Harworth Group

Dearne Valley Parkway, Rockingham, Barnsley – Phase 3

Habitat Creation, Biodiversity Mitigation and Enhancement Scheme

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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 Phase 3 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 initial 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 range of ecological habitats and species-specific enhancements to be created, including indicative locations of the practical enhancements required such as bat boxes.

2.0 HABITATS

Habitat Creation and Enhancement

2.1 Principal habitat creation and management measures will be focused on ensuring that where habitats are to be created within the future Green Infrastructure they will be created in a sensitive manner, with the long-term viability and success of the created habitats as the primary aim.

2.2 The aim of all habitat creation and enhancement will be to:

- 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.

Key Habitats Details

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

2.4 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:

<u>Neutral Grassland</u>

2.5 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[NB1] and physical damage <5% cover.
3. Cover of bracken <20% and scrub and bramble <5%.

NB1: 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*.

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[NB2] 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.

NB2: 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.*

Ponds

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

1. Good water quality, with clear water (substrate can be seen) and no obvious sign of pollution in the water body.
2. Not shaded more than 50%
3. Not stocked with fish, and if present should contain only a native fish assemblage.
4. Non-native species should be absent
5. Less than 10% of the pond should be covered with duckweed or filamentous algae

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 (except common juniper, sea buckthorn or box, which can be 100% 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.*

Native Hedgerows

2.9 Native hedgerows will be created and managed with the aim of achieving all the following criteria, there is some allowance for minor variance. (No more than 2 failures in total and no more than 1 in any functional group.)

A1. Height >1.5 m average along length.

A2. Width >1.5 m average along length.

B1. Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees').

B2. Gaps make up <10% of total length and no canopy gaps >5 m.

C1. >1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length (measured from outer edge of hedgerow) and is present on one side of the hedge (at least).

C2. Plant species indicative of nutrient enrichment[NB4] of soils dominate <20% cover of the area of undisturbed ground.

D1. >90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species.

D2. >90% of the hedgerow or undisturbed ground is free of damage caused by human activities.

NB4: Undesirable species include- nettles (Urtica spp.), cleavers *Galium aparine*, and docks (Rumex spp.).

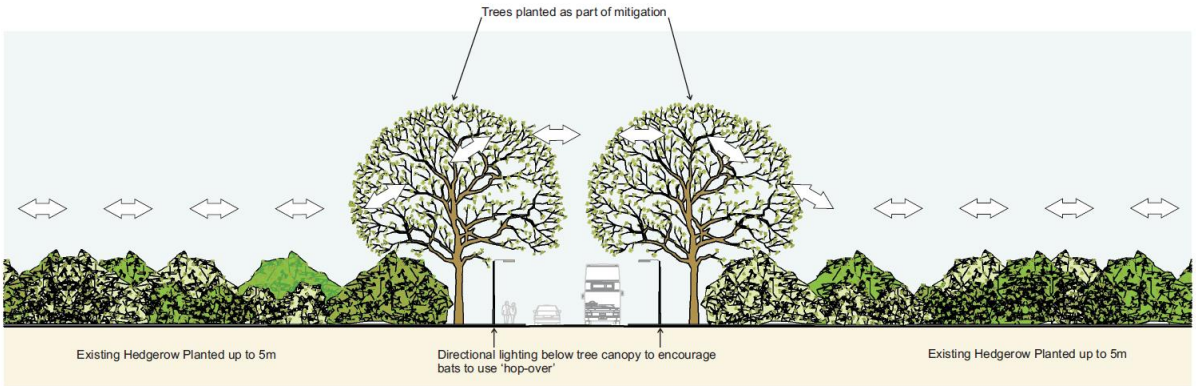
3.0 PROTECTED SPECIES

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 includes a mix of wetland, grassland, scrub, and woodland, providing a diverse range of foraging habitats. Woodland edges, tree lines and hedgerows connect across the site, including the provision of a hop-over spanning the access road.

3.3 These will be designed to minimise any potential impact to foraging/commuting routes connecting to the wider landscape. The planting will include the implementation of hop-overs comprising standard trees adjacent to the road/footpath which will grow to be above the level of vehicle movement. The lower branches of such trees should be regularly pruned back to the trunk to ensure that the most suitable flight line is above the maximum traffic height (where applicable low-level lighting columns may also be used in this instance to reduce the likelihood of the bats using the lower tree regions). The implementation of such 'hop-overs' will allow continued echolocation across the break thereby allowing continued usage of the hedgerow as a foraging/commuting area. It will also reduce the potential for road traffic accidents to bats (and for birds).



FPCR Ltd. 2009. Bat hop-over illustrative section

3.4 The unmitigated lighting of suitable habitat types, such as hedgerows, trees (including the 'hop-over') 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).

3.5 Further to this a range of bat boxes will be installed to provide enhancement to the schemes value for bats. The boxes recommended are suitable for the range of species recorded on site. In the absence of mature trees, boxes will be pole mounted at a minimum of 3m. Box placements will avoid north facing aspects. These boxes will be positioned along the green infrastructure corridor around the mitigation pond at the northern tip of the development site. This will help to provide roosting site for bats as the new habitats develop.

3.6 These will comprise:

- 1 x pole mounted colony box (double box) or similar

- 2 x Suitable size (minimum 3m above ground) wooden poles each supporting:
- -2 x Schwegler 2F box or similar
- -2 x Vincent Pro Bat Box Bat Box or similar

Pole Mounted Large Colony Bat Box

Schwegler 2F

Vincent Pro Bat Box

3.7 These boxes will provide potential roost sites within the large areas of newly created habitat that would otherwise be unable to support roosting bats for a number of years.

3.8 The boxes must be installed by / under the supervision of a licenced bat worker to ensure they are installed in optimum locations.

Birds

3.9 The development will result in an initial loss of habitat suitable for foraging and nesting birds.

3.10 New green infrastructure includes a mix of wetland, grassland, scrub, and woodland, providing a diverse range of foraging habitats.

3.11 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.

3.12 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

b. 3 x Large hole box - e.g. 1B Schwegler Nest Box 32mm Hole or similar

3.13 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.

3.14 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.

Amphibians

3.15 Various records of amphibians have been recorded in, and adjacent to, the scheme. To further improve the scheme's value for amphibians several hibernacula features will be created in association with the new attenuation feature.

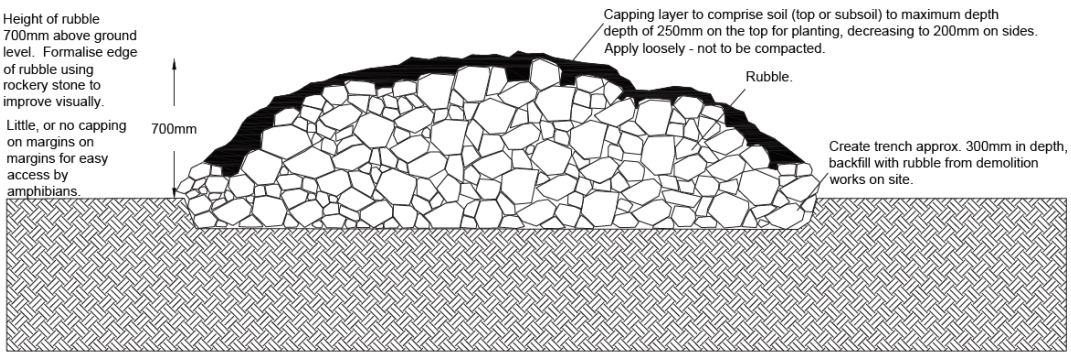
Hibernacula

3.16 The central core of each hibernaculum can contain a range of materials, including root balls, cut timber, brash, inert hardcore, bricks, rocks, root balls. These materials should ideally be sourced from site clearance works. All hibernacula created should meet a minimum size of at least 3 m long, by 1.5 m wide by 0.75 m high, and ideally much larger.

3.17 Topsoil / turf should be removed from the footprint of the hibernaculum so that it can used to cover the completed construction. A pit should be dug to a depth of approximately 50cm and back filled with, larger rubble and root balls initially to provide structure, followed by the remaining materials. The top of the structure should them be profiled and the stripped turf replaced.

3.18 There should be access points around the edges. These are best created by ensuring that timber or rubble protrudes from the edge, creating crevices that allow reptiles to get deep inside.

3.19 It can be beneficial to plant or translocate scrub to the immediate north of the feature, as this will provide shelter and cover.



Section through Hibernacula - NOT TO SCALE

Newly Created Hibernacula

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.
Poles 1 & 3: Each pole to have both 1x Vincent pro bat box, 1x 2f schwegler general purpose bat box, or a suitable alternative as agreed with ecologist
Pole 2: Pole 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

HIBERNACULA
All hibernacula created should meet a minimum size of at least 3 m long, by 1.5 m wide by 0.75 m high, and ideally much larger.

Base Map: 441-UW-P-001 Rev.D
Landscape Framework Plan
Urban Wilderness 2022

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Key

- Bat Hopover
- Bat boxes (with ref)
- Hibernacula
- Bird Boxes

Other Site Enhancements

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

- Hedgehogs are known to be present in the wider area. 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.

-To minimise any potential impact to foraging routes areas either side of the new access roads should be reinforced with native species planting to create bat "hop-overs". The planting will include standard trees adjacent to the road which will grow to be above the level of vehicle movement. The lower branches of such trees should be regularly pruned back to the trunk in order to ensure that the most suitable flight line is above the maximum traffic height (where applicable baffles or low-level lighting columns may also be used to reduce light spill into the canopy).

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