period required as best practice for biodiversity net gain.

Prickleden Mill

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On-site baseline	Habitat units	5.09		
	Hedgerow units	0.62		
	Watercourse units	1.04		
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	4.77		
	Hedgerow units	0.98		
	Watercourse units	1.04		
On-site net change (units & percentage)	Habitat units	-0.32	-6.30%	On-site net gain is less than target set ⚠
	Hedgerow units	0.37	59.77%	
	Watercourse units	0.00	0.42%	On-site net gain is less than target set ⚠
Off-site baseline	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site net change (units & percentage)	Habitat units	0.00	0.00%	
	Hedgerow units	0.00	0.00%	
	Watercourse units	0.00	0.00%	
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-0.32		
	Hedgerow units	0.37		
	Watercourse units	0.00		
Spatial risk multiplier (SRM) deductions	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-0.32	
	Hedgerow units	0.37	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-6.30%	Total net gain achieved is less than target set ⚠
	Hedgerow units	59.77%	
	Watercourse units	0.42%	Total net gain achieved is less than target set ⚠
Trading rules satisfied?	No - Check Trading Summaries ▲		

Figure 5.1- Prickleden Mills BNG results.

6 BIBLIOGRAPHY

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- Natural England (2019). Lake Naturalness Assessment Guidance

7 APPENDIX

Table 1: River Type Indicators

Survey Type	River type Code	Feature
Desk Study	A1	Braiding Index
Desk Study	A2	Sinuosity Index
Desk Study	A3	Anabranching Index
Desk Study	A4	Level of Confinement
Desk Study	A5	Valley Gradient
Field Study	A6	Bedrock Reaches
Field Study	A7	Coarsest bed Material size Class
Field Study	A8	Average alluvial bed material size class

Table 2: River Condition indicators

Location Code	Condition	Description
Bank Top	B1	Vegetation Structure
	B2	Tree Feature
	B3	Water Related Features
	B4	NNPS Cover
	B5	Managed Ground Cover
Bank Face	C1	Riparian Vegetation Structure
	C2	Tree Feature
	C3	Natural Bank Profile Extent
	C4	Natural Bank Profile Richness
	C5	Natural Bank Material Richness
	C6	Bare Sediment Extent
	C7	Artificial Bank Profile Extent
	C8	Reinforcement Extent
	C9	Reinforcement Material Severity
	C10	NNPS Cover
Channel – Water Margin	D1	Aquatic Vegetation Extent
	D2	Aquatic Morphotype
	D3	Physical Feature Extent

	D4	Physical Feature Richness
	D5	Artificial Features
Channel Bed	E1	Aquatic Morphotype Richness
	E2	Tree Features Richness
	E3	Hydraulic Features Richness
	E4	Natural Features Extent
	E5	Natural Features Richness
	E6	Material Richness
	E7	Siltation
	E8	Reinforcement Extent
	E9	Reinforcement Severity
	E10	Artificial Features Severity
	E11	NNPS Extent
	E12	Filamentous Algae Extent

Table 3: In-watercourse Encroachment bands

In-watercourse Encroachment Band	Multiplier	Description	Examples
No encroachment	1.0	<%5 Bank length compromising an engineered bank revetment and no encroachment to the watercourse	-
Minor	0.8	5-20% of bank length comprising engineered revetment or encroachment up to 10% of the river width.	Small Headwalls
Major	0.5	>20% of the bank length comprising engineered revetment or encroachment >10% of the channel width	Weirs large headwalls, bank revetments

Table 4: Riparian encroachment bands

Riparian Encroachment Band	Multiplier	Description
No encroachment	1.0	No Development within 10m of the Banktop
Minor	0.95	Any Development 8-10m from the bank top (up to 100% of the area) or where the development footprint occupies 10% of the riparian zone within 4-10 of the bank top.
Major	0.75	Any Development 0-4m from the bank top or where the development footprint occupies >25% of the total riparian zone.

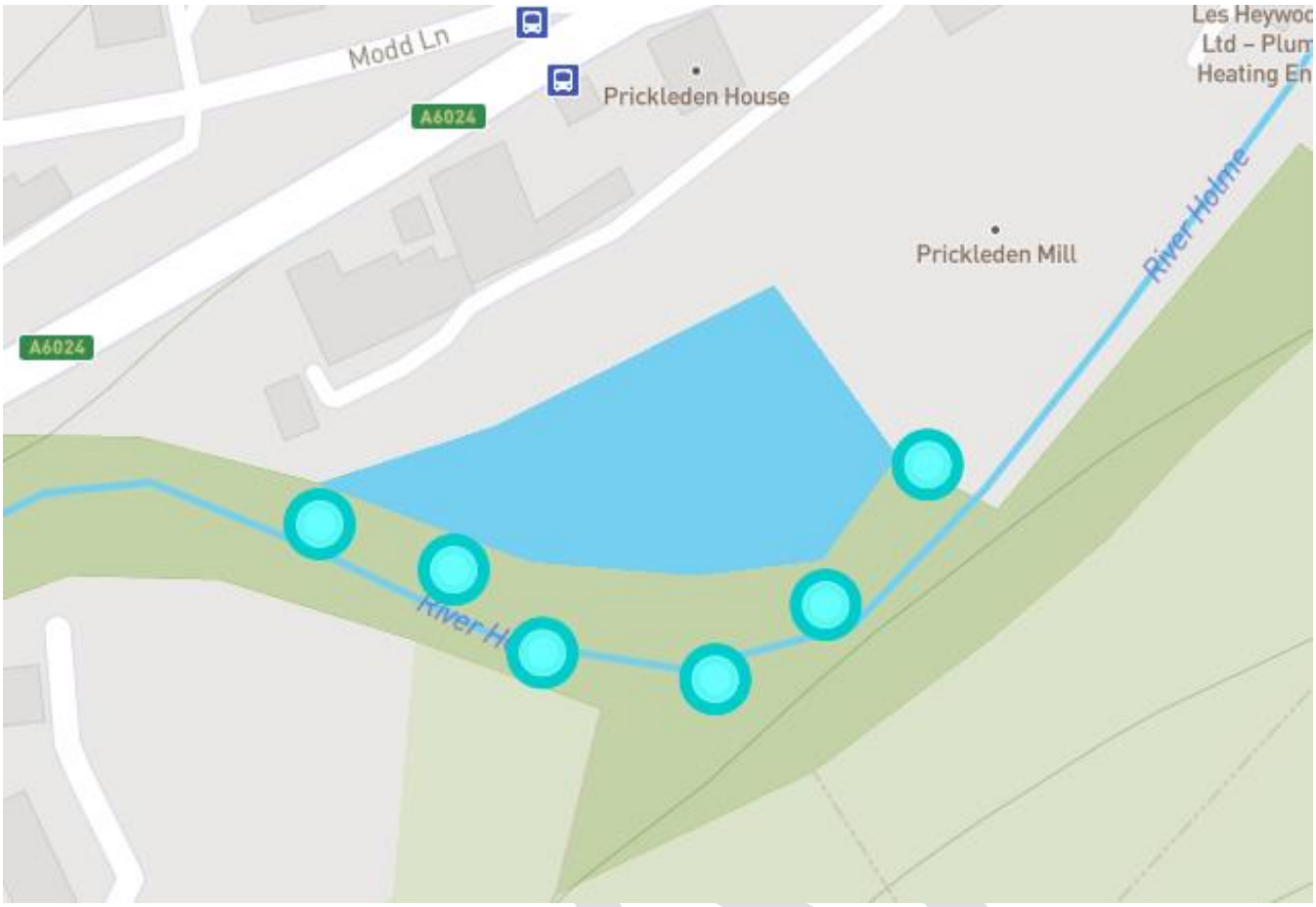

Figure 2: Approximate location of RCA assessment points. Six data sets were collected in total.

SITE PHOTOS

Image 1: Overview of the site looking north-east. Showing the establishment of vegetation onsite

Image 2: Areas of hardstanding within the site

Image 3: View of the pond looking north-east

Image 4: Upstream section (Morph 1) of River Assessed from left bank

Image 5: Downstream section (Morph 6) of river assessed from left bank

Image 6: Weir to be removed as part of river enhancements

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