



Redrow Homes Ltd

**Land South of Burbage**

## **BIODIVERSITY NET GAIN REPORT**

November 2023

**FPCR Environment and Design Ltd**

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## 1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Ltd (FPCR) on behalf of Redrow. It details the results of a Biodiversity Net Gain assessment undertaken at Land South of Burbage (hereafter referred to as the 'site').
- 1.2 The site was subject to a suite of ecological survey work in 2020 and 2021, with an update habitat survey undertaken in 2023 to inform the planning application. The survey work undertaken included a Phase 1 habitat survey of the site in November 2020, an update Phase 1 survey and habitat condition assessment in August 2021 and an update habitat/condition survey in January 2023. The results of the survey work undertaken are set out within the FPCR report 'Land Sout of Burbage: Ecological Appraisal' dated November 2023.

## 2.0 METHODOLOGY

- 2.1 Biodiversity Net Gain (BNG) assessment was initially calculated using the DEFRA Biodiversity Metric 3.1 and associated User Guide and Technical Supplement<sup>1</sup>. Since the time of the survey Defra have published a new version of the metric Defra ver.4.0. It should be noted that the published criteria for version 4.0 are broadly the same as those of version 3.1, with no difference in the habitat condition criteria. As such, this is not seen as a constraint to the assessment.
- 2.2 The BNG assessment was updated in accordance with the Defra BM4.0 Metric and associated User Guide and Technical Supplement<sup>2</sup>.

### Area Habitats and Linear Hedgerow Habitats

- 2.3 Loss of habitats and new land use were calculated using the Landscape Masterplan (ref: c-2109-01 and 02 Rev A, PDP Associates).
- 2.4 The Biodiversity Metric 4.0 calculator tool utilises the UK Habitat Classification System (UKHab) as the standard data input for habitats. Enough data was recorded during the Phase 1 habitat survey and condition assessments in order to classify most of the habitats within UKHab.

### River Condition Assessment

- 2.5 River Condition Assessment survey was undertaken on the watercourse within the site by an ecologist accredited in conducting MoRPh field surveys, River Type desk studies and recording data using the RCA information system (Cartographer) in August 2021. The survey was undertaken in-line with the MoRPh survey guidelines, comprising 5x continuous 10m MoRPH sections (based on watercourse width). Surveys were undertaken from the right bank, working downstream.

### Metric Calculations

- 2.6 Each existing habitat or linear feature recorded within the site was assigned a score for 'Distinctiveness', 'Condition' and 'Strategic Significance'.

<sup>1</sup> Natural England (2022) The Biodiversity Metric 3.1 (JP039) [Online]. Available from: <http://publications.naturalengland.org.uk/publication/6049804846366720> [Accessed 01/06/23]

<sup>2</sup> Natural England (2023) Biodiversity Metric 4.0 – User Guide. [online] Available at: <https://publications.naturalengland.org.uk/publication/6049804846366720> [Accessed 17/11/23]

- 2.7 The value of each habitat parcel (or linear feature) is measured in 'Biodiversity Units' a proxy measure for biodiversity calculated by the habitat attributes detailed above. Biodiversity Unit values for area-based habitats and hedgerows are calculated separately and are not interchangeable.

### **Limitations And Assumptions**

- 2.8 There are considered to be no significant limitations on the data collected to inform this BNG assessment. The relevant methodologies and guidance documents have been followed wherever relevant. Although the update survey was undertaken outside of the optimal survey period, the habitats and their management had not changed since the survey in April 2021 and therefore were considered to still be representative.

## **3.0 BASELINE HABITATS AND LINEAR FEATURES**

### **Area Habitats**

- 3.1 The baseline habitats within the site are dominated by grazed modified grasslands, with a single other neutral grassland field present in the north-east of the site. In addition, areas of scrub, tall ruderal vegetation, bare ground and a pond are present within the site, along with buildings, hardstanding and garden areas associated with two residential properties in the north of the site and a farmyard in the south.
- 3.2 The overall baseline value of the site is 58.11 habitat units.

### **Modified Grassland**

- 3.3 The modified grassland present across the site comprised short (<5cm) grazed grassland which was dominated by grass species and supporting low forb abundances. All the fields were noted to support less than 6 species per m<sup>2</sup> on average. As such, the modified grassland within the site was assessed as being in poor condition (failing criteria 1, which is non-negotiable for achieving moderate condition).

### **Other Neutral Grassland**

- 3.4 A field comprising other neutral grassland is present to the north-east of the site. This field comprised two distinct areas of grassland which represent poor semi-improved grassland and marshy grassland. Both of these habitat fall under the other neutral grassland habitat type in accordance with the UKhab classification. Neither of these grassland areas are considered to closely match the characteristics of the UKhabitat type due to being species poor and their general species composition.
- 3.5 As such the other neutral grassland within the site was assessed as being in poor condition (failing criteria 1, which is non-negotiable for achieving moderate condition).

### **Scrub**

- 3.6 Areas of bramble *Rubus fruticosus* agg. scrub are present within the site, with bramble scrub given an automated condition score of 1 within the metric.

- 3.7 An area of mixed scrub, comprising bramble, blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna* is present in the north of the site (separating two modified grassland fields). This area of scrub failed four of the five criteria (only passing criteria D: absence of non-native and species indicative of sub-optimal conditions less than 5%) and as such was assessed as being in poor condition.

### Ruderal Vegetation

- 3.8 Small areas of ruderal vegetation on previously disturbed land were present within the site. These largely comprised common nettle and creeping thistle. Due to the lack of species and structural diversity, the areas of tall ruderal vegetation were assessed as being in poor condition (as per the Urban Habitat condition criteria).

### Pond

- 3.9 Four ponds are present within the site (P4, P7, P21 and P22), of these P21 and P22 comprise ornamental garden ponds, P4 is a widening in a hedgerow ditch and P7 comprised a shaded field pond. Ponds P7 and P21 were both assessed as being in moderate condition as neither had moderate distinctiveness habitats (or above) within 10m or at least 50% cover of emergent, submergent or floating vegetation. In addition, P7 had over 50% shading from wood bankside vegetation whilst P21 did not support good water quality. Pond P22 was assessed as being in poor condition as it was dry at the time of survey, supporting no vegetation, and habitats of moderate distinctiveness habitat were absent within 10m of the pond. P4 was also assessed as being in poor condition due to being located in a ditch, lacking moderate distinctiveness adjacent habitat with 10m, being over shaded and lacking vegetation.

### Buildings, Hardstanding and Gardens

- 3.10 Buildings and hardstanding are automatically given a condition score of 0 within the metric, whilst garden habitat is automatically given a condition score of 1.

### Linear Habitats- Hedgerows

- 3.11 Twenty-seven native hedgerows and a single non-native hedgerow are present within the site / at the site boundaries, along with ornamental non-native hedgerows associated with the gardens in the north of the site.
- 3.12 Ornamental hedges are given an automatic condition value of 1 within the metric. The native trees and treelines within the site were assessed as ranging from poor to good condition, with a summary provided in Table 1 of hedgerow type and conditions.

**Table 1. Hedgerow type and conditions**

| Ref | Type                                                       | Condition |
|-----|------------------------------------------------------------|-----------|
| H1  | Native Hedgerow with trees - Associated with bank or ditch | Good      |
| H2  | Native Hedgerow with trees - Associated with bank or ditch | Good      |
| H3  | Native Hedgerow with trees - Associated with bank or ditch | Good      |
| H4  | Native Hedgerow with trees - Associated with bank or ditch | Good      |
| H5  | Native Hedgerow                                            | Moderate  |
| H6  | Native Hedgerow                                            | Moderate  |
| H7  | Native Hedgerow                                            | Moderate  |

| Ref | Type                                                       | Condition |
|-----|------------------------------------------------------------|-----------|
| H8  | Native Hedgerow with trees - Associated with bank or ditch | Moderate  |
| H9  | Native Hedgerow - Associated with bank or ditch            | Moderate  |
| H10 | Native Hedgerow - Associated with bank or ditch            | Good      |
| H11 | Native Hedgerow - Associated with bank or ditch            | Moderate  |
| H12 | Native Species Rich Hedgerow                               | Moderate  |
| H13 | Native Hedgerow                                            | Moderate  |
| H14 | Native Hedgerow                                            | Moderate  |
| H15 | Native Hedgerow                                            | Moderate  |
| H16 | Native Hedgerow                                            | Moderate  |
| H17 | Native Hedgerow                                            | Moderate  |
| H18 | Native Hedgerow                                            | Moderate  |
| H19 | Native Hedgerow                                            | Moderate  |
| H20 | Native Hedgerow                                            | Moderate  |
| H21 | Native Hedgerow                                            | Moderate  |
| H22 | Native Hedgerow                                            | Moderate  |
| H23 | Native Hedgerow                                            | Moderate  |
| H24 | Native Hedgerow                                            | Poor      |
| H25 | Native Hedgerow with trees                                 | Moderate  |
| H26 | Native Hedgerow                                            | Moderate  |
| H27 | Native Species Rich Hedgerow                               | Moderate  |
| H28 | Native Hedgerow with trees                                 | Moderate  |
| TL1 | Line of Trees                                              | Poor      |
| TL2 | Line of Trees                                              | Moderate  |
| TL3 | Line of Trees                                              | Moderate  |

- 3.13 Overall, the baseline value of the hedgerows on site is 25.42 hedgerow units.

### Watercourse Habitats

- 3.14 A watercourse flows through the site from the western site boundary to the eastern, and then south towards the M69.
- 3.15 The section flowing between, and the western and eastern boundary represents a ditch associated with hedgerows H9 and H10. Small sections of this ditch are culverted. This section of ditch was recorded to be dry during some of the survey work undertaken but supported water in 2023. The ditch failed the majority of the condition criteria, only passing criteria A (water quality), Criteria C (less than 10% filamentous algae or duckweed) and Criteria H (absence of non-native species). Therefore, the ditch section of the watercourse was assessed as being in poor condition.
- 3.16 The more open watercourse section flowing south to the M69 along hedgerow H4 and between grassland fields represents a small brook and is River Type K with a condition score of 1.02, which equates to being in moderate condition. However, the River Shape Index for the brook is 2.5 within the River Condition Assessment and is overdeep and disconnected to its wider floodplain. As such, the condition is reduced by one level to 'fairly poor' as per the guidance.
- 3.17 The brook scored well in terms of bank profile extent and richness and lacking any negative bank profile reinforcements. It also scored well on lack of invasive species along the watercourse and channel re-enforcements.

- 3.18 The brook scored particularly badly however in respect of the presence of managed bank top ground cover, bank top water related features, bank material richness, hydraulic features richness, natural channel feature richness and siltation.
- 3.19 Overall, the baseline value of the watercourses within the site is 3.57 river units.

## **4.0 PROPOSED DEVELOPMENT**

### **Area Habitats**

#### **Retained and Enhanced Habitats**

- 4.1 Where possible, areas of grassland have been retained and will be enhanced, with either a flowering lawn mix to achieve moderate condition modified grassland or with a wildflower seed mix such as Emorsgate EM2, or similar (and appropriate management) to create other neutral grassland in moderate condition.
- 4.2 The north-eastern corner of the other neutral grassland field will be enhanced through the creation of an orchard on retained grassland. It is considered that through favourable management the orchard will be able to pass the following criteria and therefore achieve moderate condition (passing 4 to 5 of 8 criteria):
- Less than 5% fruit trees are smothered by scrub (Criteria 2);
  - Evidence of formative pruning to maintain longevity of trees (Criteria 3);
  - At least 95% of trees free from damage caused by humans or animals (Criteria 4);
  - Sward height varied (between 5cm and 30cm) and small patches of bare ground present. Up to 10% cover of patches of tall herb vegetation may be present (Criteria 6); and
  - Absence of invasive non-native species and species indicative of sub-optimal conditions make up less than 10% ground cover (Criteria 8).
- 4.3 In addition, ponds P4 and P7 are retained under the proposed development.

### **Proposed Habitats**

#### Other Neutral Grassland

- 4.4 Where possible, areas of other neutral grassland will be created to maximise the biodiversity value of habitats within the site. These areas will be sown with a wildflower seed mix such as Emorsgate EM2, or similar, and will be managed in the long term to achieve moderate condition.

#### Modified Grassland

- 4.5 Where areas of modified grassland (amenity grassland) are to be sown within the areas of public open space, these will be sown with a flowering turf mix which comprises species which can withstand mowing, such that, with favourable management it is anticipated that these areas of grassland will support 6-8 species per m<sup>2</sup> and will be able to meet six (if not all seven) of the condition criteria. Therefore, the areas of modified grassland to be sown with the flowering lawn mix are anticipated to achieve good condition.
- 4.6 It is acknowledged that some areas, which will be turfed, will only achieve poor condition.

Mixed Native Scrub

- 4.7 Areas of mixed native scrub are proposed along the southern and south eastern boundaries of the site. The areas of scrub planting are considered to be large enough that they will be able to support clearings and glades and will be managed as such. With favourable management the areas of scrub are anticipated to be able to meet four (if not all five) of the condition criteria and therefore achieve moderate condition as a minimum.

SuDS Feature

- 4.8 Five SuDS features are proposed within the east of the site and are to be sown with a species-rich wetland seed mix. It is considered that these features will be able to pass the following criteria and therefore achieve moderate condition (passing 3 of 4 criteria):
- Diverse range of flowering plant species, providing nectar sources for insects (Criteria 2);
  - Invasive non-native species cover less than 5% of total vegetation; and
  - The water table is at or near the surface throughout the year (open water or saturation of soil surface).

Residential – Buildings, Hardstanding, Ornamental Planting and Gardens

- 4.9 Buildings and hardstanding are automatically given a condition score of 0 within the metric whilst gardens and ornamental planting are given an automatic condition score of 1.

Urban Trees

- 4.10 The exact species of the proposed urban trees are not known at this stage, and therefore a precautionary target condition of poor has been applied. Approximately 393 new small standards are proposed to be planted across the site in total.

**Summary**

- 4.11 With the target conditions set out above, proposed development is considered able to deliver approximately 63.86 habitat units, which results in a **net gain of 14.81 habitat units (25.48%)**.

**Linear Habitats - Hedgerows**

- 4.12 The majority of hedgerows and tree lines within and at the site boundaries are retained within the proposed development, albeit sections/hedgerows are lost within the middle and north of the site for internal access and to facilitate the central block of housing.
- 4.13 A number of hedgerows are proposed within the site, including native species-rich hedgerows and ornamental hedge planting. The ornamental hedgerows are given an automatic condition score of 1, whilst the native and native species-rich hedgerows are considered to be able to achieve moderate condition with appropriate management.
- 4.14 No detail is provided at this stage about the species to be planted within the native hedgerow and as such as a precautionary approach they have been input as native / native with trees. There is scope at the more detailed stage to make the hedgerows species rich, which would increase the hedgerow unit gain within the site.

### Summary

- 4.15 With the hedgerow types and target conditions set out above, proposed development is able to deliver approximately 25.96 hedgerow units, which results in a **net gain of 7.02 habitat units (27.63%)**.
- 4.16 There is the opportunity to increase the hedgerow net gain on-site through the provision of native species-rich hedgerows and / or achieving a target condition of good.

### Watercourse

- 4.17 The watercourses, ditch and brook sections, are largely retained and buffered within the proposed development.
- 4.18 The western end of the ditch will be culverted where the road crosses, albeit this has been designed to be in the area of least impact as this section is already partially culverted.
- 4.19 A small section of the brook will also be culverted for an access road to the south-eastern field.
- 4.20 In addition, small sections will be bridged where proposed footpaths cross the existing ditch and brook sections. These will be minor in impact and not affect the overall condition of the ditch or brook.
- 4.21 Given the type and nature of the ditch/brook present, it is considered that enhancement opportunities are limited due to the presence of the bankside vegetation (hedgerows would require removal) and levels of water flow/hydrology without impacting on the rest of the development (potentially causing flooding/drainage issues). As such, the proposed enhancements to the retained sections, such as enhanced bank top vegetation (reduced managed ground through creation of wildflower grassland), are not enough to reach the next condition category.

### Summary

- 4.22 With the minor loss in ditch and brook sections to culverts, to facilitate internal roads, the site will have a total of 3.45 units post-intervention, which results in a **minor loss of 0.12 habitat units (-3.28%)**.

## 5.0 BIODIVERSITY NET GAIN RESULTS

### Habitats

- 5.1 The baseline value of the site is 58.11 habitat units.
- 5.2 Through the retention and enhancement of habitats, where possible, along with the creation of other neutral grassland, native scrub, orchard, species rich amenity grassland and the provision of native urban trees, the post-development value of the site will be 72.92 habitat units.
- 5.3 The proposed scheme therefore will result in a net gain of 14.81 habitat units, which represent an increase of 25.48%.

## Hedgerows

- 5.4 The sites baseline hedgerow units is 25.42.
- 5.5 Although there will be hedgerow and tree line losses as a result of the proposed development, the creation of new native hedgerows, along with ornamental hedgerows, will result in a post-intervention score of 32.44 hedgerow units.
- 5.6 This equates to a net gain of 7.02 hedgerow units, which represent an increase of 27.63%.

## Watercourses

- 5.7 The sites baseline watercourse units is 3.57.
- 5.8 The ditch/watercourse are largely retained within the proposed development with only minor losses (culverting) to facilitate access. The proposed development will result in a post-intervention score of 3.45 river units.
- 5.9 This equates to a minor loss of 0.12 river units, which represent a loss of -3.28%. Whilst it is technically feasible to provide a net gain in river units, achieving the gain would require removal of existing hedgerows. The removal of such features to provide a minor gain to a receptors judged as being in poor/fairly poor condition is not considered to be proportionate given the limited impact of the proposals to watercourses.

## 6.0 CONCLUSION

- 6.1 The site is dominated by modified grassland in poor condition, along with areas of other neutral grassland, scrub, ponds, tall ruderal vegetation, buildings, hardstanding, gardens, ditch, watercourse, tree lines and hedgerows.
- 6.2 The proposed development has sought to retain and enhance habitats where possible and will create new habitats of value (other neutral grassland, moderate condition modified grassland, native scrub and hedgerows).
- 6.3 Overall, the proposed development will result in a gain of 14.81 habitat units (equivalent of 25.48%) and a gain of 7.02 hedgerow units (27.69%).
- 6.4 The proposals have been designed to limited impacts on the watercourse where possible and the minor loss in river units, of -0.12 (-3.28%), is not considered to be significant, with the functionality of the retained ditch/watercourse maintained.



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## Key

### Habitats Baseline

- Bramble scrub
- Developed land; sealed surface
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (Non- Priority Habitat)
- Ruderal/Ephemeral
- Un-vegetated garden
- Vacant/derelict land/ bareground

### Hedgerow Baseline

- Hedge Ornamental Non Native
- Line of Trees
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow

### Rivers Baseline

- Culvert
- Ditches
- Other Rivers and Streams

### Urban Trees Baseline

- Existing Medium

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 Site Boundary

-  Vegetated garden

Native Species Rich Hedgerow (h2NE2)

### Other Rivers and Streams

- Proposed Small

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17/11/2023

drawing / figure number  
**Figure 2**



0      50      100 m

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