Harworth Group

Gateway 36, Rockingham, Barnsley – Unit 4

Habitat Creation, Biodiversity Mitigation and Enhancement Scheme

December 2022

FPCR Environment and Design Ltd
Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd. Ordnance Survey material is used with permission of The Controller of HMSO, Crown copyright 100018896.

Rev	Issue Status	Prepared / Date	Approved/Date
-	Final	HEJ / 28.11.22	JD / 29.11.22
A	Final	JDH / 05.12.22	

CONTENTS

1.0 INTRODUCTION 3

2.0 HABITATS 3

3.0 PROTECTED SPECIES 7

FIGURES

Figure 1: Habitat Creation, Biodiversity Mitigation and Enhancement Plan

1.0 INTRODUCTION

1.1 The document has been produced by FPCR Environment and Design Ltd on behalf of Harworth Group to support a reserved matters application specific to Unit 4 of development within the wider Gateway 36 development. A corresponding scheme will be prepared for submission for approval of reserved matters for each subsequent phase. The extent of this phase is illustrated in Figure 1.

1.2 This report should be used to inform the design team and appointed contractors of the specifications required for the creation of a range of ecological habitats and species-specific enhancements. Indicative locations of the practical enhancements required, such as bat boxes, are also included.

2.0 HABITATS

Habitat Creation and Enhancement

2.1 Habitat creation and enhancement within the future Green Infrastructure will have the following aims:

- Create a green corridor which will encircle the development to provide visual screening and biodiversity assets enhancing habitat linkages through the earlier development phases and to the wider local area.
- Buffer adjoining habitats within the Dearne Valley Wetlands SSSI and the Short Wood and Hay Green LWS.
- Provide a diverse range of valuable woodland, scrub, grassland, and wetland habitats.
- Enhance retained woodlands and grasslands in the periphery of the site through an appropriate management scheme to ensure the long-term biodiversity value of these habitats.
- Provide mitigation for habitat loss for a range of species groups including bats, amphibians and birds including appropriate habitat creation.

2.2 Habitats to be created and enhanced within the future Green Infrastructure will be specified such that, under appropriate management measures, they will have long-term viability.

Key Habitats Details

2.3 All habitat works will be undertaken in accordance with landscape drawings issued by Urban Wilderness.

2.4 Habitat creation and enhancement specific to Unit 4 will have the following aims:

- Retain habitat connectivity for a range of species including bats. Habitat will be enhanced to provide a more graded wood-edge habitat which will support a wider range of invertebrate species to optimise foraging opportunities.
- Provide new habitat connectivity via a new hedgerow and ditch for amphibians.
- Provide a sensitive and diverse planting scheme to attract a range of invertebrates, especially lepidoptera.
- Enhancements will include bird and bat boxes.

2.5 Full management details are provided in the Landscape and Ecological Management Plan issued by Urban Wilderness. Biodiversity condition targets for new and retained habitats are provided below:

Broad-leaved Woodland

2.6 To reach the target condition of 'good', woodlands will be created and managed to meet all the following criteria:

1. This should be an area of trees with complete canopy cover.
2. Native species are dominant. Non-native and invasive species account for less than 10% of the vegetation cover.
3. A diverse age and height structure of the trees.
4. Free from damage [Bark stripping; Browse line; Damage shoot tips] (in the last five years) from stock or wild mammals with less than 20% of vegetation being browsed.
5. There should be evidence of successful (i.e. not browsed off before it gets well established) tree regeneration such as seedlings, saplings, and young trees.
6. Standing and fallen dead wood of over 20 cm diameter are present including fallen large dead branches/stems and stumps.
7. Wetland habitats if they exist within the wood has little sign of drainage or channel straightening.
8. The area is protected from damage by agricultural and other adjacent operations.
9. There should be no evidence of inappropriate management (e.g. deep ruts, animal poaching or compaction).
10. Invasive non-native[NB1] plants are below 5%.
11. No signs of significant nutrient enrichment present.
12. More than 3 different native trees and 3 shrub species in an average 10 m radius.

NB1: Invasive non-native species include- American skunk cabbage *Lysichiton americanus*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Reynoutria japonica*, Cherry Laurel *Prunus laurocerasus*, Shallon *Gaultheria shallon*, Snowberry *Symphoricarpos albus*, Variegated yellow archangel *Lamiastrum galeobdolon* subsp. *Argentatum*, Rhododendron *Rhododendron ponticum.*

Neutral Grassland

2.7 To reach the target condition of 'moderate', grasslands will be created and managed to meet all the following criteria:

1. The area is clearly and easily recognisable as a good example of this type of habitat and there is little difference between what is described in the relevant habitat classifications and what is visible on site.
2. Undesirable species[NB2] and physical damage should be <5% cover.
3. Cover of bracken should be <20% and scrub and bramble cover should be <5%.
4. Cover of bare ground should be >10%.

NB2: Undesirable species include- creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex otusifolius*, common ragwort *Senecio jacobea*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, white clover *Trifolium repens*, cow parsley *Anthriscus sylvestris*, marsh thistle *Cirsium palustre* and marsh ragwort *Senecio aquaticus*.

Scrub

2.8 To reach the target condition of 'good', scrub will be created and managed to meet all the following criteria:

1. There are at least three woody species, with no one species comprising more than 75% of the cover.
2. There is a good age range – a mixture of seedlings, saplings, young shrubs, and mature shrubs.
3. Pernicious weeds and invasive species[NB3] make up less than 5% of the ground cover.
4. The scrub has a well-developed edge with un-grazed tall herbs.
5. There are many clearings and glades within the scrub.

NB3: Undesirable species include- creeping thistle *Cirsium arvense*, common nettle *Urtica dioica*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Reynoutria japonica*, Cherry Laurel *Prunus laurocerasus*, Rhododendron *Rhododendron ponticum.*

Green Roof

2.9 An extensive green roof will be created and managed to meet all the following criteria:

1. A mixture of sedum/wildflower species should be used to provide food and habitat for a wide range of invertebrates.
2. Species will be chosen to maximise the flowering period for the roof, ideally from early March to late September.
3. The green roof should be free of invasive non-native species. Specific species that have long roots should not be removed in case they penetrate and damage the underlying geotextile and waterproofing membrane, including: Buddleia *Buddleja davidii*, dock species *Rumex sp.*
4. If annual/biannual wildflower species are grown, new seeds must be broadcast every year.

Native Species-Rich Hedgerows

2.10 To reach the target condition of 'moderate', native hedgerows will be created and managed with the aim of achieving all the following criteria.

1. The hedge has an average height of at least 1.5 m along its length.
2. The hedge has an average width of at least 1.5 m along its length.
3. The vertical gap between ground and base of canopy is less than 0.5 m.
4. The hedgerow is continuous with no horizontal gaps along the length of hedgerow.
5. The hedgerow and undisturbed ground is free of invasive non-native and neophyte species.

Street Trees

2.11 Street trees will be planted and managed to meet all the following criteria:

1. The trees should be allowed to mature into standard trees, targeting a minimum breast height diameter of 30 cm. This will provide nesting and foraging opportunities for local wildlife. Tree management should be limited to essential works, promoting tree health or for reasons of health and safety.
2. The trees should be protected from damage during establishment.
3. If any specimens die or fail to flourish, they should be removed and a new specimen of a type suitable for the conditions replanted.

3.0 PROTECTED SPECIES

3.1 The following section provides outline details of the enhancement measures required for the range of species found onsite, with enhancement features illustrated on Figure 1.

Bats

3.2 The development will result in an initial loss of foraging habitat and commuting habitat. New green infrastructure for Unit 4 includes a mix of grassland, scrub, and woodland, providing a diverse range of foraging habitats. Connectivity is achieved across the Site via woodland edges, tree lines and hedgerows.

3.3 Light spill from street and external lighting onto suitable habitat types for bats, such as hedgerows, or woodland edge, may indirectly impact upon the species that are dependent on them. To reduce the level and extent of light spill, lights in proximity to the above habitats will be fitted with light shields (baffles/louvres).

3.4 If tree management results in any trees requiring felling, they shall be assessed for bat roosts by a suitably qualified Ecologist prior to felling.

3.5 A range of bat boxes will be installed to provide enhancement to the schemes value for bats and will help to provide potential roost sites for bats within the large areas of newly created habitat that would otherwise be unable to support roosting bats for a number of years.

3.6 The boxes recommended are suitable for the range of bat species recorded on site. As there is an absence of mature trees, the boxes will be pole mounted, at a minimum height of 3m above ground. Recommended boxes comprise:

- 1 x pole mounted large colony box (double box) or similar
- 2 x suitable size wooden poles (minimum height 3m above ground) each supporting:
    - 2 x Schwegler 2F Bat Box or similar, suitable for smaller bat species
    - 2 x Vincent Pro Bat Box or similar, suitable for a range of bat species

Pole Mounted Large Colony Bat Box

Schwegler 2F Bat Box

Vincent Pro Bat Box

3.7 Bat boxes should be located following Bat Conservation Trust guidelines:

- positioned close to linear bat navigation aids such as hedgerows,
- positioned ideally at least 4m above the ground, but should follow the specific height requirements for the bat boxes purchased,
- positioned out of reach of opportunistic predators such as cats,
- positioned away from permanent and temporary artificial light sources,
- sheltered from strong winds but exposed to the sun for part of the day by positioning the entrance to the box facing south-west to south-east,
- positioned so that the entrance to the box is free of obstacles, such that there is a clean and clear flight path to the entrance.

3.8 The boxes must be installed by / under the supervision of a bat worker to ensure they are installed in optimum locations. Once installed they must only be opened, moved or disturbed by a bat worker holding the correct class of licence to ensure there is no breach of legislation. They should not be disturbed by works or any artificial lighting as part of the construction or built development

Birds

3.9 The development will result in an initial loss of habitat suitable for foraging and nesting birds. However, new green infrastructure includes a mix of grassland, scrub, and woodland, providing a diverse range of foraging habitats.

3.10 Willow tit *Poecile montanus* are a supported within the adjoining SSSI. New habitat creation on - site, particularly the scrub habitats, will provide additional foraging opportunities for this species. In the longer-term as the woodland matures, the provision of standing dead wood created through management will provide further nesting opportunities for this species.

3.11 To provide additional nesting opportunities while new planting establishes, a range of bird nest boxes will be provided:

a. 3 x small hole box - e.g. 1B Schwegler Nest Box 26mm Hole or similar, suitable for species including blue tit *Cyanistes caeruleus* and coal tit *Periparus ater*.

b. 3 x large hole box - e.g. 1B Schwegler Nest Box 32mm Hole or similar, suitable for species including great tit *Parus major*, blue tit, coal tit, and nuthatch *Sitta europaea*.

3.12 These should be individually sited at least 1.5m above the ground on existing trees or artificial poles with a clear flight path to the entrance but with suitable perches in the vicinity. These boxes should be located throughout the development in retained mature woodland, tree standards and new plantation.

3.13 In general, all bird boxes should be sited avoiding prevailing wind and rain, south-east is generally a preferred direction. Locations of all nest box types will be decided upon by an experienced ecologist who can advise the most appropriate location depending upon the species involved and their requirements in terms of surrounding habitat and favoured nest sites. This will ensure that the boxes receive the best chance of occupancy.

3.14 Removal of woody vegetation, including hedgerow sections and trees, should occur outside of the bird breeding season (March to August inclusive) to minimise the risk of disturbance to breeding

birds. If this is not possible, such vegetation must be checked prior to removal by a suitably experienced ecologist to confirm the absence of active nests.

3.15 If any nesting birds are present, the nest and the buffer (the size of which to be defined by the ecologist) surrounding it must be retained undisturbed until the birds have fledged. If works are undertaken outside of the bird breeding period, such restrictions do not apply.

Amphibians

3.16 Various records of amphibians have been recorded in, and adjacent to, the scheme. To further improve the scheme's value for amphibians log pile features will be created in association with the woodland.

Log Piles

3.17 Two areas of approximately 1x3m should be selected to house the log piles. Top soil / turf to 300mm should be removed from the footprint of the log pile so that it can used to cover the completed construction.

3.18 Larger logs and root balls initially to provide structure, followed by the remaining materials. The piles will be created with a diverse structure containing a mixture of sizes, shapes and wood species, with some small-diameter material present, and reach at least 0.75 m high. The wood piles should be secured using sturdy wire to discourage their removal by members of the public.

3.19 Following the completion of the timber core, topsoil will be spread across the surface of the pile and the stripped turf replaced.

Image 1: Example Log Pile

Other Species

3.20 Within the broadleaved woodland, arisings from any tree management activity will, where appropriate, be retained on site in piles to create wood habitat to maximise invertebrate and bryophyte biodiversity. Where it accords with health and safety inspection, standing dead wood will be left in-situ to provide additional dead wood habitats.

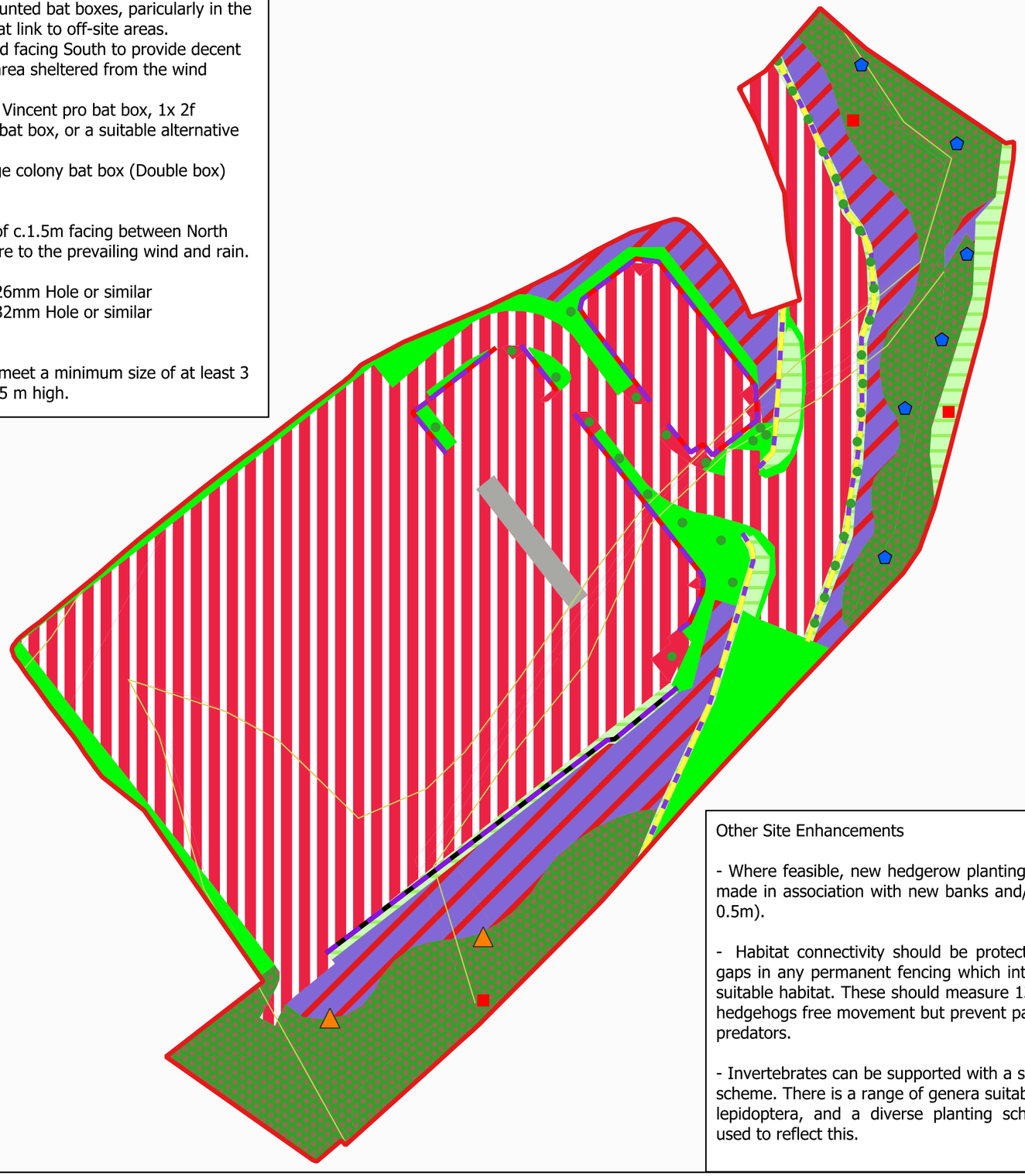
3.21 Gaps should be provided through any fences installed within the green infrastructure (13 x 13 cm) to maintain connectivity for hedgehogs.

Installation
BAT BOXES
- Opportunities exist to provide additional roosting sites for bats in the form of pole-mounted bat boxes, paricularly in the woodland edge habitats, that link to off-site areas.
- Bat boxes should be placed facing South to provide decent exposure to sunlight in an area sheltered from the wind where possible.
Two poles to have both 1x Vincent pro bat box, 1x 2f schwegler general purpose bat box, or a suitable alternative as agreed with ecologist
One pole with mounted large colony bat box (Double box)

BIRD BOXES
To be installed at a height of c.1.5m facing between North and East to prevent exposure to the prevailing wind and rain.

3x 1B Schwegler Nest Box 26mm Hole or similar
3x 1B Schwegler Nest Box 32mm Hole or similar

LOG PILES
All log piles created should meet a minimum size of at least 3 m long, by 1 m wide by 0.75 m high.



Other Site Enhancements

- Where feasible, new hedgerow planting on site is to be made in association with new banks and/or ditches (>/= 0.5m).

- Habitat connectivity should be protected by including gaps in any permanent fencing which intersects areas of suitable habitat. These should measure 13x13cm to allow hedgehogs free movement but prevent passage for larger predators.

- Invertebrates can be supported with a sensitive planting scheme. There is a range of genera suitable for species of lepidoptera, and a diverse planting scheme should be used to reflect this.

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

UKHab Materials: © UKHAB LTD. No onward licence implied or provided. All rights reserved https://ukhab.org/commercial-eula/

Key

Unit 4

Unit 4 Biodiversity Enhancements

- **Bat Boxes**
- **Bird Boxes**
- **Log Piles**

Proposed Habitats

- **Street Trees**
- **Native species-rich hedge**
- **Native species-poor hedge**
- **Ornamental hedge**
- **Amenity Grassland**
- **Broadleaved Woodland**
- **Developed land, sealed surface**
- **Green Roof**
- **Mixed Scrub**
- **Neutral Grassland**
- **Ornamental Planting**

client
Harworth Group PLC

project
Unit 4 - Gateway 36
Rockingham

drawing title
Habitat Creation, Biodiversity Mitigation and Enhancement Plan

scale @ A3
1:1500

drawn

issue date
5/12/2022

drawing / figure number
Figure 1

rev
A

N

FPCR Environment and Design Ltd, Lockington Hall, Lockington, Derby, DE74 2RH ■ t:01509 672 772 ■ e: mail@fpcr.co.uk ■ w: www.fpcr.co.uk ■
masterplanning ■ environmental assessment ■ landscape design ■ urban design ■ ecology ■ architecture ■ arboriculture

J:\6400\6424\QGIS 2.14 NEW\Plans\Post Planning\6424-E-01 Unit 4 Hab Creation Bio Mitigtion and Enhancement.qgs