Barratt Homes Manchester

Henthorn Road, Clitheroe

HABITAT CREATION AND MANAGEMENT PLAN

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1.0 INTRODUCTION

1.1 This management plan has been produced to inform future management of a proposed development site at Henthorn Road, Clitheroe as required by condition 20 of The Planning Inspectorate Appeal Decision APP/T2350/A/11/2161186 which states that: no site clearance, preparation or development shall take place until a habitat creation/enhancement and management plan and programme has been submitted and approved by the Local Planning Authority.

1.2 The proposed development site off Henthorn Road, Clitheroe, Lancashire is approximately 15.7ha in size, and primarily consists of intensively managed improved grassland of negligible value to nature conservation. Habitats of greater value include species rich semi-improved grassland, hedgerows, which are a habitat of principal importance under the Natural Environment and Rural Communities Act 2006 (NERC), mature trees and a partially culverted stream. The western boundary is defined by the River Ribble and the grounds of a caravan and camping park. Residential properties lie to the north east, with farmland lying to the south and north. Henthorn Road defines the south eastern boundary.

1.3 Information obtained last year from the Lancashire Wildlife Trust shows that the River Ribble, is designated as a non-statutory site of importance for nature conservation. The River Ribble from London Bridge Road Preston, in the west, to the County Boundary in the East is a Lancashire County Biological Heritage Site (BHS). The river and its associated semi-natural habitats have been designated as they support a rich assemblage of plants and animals specifically salmon *Salmo salar*, sea trout *Salmo trutta*, otter *Lutra lutra* and water vole *Arvicola amphibius*.

1.4 No records of protected species were returned within or adjacent to the site boundary. A historical record of water vole dating back to 1969 was returned from approximately 1.5km upstream from the site boundary along the River Ribble. A site survey in 2011 recorded the presence of an otter spraint on the bank of the river adjacent to the site. There was also a record for Solomon's seal *Polygonatum multiflorum* at Siddows Wood in the southern section of the site along the River Ribble which dated back to 2004. This species was listed as being on the Lancashire Biodiversity Action Plan Provisional Long List.

1.5 Proposals for the site include the construction of up to 270 residential dwellings and associated infrastructure. The development of this site will result in loss of some hedgerows and improved grassland of low ecological value

1.6 The landscape design throughout the site embraces the latest government objectives for the provision of Green Infrastructure (GI) designed to ensure that the residents of proposed communities have easy convenient access to a healthy natural environment.

1.7 Natural England, the government's regulatory agency responsible for biodiversity and GI, established nine key principles in their 2009 Policy Statement, stating that GI must :

- Be delivered via a co-ordinated network that provides the broadest range of ecosystem services and environmentally based social benefits. These include embedding wildlife, rich and varied habitat in urban and rural areas, providing recreational spaces (with consequent health benefits), supporting education and providing climate change adaptation measures;
- Emphasise the 'multifunctionality' of the green network as a whole and, as appropriate, of individual sites;

- Be delivered by co-ordinated planning, delivery and management across local authority departments and boundaries and across different sectors;
- Seek physical and functional connectivity between sites at all levels and right across a town, city or sub-region, shaped by local character and distinctiveness in terms of species, habitats, landscape and townscape;
- Incorporate all the green spaces of a town or city, both public spaces and private gardens, and connect with the wider countryside;
- Involve local communities in the design and management of green space;
- Be delivered primarily through focussed GI strategies and the spatial planning system of Regional Spatial Strategies and Local Development Frameworks;
- Provide a strategic framework for identifying and protecting those brownfield sites that represent important habitats or very valuable social spaces, and
- Be established as a permanent resource with financial support for its continued maintenance and adaptation.

1.8 This approach has now been reinforced with the publication in March 2010 of "Nature Nearby", Natural England's updated Accessible Natural Greenspace Guidance. The foreword states :

We need nature nearby. We know that greener places are better places to live – more relaxing, more enjoyable to come home to after a hard day at school or work, kinder to our souls, and more likely to make us want to look after and protect them.

Evidence shows that nature's good for our health. Natural green places provide natural solutions to many 21st century diseases – obesity and inactivity; heart disease and strokes; depression and mental illness. In difficult times, they provide cost effective treatment and improve people's lives.

Green spaces are also our insurance policy against the impacts of climate change. Trees, green roofs and public parks can make urban areas cooler. They help reduce the impacts of flooding, keeping homes and businesses dry. That's carbon free air conditioning and natural flood protection for millions of people. Nature's technology makes good economic sense too.

Nearby Nature – good for people, good for wildlife, good for the environment.

1.9 Essential key components of the green infrastructure and associated management include :
The creation of areas of grassland and shrub planting in association with retained hedgerows, ponds and ditches to improve foraging and refuge opportunities for local wildlife

- Re-stocking hedgerows to provide enhanced linkages for wildlife to the wider environment
- The provision of a well connected recreational resource for the urban population, affording easy access to the wider countryside beyond
- Retention of the existing network of hedgerows as the basis for GI route throughout the built environment,
- The use of creative conservation techniques throughout the project, including gardens and, where appropriate, buildings, with integrated habitats,
- The creation of accessible multi-purpose greenways throughout the urban realm

1.10 With this comprehensive GI approach embodied in the Masterplan, the proposed development can become an exemplar project for the principles and benefits of “Nature Nearby”.

2.0 BACKGROUND

2.1 It is intended that the bulk of the work will be carried out by a dedicated management company. The final details of the management arrangements are the subject of further discussions.

2.2 The Green Infrastructure Plan (drawing TW/HR/GIP/01) illustrates the location of the proposed new grassland, woodland, and trees and shrubs within the context of the retained habitats.

2.3 Specific habitat opportunities for bat, water vole, white-clawed crayfish and birds will be provided. Existing features of value such as hedgerows and mature trees are to be retained and enhanced wherever possible within the landscape design.

2.4 A similar creative approach will be pursued throughout the built development. Building integrated habitats such as bird boxes and bat tubes will be incorporated on appropriate buildings. Wildlife gardening techniques will be promoted across the residential area, with initial garden planting utilising native species of trees, climbing plants and shrubs

2.5 A careful balance will need to be reached regarding the competing requirements of wildlife and residents who will utilise areas of shared open space for recreational purposes. Ongoing public information and education will be an important element of this approach, provided by way of public liaison. The overall objective is to make the entire development wildlife friendly, and in particular that retained habitats within the site remain of suitable quality for use by protected species and provide enhanced biodiversity within the development in the future.

Factors Influencing Management Proposals

River Ribble Biological Heritage Site

2.6 Part of the River Ribble BHS runs adjacent to the site’s western boundary and is currently suitable for use by otters and water voles. As a component of this management plan it is proposed that funds are made available to implement management and enhancement works adjacent to the river.

2.7 No evidence of water vole was found during two surveys undertaken in 2011 and 2012, however, evidence of the presence of otter was found in the 2011 survey.

Bats

2.8 Transect surveys identified sporadic bat activity over the entire site, particularly associated with hedgerows. The area of greatest activity was found over the River Ribble.

2.9 The vast majority of the existing hedgerow network is to be retained and enhanced with additional tree and shrub planting. All lighting will be designed in accordance with the Institute of Lighting Engineers guidance to minimise light spill and consequential pollution. Careful planting and management of hedgerows and trees together with a sensitive lighting plan will maintain and enhance bat commuting routes and foraging opportunities.

Birds

2.10 Features of greatest value for breeding birds are being retained and enhanced within the design. Two dry ponds on site are to be improved as part of a wetland habitat area for the benefit of local wildlife, and two new ponds are to be created within the development as part of the balancing features on site. Significant new areas of grassland, shrub and tree planting will be created. A substantial area of domestic gardens will also result from the development, with attendant beneficial habitat potential for birds.

White-clawed crayfish

2.11 Despite the presence of some suitable habitat within the watercourse on site no white-clawed crayfish were observed during surveys. Given that there are records of white clawed crayfish within the catchment enhancements will be made to the stream to encourage its colonisation by this species.

Water vole

2.12 The watercourse running from the culvert on site to fields beyond the site boundary was considered sub-optimal for water voles due to the poaching of the banks by cattle, over shading and a lack of marginal and aquatic plants which could offer foraging resources. It is intended that this stream is enhanced to provide conditions more suitable for water voles by fencing to prevent further degradation of the banks, reprofiling of the stream bed to provide some deeper water, removal of some over shading vegetation, and sympathetic planting of aquatic and marginal vegetation.

3.0 OBJECTIVES

Ideal Long–term Ecological Management Objectives

3.1 The main objectives for the site are based on the requirement to maintain and enhance the nature conservation value of the retained habitats, mitigating for the loss of hedgerow and species foraging areas whilst contributing to objectives of the UK Post 2010 Biodiversity Framework. Management efforts will in particular focus on the enhancement of retained habitats for use by bats, otters, water voles, white clawed crayfish and birds to both retain existing populations, and to provide suitable habitat for use by species that have not been recorded within the site.

3.2 Created and enhanced habitat will provide improved features for biodiversity within the area and act to buffer any potential impacts on the retained features Retained habitat corridors and sympathetic management will aim to encourage the natural dispersal of species within the site and surrounding habitats and contribute to the maintenance of ecologically valuable habitat in the long-term.

Objective 1:

3.3 Maintain and enhance the existing nature conservation value of retained features including hedgerows and trees, grassland and water courses and associated habitats.

Objective 2:

3.4 Create new habitats to compensate for loss of and impacts to existing habitats, enhance biodiversity of the local area and maximise value through appropriate management ensuring significant green links are maintained and created.

Objective 3:

3.5 Balance recreational use of the site with the wildlife interests within the site.

4.0 HABITATS TO BE RETAINED, PROTECTED AND ENHANCED

Objective 1

4.1 Maintain and enhance the existing nature conservation value of retained features including hedgerows and trees, grassland, and water courses and associated habitats

Hedgerows and Trees

4.2 The vast majority of hedgerows and trees are to be retained across the site. During construction all retained hedgerows will be protected by high visibility fencing erected at an appropriate distance from the outside edge of the hedgerow. All trees will be protected by fencing erected according to their calculated root protection area (RPA). An ecological clerk of works will be required to visit the site on a regular basis to check that protective fencing is in place and that no works are encroaching into these areas.

4.3 Hedgerows will be gapped up using locally sourced native woody species including field maple *Acer campestre*, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and dog rose *Rosa canina*. Where possible a percentage of hedgerows will be laid. Others will be managed in rotation, cutting only one side annually to ensure that there is a continuous supply of fruit during the winter months for birds and small mammal species.

4.4 The majority of the existing hedgerow trees are to be retained in order to maintain connectivity and encourage biodiversity within the site by providing potential roosting sites and habitat niches for fauna such as bats and birds. Mature trees will be left unmanaged unless otherwise dictated for reasons of public safety. If some limb removal or complete removal is required then the cut limbs will be stacked as dead wood piles, adjacent to hedgerows or pond edges, except for any elm *Ulmus* sp, which will be removed from the site to discourage development of Dutch elm disease.

Grassland

4.5 Before any works can begin efforts must be made to control and remove invasive species including Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera*. A separate method statement has been produced for control of these species and is provided at Appendix 1.

4.6 Semi-improved grassland areas on site are to be retained where possible. The field that lies adjacent to the River Ribble Way footpath is intended to become part of a community park, whilst the small area of grassland on the western edge of the stream is a component of the green

corridor that runs through the centre of the site and will be retained in places where it will be unaffected by work to open up the watercourse.

4.7 Once invasive species removal works have taken place green hay is to be spread onto retained grassland areas. If possible, this should be sourced locally. The hay would be cut, transported and spread on the same day in mid-July to early September. The hay should be left for at least one week in dry weather, or three weeks in wet weather to allow seeds to fall, and then be lightly rolled. This will add a more diverse seed mix to the area and promote its use by a wider range of invertebrate species.

4.8 Soils in the retained improved grassland areas should be stripped and the ground reprofiled in some areas to allow seeds from the green hay to establish. Other areas should be mown and the arisings removed. Once this has been done and the top soil reinstated in stripped areas they should be spread with the same green hay mix as used on the semi improved areas. Initial management of this grassland will include maintaining a short sward immediately following hay spreading up to November.

Water courses

On site stream

4.9 The current condition of the watercourse and associated margins are of poor quality and will be subject to enhancement through “opening-up” resulting from the removal of the culvert and dense vegetation adjacent to the stream. The banks would be re-profiled to provide banks at 45° to 70° from horizontal and incorporate a marginal shelf allowing the development of emergent and marginal aquatic vegetation.

4.10 Parts of the stream bed should be re-profiled to incorporate pools and riffles. Deeper pools with associated bank side vegetation should encourage the streams use by water voles whilst riffles will allow its colonization by numerous species and aeration of the water will be increased.

4.11 Whilst the majority of the banks should be planted some should be allowed to naturally vegetate, whilst small areas should be left bare in a variety of different situations and on various substrates to add diversity to the water margins.

4.12 To prevent bank side degradation the stream should be protected by a knee high rail to demarcate the watercourse area and to discourage the general public from entering it.

4.13 Suitable substrate should be placed in the channel to provide more suitable habitat for white-clawed crayfish, should they be present in the wider area. A number of other species, including invertebrates and possibly fish would also be encouraged to use these areas.

4.14 Any woody debris that accumulates within the watercourse through natural processes, such as shedding of tree limbs, should be left *in-situ* as it provides an essential part of its ecology, and provides refugia for white clawed crayfish, invertebrates and fish.

River Ribble BHS

4.15 Prior to remediation works, stands of Himalayan balsam were recorded along the river bank. In the absence of catchment wide management, it would be difficult to eradicate the species from the watercourse, however annual monitoring will be undertaken and if present appropriate management to ensure that the species does not dominate (see Appendix I). Dependent on the

position and extent of the species, management may involve a mechanical cut before July (strimmed below the lowest node), hand-pulling, and spraying with an Environment Agency (EA) approved herbicide. Management should be undertaken spring / early summer (prior to flowering and seed-set) and in the absence of further infestation.

4.16 After the above treatment has taken place banks and upper margins of the river would be seeded with a tussocky grassland mixture and selective tree and shrub planting. Such habitat will provide additional terrestrial habitat for wildlife including invertebrates. A mix such as Emorsgate EM8 Meadow Mixture for Wetlands or similar should be used, the composition of which is:

Herbs

Betonica officinalis	Betony (0.4)
Centaurea nigra	Common knapweed (1)
Filipendula ulmaria	Meadowsweet(0.3)
Galium verum	Lady's bedstraw (1.8)
Leucanthemum vulgare	Oxeye daisy (1.5)
Lotus pedunculatus	Greater birdsfoot trefoil
Plantago lanceolata	Ribwort plantain (1)
Primula veris	Cowslip (1)
Prunella vulgaris	Selfheal (2)
Ranunculus acris	Meadow buttercup (3)
Silene dioica	Red campion (1)
Rhinanthus minor	Yellow Rattle (1.6)
Rumex acetosa	Common sorrel (1.2)
Sanguisorba officinalis	Great burnet (0.5)
Silaum silaus	Pepper saxifrage (1)
Silene flos-cuculi	Ragged robin (0.3)
Succisa pratensis	Devil's-bit scabious (0.4)
Vicia cracca	Tufted vetch (2)

Grasses

Agrostis capillaries	Common bent (12)
Alopecurus pratensis	Meadow foxtail (5)
Anthoxanthum odoratum	Sweet vernal-grass (1)
Cynosurus cristatus	Crested dog's-tail (36)
Deschampsia cespitosa	Tufted hair-grass (1)
Festuca rubra	Red fescue (26)

4.17 The lower margins of the banks (within 1m of the water's-edge) would be left to naturally colonise, ensuring the development of species of local provenance.

5.0 HABITATS TO BE CREATED

Objective 2

5.1 Create new habitats to compensate for loss of and impacts to existing habitats, enhance biodiversity of the local area and maximise value through appropriate management ensuring significant green links are maintained and created.

General

5.2 The existing dry ponds will be enhanced to create a wetland area, and two balancing ponds will also be created within the site. A community park is to be created by enhancing the retained improved grassland through the creation of new areas of tussock and species rich grassland and by planting woodland, native trees and scrub. Planting of new native shrubs and standard trees will be carried out across the residential area including in rear gardens to create new corridors through the site and encourage wildlife including protected species. The valley alongside the onsite watercourse will be retained as part of the balancing facilities and this will be seeded with an inundation grassland mix and plug planted with herbs such as purple loosestrife.

Ponds and wetland area

5.3 The two existing dry ponds will be dug to below the water table and peripheral vegetation around the ponds will be removed to increase light penetration.

5.4 Marginal habitats will be improved via the planting of appropriate species such as yellow iris *Iris pseudacorus*, water cress *Rorippa nasturtium-aquaticum*, branched bur reed *Sparganium erectum*, purple loosestrife *Lythrum salicaria*, water forget-me-not *Myosotis scorpioides*, nodding bur-marigold *Bidens cerna*, pale persicaria *Persicaria lapathifolia* and brooklime *Veronica beccabunga*.

5.5 The area between the two new ponds should be landscaped to create depressions of varying depth that will be seasonally inundated. These should have shallow sides (approx 2% gradient). Shallower depressions that will experience occasional inundation should be seeded with a wet grassland seed mix. Species suitable for inclusion in this mix are:

Achilliea millefolium	Yarrow
Centaurea nigra	Black knapweed
Filipendula ulmaria	Meadowsweet
Galium verum	Lady's bedstraw
Leucanthemum vulgare	Ox-eye daisy
Lotus pedunculatus	Greater bird's-foot trefoil
Lychnis flos-cuculi	Ragged robin
Plantago lanceolata	Ribwort plantain

Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow buttercup
Rhinanthus minor	Yellow rattle
Rumex acetosa	Common sorrel
Silaum silaus	Pepper saxifrage
Stachys officinalis	Betony
Succisa pratensis	Devil's-bit scabious
Grasses	
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus pratensis	Meadow foxtail
Cynosurus cristatus	Crested dog's-tail
Festuca rubra	Red fescue
Poa pratensis	Smooth-stalked meadow grass

5.6 Tall ruderal species will provide valuable habitat for invertebrates. These species should be left to colonise naturally with their spread monitored and controlled.

5.7 Periodic dredging may need to take place in order to ensure that variation in habitats is maintained in the wetland area over time, the frequency of which will depend on the information gathered during monitoring. Marginal vegetation should be monitored to ensure that it does not engulf open water. At least 50% of the water should be retained free of marginal vegetation. If clearance is required only one-third or less of marginal areas should be cleared annually on a rotational basis during autumn. Arisings should be left next to the open water for at least 48 hours to allow invertebrates to return, and then removed to a designated composting site.

5.8 Information boards will be installed to discourage the introduction of fish, feeding of waterfowl, disturbance by dogs, etc.

Balancing Facilities

5.9 Two new balancing ponds will be created within the residential area. These will be created to be compatible with the sustainable urban drainage system (SUDS) on site so to help naturally manage run off and add biodiversity. These ponds will be left to naturally colonise by species of local provenance.

5.10 Buffer zones will be created around the balancing pond peripheries through creation of tussocky grassland and selective tree and shrub planting. Such habitat will provide additional terrestrial habitats for amphibians as well as habitats for other wildlife including invertebrates, and will in addition discourage the public from accessing the ponds. Species used will include those used to enhance the river bank (paragraph 4.16)

Ditch

5.11 An existing ditch in the north west corner of the site is to be culverted to allow the construction of a pedestrian & cycle path in this area. A new 10m ditch is to be dug just to the south east of this culvert and will be planted with a wet grassland seed mix such as the one suggested in paragraph 5.5 above.

5.12 Periodic dredging may need to take place from time to time. The ditch should be monitored to ensure that it does not get engulfed by marginal vegetation. If clearance is required only one-third or less of marginal areas should be cleared annually on a rotational basis during autumn. Arisings should be left next to the open water for at least 48 hours to allow invertebrates to return, and then removed to a designated composting site.

Native Species Rich Grassland

5.13 Before any works can begin efforts must be made to control and remove invasive species including Japanese knotweed and Himalayan balsam (see Appendix I).

5.14 Once this remediation work has taken place the retained area of improved grassland that is to form part of the community park is to be mown and then spread with green hay/seed as described above (paragraph 4.7)

5.15 The grassy verges of retained green corridors within the residential areas will be enhanced with a species rich neutral grassland seed mix (MG5) reflecting species present in the area. A suitable mix of local provenance should be sourced from a reputable native wildflower supplier, using either an appropriate off-the-shelf mix or a specifically designed mix for this site. Species used will include plants that are attractive to invertebrates within the local area, for example:

Wildflowers

Achillea millefolium	Yarrow	1.5%
Agrimonia eupatorium	Agrimony	1%
Centaurea nigra	Black knapweed	1.5%
Filipendula ulmaria	Meadowsweet	1.5%
Galium verum	Lady's bedstraw	1.5%
Leontodon hispidus	Rough hawkbit	1%
Leucanthemum vulgare	Ox-eye daisy	1.5%
Lotus corniculatus	Common bird's-foot trefoil	0.5%
Plantago lanceolata	Ribwort plantain	2%
Prunella vulgaris	Self heal	1.5%
Ranunculus acris	Meadow buttercup	1.5%
Ranunculus bulbosus	Bulbous buttercup	1.5%
Rhinanthus minor	Yellow rattle	1.5%

Grasses

Anthoxanthum odoratum	Sweet vernal grass	2%

Agrostis capillaris	Common bent	14%
Cynosurus cristatus	Crested dog's tail	24%
Festuca rubra	Red fescue	36%
Trisetum flavescens	Yellow oat-grass	6%

5.16 All seed mixes will be sown during the spring or autumn, after which they will be subject to varied cutting regimes. The first cut will take place once the grass has reached a height of 100mm, then mown 2-3 times in the first year. Pernicious weeds will be spot-treated with herbicide as necessary. Once grassland has established selected areas will be subjected to different cutting regimes on a rotational basis. This will include a twice annual cut in early spring and summer and a once annual cut during the early spring or late summer. This will ensure that a continuous supply of nectar and seeds for local fauna are available across the site and floristic diversity is maintained. The different sward lengths will provide habitat diversity of interest to a range of local fauna including invertebrates, butterflies and small mammals. Selected areas including public paths will be cut on a more regular basis (three to four times a year). All arisings will be left in-situ for 48 hours following cutting, to allow appropriate time for seeds to fall and any invertebrates to move back into the sward. Following this arisings will be removed to prevent soil enrichment and thatching. Arisings will be used to create compost piles in suitable locations, which will provide hibernacula and breeding habitat suitable for reptiles, amphibians and invertebrates. Marginal areas adjacent to hedgerows, shrub planting and ponds should be cut once on alternate years with some ruderal species being allowed to colonise for further species and habitat diversity. Scrub encroachment should be monitored on a regular basis and removed as necessary.

5.17 If the spread of green hay fails to increase the botanical composition of the grassland, then further intervention such as repeat spreading or plug planting will be required.

5.18 In order to provide grassland of greater structural, areas of more coarse "tussocky" grassland will be created along the tops of the stream bank and around the margins of open spaces and the community park in association with the proposed hedgerows and structural planting and existing boundary features. Following completion of ground works these areas would be seeded with Emorsgate EM10 or similar.

Woodland and trees

5.19 A woodland area is to be created along the community parks eastern boundary. Trees should be planted between November and March during the dormant period and protected from rabbits with spiral guards. Planting should be undertaken in an irregular fashion to create a varied edge, and so be of greater value to wildlife. To increase the woodlands nature conservation value some gaps should be left (between 7m to 25m) to provide open spaces and glades within the wood.

5.20 Species should include pedunculate oak *Quercus robur,* ash *Fraxinus excelsior,* and faster growing species such as birch *Betula* sp, and hazel *Corylus avellana.* In areas abutting the wetland areas wet woodland species such as alder *Alnus glutinosa* and willow *Salix* sp should be included.

5.21 Trees and shrubs in rear gardens and other areas of the development area would be planted at approximately 40:60 tree / shrub ratio, at 3m centres and supported by low double stakes. Species should include:

Acer campestre	Field maple
Corylus avellana	Hazel
Craetagus monogyna	Hawthorn
Malus sylvestris	Crab apple
Prunus spinosa	Blackthorn
Rosa canina	Dog rose

Scrub

5.22 Scrub planting is to be incorporated into the parks mosaic with species rich and tussock grassland, and trees. Shrubs will be planted at 300mm centres and will be adequately protected from rabbits. Dead and diseased plants will be replaced in the first five years. All planting will be left to develop untouched for the first five-year period. After this time some thinning may be required and this should be assessed by the site manager. Species will include:

Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Cornus sanguinea	Dogwood
Prunus spinosa	Blackthorn
Rosa canina	Dog rose
Ligustrum vulgare	Wild privet
Ilex aquifolium	Holly

Shrubs and Standard Trees

5.23 Existing hedgerows are to be retained and tree lines created along access roads and footpaths as part of the residential development. This will include new native tree and shrub planting around balancing ponds and play areas.

5.24 Where hedgerows are provided standard trees will also be planted within the canopies. Species included within hedgerow planting include:

Cornus sanguinea	Dogwood	5%
Crataegus monogyna	Hawthorn	50%
Ilex aquifolium `	Holly	5%
Ligustrum vulgare	Wild privet	5%
Rosa canina	Dog rose	5%
Prunus spinosa	Blackthorn	15%
Corylus avellana	Hazel	15%

5.25 Standard trees to be planted as tree lines and approximately every 20m within the hedgerows are to include:

Acer campestre	Field maple

Malus sylvestris	Crab apple
Prunus avium	Wild cherry
Quercus robur	Oak
Sorbus aucuparia	Rowan

5.26 Existing hedgerows will be bordered by buffer strips of tussocky grassland as above that will enhance their foraging and corridor value for bats and birds. Tussocky grassland species will include those as listed at 4.16.

Retained hedgerows will be managed as part of a long term management plan to enhance their value for local wildlife, half of each hedge being cut annually on a rotational basis ensuring that this is done during late winter when the majority of the fruit has been taken by local wildlife. Hedgerows should be at least 1m high, 1m wide, with a cross sectional area of at least $3m^2$. Hedgerows will not be cut during the bird breeding season (March – September inclusive).

Hibernacula

5.27 It is proposed that a number of hibernacula are created within the buffer zone habitats surrounding the ponds. The hibernacula will be constructed out of graded, selected rubble and organic material such as small logs and branches; small crevices will be created between material that will allow areas of refuge for amphibians, invertebrates and small mammals. Hibernacula will vary in length depending on the location, however they will be approximately 2m in width with sloping sides no greater than 45°. Actual gradients and heights should be varied, to provide differing conditions.

5.28 Bird and bat boxes will be erected on retained trees and on selected buildings to provide increased opportunities for use by nesting birds and roosting bats.

6.0 MANAGEMENT PRESCRIPTIONS

Table 1 - Outline Prescriptions

Habitat	Prescription
Species Rich Grassland/Wet Grassland areas	Remove and treat areas currently colonised by invasive species Monitor site for invasive species recolonisation annually and control each spring (strimming, handpulling, and/or spraying) Remove topsoil from improved grassland area, re-profile and add green hay / seed mix Mow once the seeded grassland reaches 100mm, then mow 2-3 times in the first year. For all established grassland mow selected areas once or twice annually during spring and late summer. Allow other species to naturally colonize or introduce through use of green hay. Leave longer unmown grass around hedgerow bases and adjacent to the waters edge of ponds. Mow selected areas once every other year. Remove arisings approximately 48 hours after mowing, these should be placed in a designated area within the site to provide habitat diversity. Allow development of areas of ruderal vegetation; such areas will need to be controlled. Ruderals located in areas required as open grassland should be spot treated with a glyphosate based herbicide. **N.B. Spear thistle, mugwort and other ruderals will provide valuable habitat for invertebrates, where feasible these species should be left to colonise.**
Tussock Grassland	Leave uncut to develop naturally, cut every other year in selected areas and remove arisings after 48 hours.
Marginal & Emergent Vegetation	Ensure marginal vegetation does not engulf the open water, at least 50% of the water will be maintained as open water free from marginal vegetation. If clearance is required only one-third or less of marginal areas should be cleared annually on a rotational basis during autumn, arisings should be left next to the pond for at least 48 hours, before taking to the designated composting area, to allow amphibians and invertebrates to return to the pond.
Scrub	Planting will consist of hawthorn, blackthorn, hazel, holly, dogwood, dog rose and wild privet planted at 300mm centres. All new planting will be adequately protected and fenced from rabbits. Dead and diseased plants will be replaced in the first year. All planting should be left to develop untouched for the first five-year period. After this time some thinning may be required, this should be assessed by the site manager. Scrub will be controlled by annual clearance to prevent encroachment into the grassland. Glyphosate based herbicide should be used on stumps to help prevent re-growth. Any tall vegetation and scrub should be controlled around the water bodies to prevent over shading and build up of leaf litter.

Habitat	Prescription
Native Species Tree Planting	Tree planting using young specimens, less than 1m high, will be undertaken in November – March in accordance with the species mix and densities outlined above. Weed growth around the immediate vicinity of the tree to be treated using a glyphosate based herbicide. All dead and dying specimens to be replaced on a like for like basis for the first five years. However, any plants failing to establish within the first two years will be replaced. Periodic scrub management should ensure that the woodland or scrub does not develop or encroach onto adjacent habitats. Where possible saplings should be hand pulled or if this is not possible cut to stump height and treated with a glyphosate based herbicide.
Hibernacula	The shrub planting on the hibernacula should be controlled when necessary to ensure the vegetation does not encroach into the grassland.
Hedgerows and Standard Trees	Cut half of the hedgerows annually on a rotational basis ensuring that this is during late winter when the majority of the fruit has been taken by local wildlife. Hedgerows will not be cut during heavy frost or during bird breeding season (March – September). Standard trees should be planted along the hedgerows every 20m. These should be predominantly oak with occasional ash, field maple, crab apple, and wild cherry. Standard retained trees will be left unmanaged. If pruning is required any wood taken will be left in habitat piles next to hedgerows and within open grassland.

7.0 BALANCE OF RECREATIONAL USE WITH WILDLIFE INTERESTS

Objective 3

7.1 Balance recreational use of the site with the wildlife interests within the site

7.2 Appropriate pathways will be created to provide defined access routes across the site and out to the wider countryside, reducing the potential for unauthorised desire lines, the build up of litter and nutrient enrichment from dogs in sensitive areas.

7.3 Where considered necessary post and rail fencing will be erected around the perimeter of ponds to prevent access by the general public.

7.4 Information boards will be placed at appropriate locations within the development especially in close proximity to ponds, adjacent to footpaths and at the top of the viewpoint feature within the community park. These will detail the importance of the site and instruct people on how to reduce their impact on the surrounding wildlife.

7.5 Potential nutrient enrichment from dogs will be mitigated for through clear signposting and the frequent provision of dog bins throughout the GI.

8.0 MONITORING AND WORK PROGRAMME

8.1 In order to ensure that the habitats created within the site reach and maintain their maximum value to nature conservation, all habitats should be monitored every two years with some specific surveys being carried out every year.

8.2 Results of this monitoring should be used to inform changes to the management plan, particularly at the end of the initial five-year work programme. The prescriptions provided here should not be set in stone and will be altered if required. The management plan should run for a period of ten years, the work programme will be reviewed at the end of the five year period. Results of this review should be reported to the Ribble Valley Borough Council to inform them of the progress of habitat creation, establishment and maintenance.

8.3 An outline plan is detailed below. Flexibility is essential and managers will have the ability to adjust the regime in consultation with the Steering Group in order to respond promptly to changing circumstances.

8.4 Litter should be removed from the site as part of the general management and maintenance visits.

Table 2 – Five Year Work Programme

Description of works	Years Active with Priority					
	1	2	3	4	5	Post 5 yrs
Management of water bodies						
1. Monitor marginal vegetation extent and remove up to 1/3rd if required.	-	✓	-	✓	-	✓
2. Control over-shading of shrub and tree species surrounding water bodies when appropriate.	-	-	-	-	-	-
3. Monitor siltation of onsite stream and remove obstacles if necessary						
Species Rich and Wet Grassland						
1. Spread green hay and mow grassland in the first year once it grows to 100 mm during late summer/autumn.	✓	-	-	-	-	-
2. If green hay spread fails to increase botanical composition of grassland then repeat spreading or plant plug plants	-	-	✓	-	-	
3. Mow grassland 2-3 times in first year	✓	-	-	-	-	-

Description of works	Years Active with Priority					
4. Mow grassland once or twice annually, leaving longer unmown grass around woodland and hedgerows etc. Mow in spring or late summer in dry conditions.	-	✓	✓	✓	-✓	✓
5. Mow GI pathways 3-4 times a year	✓	✓	✓	✓	✓	✓
6. Remove arisings within 48 hours to a designated composting area.	✓	✓	✓	✓	✓	✓
Tussock Grassland						
1. Leave mostly uncut, cut selected areas every other year in spring or late summer in dry conditions.	-		✓	-	✓	
Hedgerows						
1. Gap up existing hedgerows with native woody species.	✓	-	-	-	-	-
2. Replace dead or dying species on a like for like basis.	-	✓	✓	✓	✓	✓
3. Cut every year, with a maximum of 50% of the hedgerow cut at the same time.	✓	✓	✓	✓	✓	✓
4. Cut in late winter to avoid the bird breeding season, but not during severe frost.	✓	✓	✓	✓	✓	✓
Scrub						
1. Prevent scrub spreading into grassland by annual clearance. Treat stumps where necessary with glyphosate based herbicide to help prevent re-growth.	✓	✓	✓	✓	✓	✓
Tree Planting						
1. Plant young tree species	✓	-	-	-	-	-
2. Treat weed growth around immediate vicinity of tree	✓	✓	✓	✓	✓	-
3. Replace dead or dying species on a like for like basis.	-	✓	✓	✓	✓	✓
4. Prevent encroachment into adjacent habitats.	-	-	-	-	-	✓
Monitoring						

Description of works	Years Active with Priority					
1. Monitor general green infrastructure habitats every two to three years and use results to inform future management, (i.e. if annual scrub clearance is not effective in controlling encroachment; green hay spread has failed to establish etc).	-	-	✓	-	-	✓
2. Monitor for invasive species and treat annually each spring	✓	✓	✓	✓	✓	✓
3. Survey the water bodies annually to check for presence of water vole and crayfish	✓	✓	✓	✓	✓	✓
4. Monitor bat habitats to establish use for foraging and roosting.	-	-	✓	-	✓	✓