Wentworth Estate

Broom Lane, Darfield & Black Lane, Hoyland

BIODIVERSITY OFFSETTING MANAGEMENT PLAN

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FPCR Environment and Design Ltd
Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [F] 01509 674565 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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1.0 INTRODUCTION

1.1 FPCR Environment and Design Ltd were commissioned to undertake a preliminary ecological assessment survey of two plots of arable farmland which was carried out in February (Area A – Black Lane) and July (Area B – Broom Lane) 2020. The remit was to consider options for habitat creation that might be able to deliver biodiversity offsetting to provide mitigation in the form of 'biodiversity units' for mixed commercial and residential development subsequently granted planning permission by Barnsley Metropolitan Borough Council (BMBC) on 9th November 2020 (planning ref. 2020/0647.

1.2 FPCR received a further commission to work in conjunction with the Wentworth Estate to produce a Biodiversity Enhancement Management Plan and liaise with BMBC to secure approval of the plan. This plan set out the basis for the creation and management of prescribed habitats to an agreed condition based on Biodiversity Net Gain (BNG) calculations submitted and agreed as part of the above planning permission. The agreed condition targets and management methods were based on Defra guidance (Natural England, July 2019[1]). In adopting these pre-agreed parameters the content of this Biodiversity Offsetting Management Plan (BOMP) uses the same guidance and through the use of further baseline soils data sets out the detailed proposed scheme of biodiversity enhancement.

1.3 As the Defra guidance is not prescriptive in terms of format, this plan has adopted a tabular format as much as possible. This is based on the need to provide a concise set of instructions that can be easily interpreted by those charged with the responsibility of delivering the management. An effective management plan is one that clearly and concisely shows three things:

- What has to be done;
- How it has to be done; and
- When it has to be done.

1.4 If anyone of these elements is not understood, or not adhered to, management objectives will be jeopardised and the likelihood of reaching the plan objectives will be reduced.

1.5 Monitoring is the fourth element of effective land management. The response of a habitat when prescribed management is implemented can only be predicted; it can very rarely be assured. Plans therefore need to be adaptive in response to what happens when management is implemented, and that response has to be informed by regular monitoring of the habitats and a regular review of the management plan. These elements therefore form an important part of the plan.

1.6 The plan covers a period of 33 years, reflecting the anticipated timescale to achieve the desired state for the habitats and to reflect Defra BNG guidance

[1] Natural England (July 2019) *The Biodiversity Metric 2.0 – auditing and accounting for biodiversity – Technical Supplement (Beta Edition)*

2.0 LEGISLATION

2.1 This section considers legislation potentially relevant to the management of the Site.

Table 1: Potentially relevant legislation

Legislation	Summary	Relevance for Project
Conservation of Habitats and Species Regulations 2017[2]	The Regulations transpose the European Commission Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. They enable the designation and protection of sites for rare and threatened species and habitats. Collectively across the European Union (EU) land area, these European sites form the Natura 2000 coordinated network of protected sites. The Regulations "make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy or trade in the plants listed in Schedule 4 ."[3] However, in some circumstances these otherwise unlawful actions can be made lawful via a licence system.	The Site is located close to the River Dearne (separated from the bank top and associated riparian habitat by a 5m wide flood protection bund of short grassland). The river and associated riparian habitat are potentially suitable to support otter, which is fully protected as a European Protected Species (EPS) under The Regulations. It is not just the animal that is protected; protection includes their breeding sites and resting places.

[2] The Conservation of Habitats and Species Regulations 2017. (SI 1012). London: HMSO. [Online] [Accessed 08/02/2021] http://www.legislation.gov.uk/uksi/2017/1012/contents/made

[3] Joint Nature Conservation Committee. (2018). *The Conservation of Habitats and Species Regulations 2017*. [Online]. [Accessed 08/02/2021]. http://jncc.defra.gov.uk/page-1379

Legislation	Summary	Relevance for Project
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[4]	EU Directive 2000/60/EC - Water Framework Directive (WFD) requires EU Member States to protect and improve their inland and coastal waters. The WFD has seven key aims, with achieving 'good status' for all waters by set target dates a high-ranking priority. This is transposed into UK law in England via this Statutory Instrument. Within England the Environment Agency (EA) is the lead authority for many of the WFD objectives. The water environment is managed via catchments in England and Wales and these are formed by eleven river basin districts, each of which has a River Basin Management Plan (RBMP) which include the ecological statuses of all water bodies and actions needed to meet the objectives set out in The Water Environment Regulations 2017 for their ecological status by set target dates. The regulations require that proposed schemes cause no deterioration to the current ecological status of a water body, or prevents that waterbody from achieving its expected status by set target dates. To ensure compliance any proposed works in and around the water environment must not result in any of the following outcomes: 1. Cause a deterioration in the ecological status/potential of a water body. 2. Prevent a water body from meeting its objective of good ecological status/potential. 3. Prevent or compromise WFD objectives being met in other water bodies. 4. Cause failure to meet good groundwater status, or result in a deterioration of groundwater status. 5. Prevent the implementation of mitigation measures which define the hydromorphological designation of heavily modified water bodies. This requires a Water Framework Directive Risk Assessment (WFDRA)[5] to be undertaken.	None of the proposed management involves any direct impact on the River Dearne. The southern half of Area B lies within a flood storage zone, excavations proposed in this area are not considered likely to impact the flood storage capacity of this land. Furthermore receptors identified in the WFDRA for the River Dearne will not be affected by the proposals therefore a WFDRA is not required.

[4] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. (SI 407). London: The Stationary Office Ltd. [Online]. [Accessed 08/02/2021]. http://www.legislation.gov.uk/uksi/2017/407/contents/made

[5] Environment Agency. (2016). *Water Framework Directive risk assessment – How to assess the risk of your activity*. [Online]. [Accessed 08/02/2021]. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10445.pdf

Legislation	Summary	Relevance for Project
The Wildlife and Countryside Act 1981 (as amended).	This Act implements European legislation; the Bern Convention and the Birds Directive (now superseded by Directive 2009/147/EC). In very brief summary, the Act: • Provides protection for most wild birds from intentional killing and injury and protection of their nests and eggs; • Protects other animals listed in Schedule 5 from being intentionally killed, injured or taken, and prohibits interference of their places of shelter and intentional disturbance of the animals whilst they are in these places; • Makes it an offence to release animals listed in Schedule 9; • Makes it an offence to plant, or cause to grow in the wild plants listed in Schedule 9; and • Provides legislation concerning Sites of Special Scientific Interest (SSSI).	None of the proposed habitat creation/management involves methods beyond normal agricultural practice (e.g. ploughing, harrowing, cutting for silage and hay crops). Consequently, no mitigation in relation to the Act is required.
Badgers Act 1992	Unless under the provisions of a Licence allowing otherwise, this Act makes it an offence to take, injure, sell, possess, kill or ill-treat a badger. Also, damage, destruction or any disturbance of a sett is also an offence.	No signs of badger including existing setts have been identified within the land proposed for habitat creation or its vicinities so no mitigation is required for the proposed works.
Environmental Permits	Work on or near a main river or in a flood plain is regulated under Environmental Permits (formerly Flood Defence Consents) and it is an offence to undertake such works without obtaining a permit.	None of the proposed management involves any direct impact on the River Dearne. The requirements set out in the statutory guidance *SR2015 No 35: excavating a wetland or pond in a main river floodplain*[6] should be followed.

[6] Environment Agency Statutory Guidance (2016). [Online]. [Accessed 16/03/2021]. https://www.gov.uk/government/publications/sr2015-no35-excavating-a-wetland-or-pond-in-a-main-river-floodplain.

3.0 PLANNING POLICY & OTHER INITIATIVES

3.1 This section considers planning policies and other initiatives potentially relevant to the project.

Table 2: Potentially relevant planning policies & other initiatives

Planning Policy or Initiative	Summary	Relevance for Project
National Planning Policy Framework (NPPF)[7]	The NPPF sets out the UK Government's planning policies for England and how they expect these to be applied by Local Planning Authorities (LPA). A presumption in favour of sustainable development is embedded within the NPPF. To achieve this the NPPF considers that the planning system has three over-arching, interdependent objectives: economic, social and environmental. Supporting development proposals whose primary objective is to conserve or enhance biodiversity is one example of applying a presumption in favour of sustainable development. So is encouragement for proposals which would secure measurable net gains for biodiversity.	All of the proposed work is essentially agricultural operations within areas currently under normal agricultural management. This would not require planning permission.
Barnsley Local Plan January 2019[8]	Sets out local policies of Barnsley Metropolitan Borough Council, those that are potentially relevant to the project include: • Policy GI1 Green Infrastructure • Policy GS1 Green Space • Policy BIO1 Biodiversity and Geodiversity • Policy CC4 Sustainable Drainage Systems (SuDS)	All of the proposed work is essentially agricultural operations within areas currently under normal agricultural management. This would not require planning permission.

[7] Ministry of Housing, Communities Local Government. (2019). *National Planning Policy Framework.* [Online]. [Accessed 08/02/2021]. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf

[8] Barnsley Metropolitan Borough Council (2019) *Barnsley Local Plan*. [Online] [accessed 08/02/2021]. https://www.barnsley.gov.uk/media/17249/local-plan-adopted.pdf

Planning Policy or Initiative	Summary	Relevance for Project
Supplementary Planning Document – Biodiversity and Geodiversity May 2019[9]	Provides additional detail for policies GI1 (Green Infrastructure) and BIO1 (Biodiversity and Geodiversity) listed above including mapping policy areas.	The policy and its associated mapping provide guidance regarding the appropriateness of habitat creation at the sites proposed. The habitats proposed have been agreed in consultation with BMBC.
Supplementary Planning Document – Trees and Hedgerows May 2019[10]	Provides additional detail for policy BIO1 (Biodiversity and Geodiversity) including protection measures for hedgerows.	Guidance on protection of hedgerows. Proposed works will not impact existing adjacent hedgerows beyond what would be expected under normal agricultural management to maintain features.
Barnsley Metropolitan Borough Council Local Biodiversity Action Plan	This Local Biodiversity Action Plan (LBAP) sets out objectives and targets for Barnsley's local contribution to the UK Government's national biodiversity strategy for achieving the Aichi Biodiversity Targets. These objectives and targets form a core element of the 52 action plans for species and habitats.	The LBAP targets include creation of neutral grassland under the 'Lowland Meadow' Habitat Action Plan (HAP) and the LBAP also has targets for hedgerows and ponds. Contributing to these aims is an objective of this Biodiversity Offsetting Project. The habitats proposed have been agreed in consultation with BMBC.

[9] Barnsley Metropolitan Borough Council (2019) *Barnsley Local Plan – Supplementary Planning Document – Biodiversity and Geodiversity*. [Online] [accessed 08/02/2021]. https://www.barnsley.gov.uk/media/15708/biodiversity-and-geodiversity-spd.pdf

[10] Barnsley Metropolitan Borough Council (2019) *Barnsley Local Plan – Supplementary Planning Document – Trees and Hedgerows*. [Online] [accessed 08/02/2021]. https://www.barnsley.gov.uk/media/15720/trees-and-hedgrows-spd.pdf

4.0 DESCRIPTION

General Information

Location and site boundaries

4.1 Area A is located on the eastern side of the M1 Motorway corridor comprising a single arable compartment between the M1 and Bell Ground (wood) in farmland west of the town of Hoyland; Area B is located east of the River Dearne comprising an arable field between the river corridor and a dismantled railway with Broom Lane forming its southern boundary in farmland south east of the town of Darfield. Figure 1 and Figure 2 show the boundary of each area A and B and lie within the parishes of Tankersley and Billingley respectively.

Tenure

4.2 Tenure of the land areas A and B (as shown in Table 3) is 'In-hand' for the duration of the management period.

Table 3: Land tenure

Field name	Field Number	Tenure	Term
Black Lane	NG 4416	In-hand	Duration
Broomhill	NG 1567	In-hand	Duration

Relationship with other plans and strategies

4.3 Area A and B fall within the area encompassed by Barnsley Local Biodiversity Action Plan. This has objectives and targets highly relevant to this project.

Management / organisational structure

4.4 Management of the Site currently, and in the future, falls within the remit of the wider management of Wentworth Estate land.

Environmental Information

Physical

Climate

4.5 The nearest source of long-term weather information is from the Met Office weather station at the University of Sheffield campus (Weston Park) approximately 16 km to the south west areas A and B. The station annual averages for the period 1981-2010[11] show an oceanic climate characteristic of the Midlands with:

- 131 days of rain/year, resulting in an average annual rainfall of 834.6 mm;

[11] Met Office [online] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcqzwq04e [accessed 04/02/2021]

- Average temperatures of 21.2ºC during the hottest month (July) and 6.8ºC during the coldest month (January);
- Average annual hours of sunshine of 1,444 hours with July the sunniest month with an average of 199.5 hours of sun; and
- Average of 33.8 days of air frost, with February the frostiest month with an average of 9 days of air frost.

Geology & Geomorphology

4.6 Area B is located on Pennine Middle Coal Measures Formation – mudstone, siltstone and sandstone. The southern extent of Area B (south of the bisecting access track) is overlaid with Alluvium – Clay, Silt, Sand and Gravel.

4.7 All but the north eastern edge of Area A is located on Barnsley Rock – Sandstone within the parent rock of Pennine Middle Coal Measures Formation (mudstone, siltstone and sandstone) which covers the north eastern tip of Area A (not otherwise covered by sandstone).

4.8 Geology data was taken from British Geological Survey[12].

Soils/substrate

4.9 The Soilscapes web-tool[13] contains a simplified soils data set which identifies three soilscapes within the project area:

Covering Area A:

- Slowly permeable seasonally wet acid loamy and clayey soils

Covering Area B:

- Freely draining slightly acid loamy soils (north of access track)
- Loamy and clayey floodplain soils with naturally high groundwater (south of access track)

4.10 SOYL were commissioned to undertake a soil survey within the project areas. The results of their survey are summarised in Table 4 and 5 below.

Table 4: Soil organic matter

Field Name	OM (LOI) % w/w	Index	OM (Dumas) %	Index
Black Lane (Area A)	6.2	normal	5.8	good
Broomhill (Area B)	5.5	normal	5.4	good

The Dumas method measures the CO2 given off from a soil sample after combusting and is a measure of soil carbon, which is a fixed proportion of organic matter content. LOI (Loss On Ignition) is provided here to allow comparison with previous analysis and for use with benchmarking schemes that use this method.

[12] British 6Geological Society. (2019). Geology of Britain viewer. [Online]. [Accessed 04/02.2021]. http://mapapps.b7gs.ac.uk/geologyofbritain/home.html

[13] Cranfield S8oil and Agrifood Institute. (2019). Soilscapes web application. [Online], [Accessed 04/02/2021] http://www.landis.o9rg.uk/soilscapes/

4.11 The northern extent of Area A (Black Lane) supports clay soil (sample 8) while the southern 2/3 of the field supports a silty clay (samples 9 & 10).

4.12 The southern extent of Area B (Broomhill Lane), south of the bisecting access track supports clay soils (samples 5-7) while the northern half of the field supports a greater proportion sandy and loamy soils and less clay (samples 1-4).

4.13 Across both plots of land the soils show high nutrient levels with a phosphate (P) indices of 2-3.

Table 5: Soil analysis – nutrients

Sample area	Soil texture	pH	Total Nitrogen (%)	Sand 2.00-0.063mm	Silt 0.063-0.002 mm	Clay <0.002mm	MAFF nutrient index		
							P	K	Mg
Broomhill (Area B)									
1	Sandy clay loam	7.0	0.208	55	24	21	3	2+	2
2	Sandy clay loam	6.9	0.203	55	24	21	3	2+	2
3	Clay loam	7.0	0.224	37	34	29	2	3	2
4	Clay loam	6.8	0.218	34	36	30	2	3	3
5	Clay	7.2	0.246	18	41	41	2	3	3
6	Clay	7.3	0.285	15	38	47	2	2+	4
7	Clay	7.1	0.292	12	41	47	2	3	3
Black Lane (Area A)									
8	Clay	6.7	0.215	16	43	41	2	2+	3
9	Silty clay	6.6	0.179	17	46	37	3	3	2
10	Silty clay	7.0	0.177	15	48	37	2	2-	2

Topography

4.14 The OS 1:25,000 series shows the Black Lane compartment (Area A) rising from around 125m above sea level in the south to 130m just before the northern field boundary. The Broomhill Lane compartment (Area B) lies within the River Dearne flood plain with the field centre 25m above sea level rising to 35m at the northern boundary (the boundary with Broomhill Lane being the lowest point).

Hydrology/drainage

4.15 Approximately half of Area B (4 ha) is within the Environment Agency's Flood Zone 2 (including all land south of the central access track and approximately 1/3 of land to its north) and the land south of the track is also within a flood storage area. Flood Zone 2 is defined as "*Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding…*"[14]

4.16 Area A is not within any flood zone areas.

[14] Ministry of Housing, Communities & Local Government. (2014). *Flood risk and coastal change – guidance*. [Online]. [Accessed 05/02/2021]. https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-zone-and-flood-risk-tables

Biological

Non-statutory Designations

4.17 Neither plot lies within any biological designation.

Habitats/communities

4.18 All the land to be utilised for habitat creation is currently cultivated for arable crops. The boundary hedgerows described below will be subject to tradition management to maximise biodiversity but otherwise will be unaffected by the habitat creation scheme (hence exclusion from Table 6).

Summary Description – Area A (Black Lane)

4.19 This comprised approximately 1.2 hectares of heavily cultivated arable land bordered by broadleaved woodland (southern and eastern boundaries), bramble *Rubus fruticosus* scrub (northern and north-western boundaries) and a trimmed native hedge at the south-western boundary supporting hazel *Corylus avellana*, elm *Ulmus sp*. and sycamore *Acer pseudoplatanus*. It was a trimmed trackside hedge approximately 3m high and 2.5m wide running adjacent a public footpath. The woodland boundaries supported a margin that included bramble and nettles overgrowing a collapsed drystone wall. A further narrow margin of bramble was supported at the northern boundary.

Summary Description – Area B (Broomhill Lane)

4.20 This comprised approximately 8 hectares of heavily cultivated arable land bisected by a vehicular track of bare earth. The south-eastern end of the field supported a small temporary pool of shallow standing water colonised by a scattering of plants indicative of periodic inundation including rushes *Juncus sp*. Adjacent the southern extent of the western arable boundary (offsite) was a flood protection bund of short mown improved grassland dominated by perennial rye-grass *Lolium perenne.* The north western boundary was defined by a line of Leylandii *Cuprocyparis leylandii* trees bordering a sewerage works. The southern boundary supported a bank of coarse grasses and herbs dominated by false oat-grass *Arrhenatherum elatius* and common nettle *Urtica dioica* adjacent a metalled road (Broomhill Lane).

4.21 Most of the northern arable boundary was also adjacent to a strip of coarse grassland forming the margin with established scrub and dominated by false oat-grass. The northern boundary at its western extent was bounded by an unmanaged garden hedgerow of hawthorn *Crataegus monogyna* and garden privet *Ligustrum ovalifolium* with a coarse grassland margin of false oat-grass. The eastern boundary supported a further trimmed hedgerow of hawthorn approximately 2m high and 2m wide.

Table 1: Habitat descriptions and evaluation

FEATURE & LOCATION	Summary Description	Condition Assessment	Ecological Value
Area A (Black Lane): arable compartment	Heavily cultivated arable	Automatically classified as N/A - Agricultural	Negligible
Area B (Broomhill Lane): arable compartment	Heavily cultivated arable	Automatically classified as N/A - Agricultural	Negligible

Species

Mammals

4.22 Brown long-eared bats *Plecotus auritus* have been recorded in association with a barn approximately 230m west of Area A, beyond the M1 motorway corridor.

4.23 Hedgehog *Erinaceus europaeus* have been recorded in association with existing residential development of Hoyland and Darfield. Water vole *Arvicola amphibius* and hedgehog have been recorded in Old Moor reserve south of Area B.

Birds

4.24 Farmland birds including yellowhammer *Emberiza citrinella*, skylark *Alauda arvensis*, lapwing *Vanellus vanellus*, house sparrow *Passer domesticus* and song thrush *Turdus philomelos* have been recorded in the vicinity of Area A.

4.25 Species recorded at Old Moor reserve approximately 500m from Area B include: sedge warbler *Acrocephalus schoenobaenus*, reed warbler *A. scirpaceus*, skylark *Alauda arvensis*, common sandpiper *Actitis hypoleucos*, lesser redpoll *Acanthis cabaret* and meadow pipit *Anthus pratensis*.

Amphibians

4.26 Historical records exist for great crested newts (GCN) north of Area A at Tankersley Common where no permanent ponds are now present. Aquatic survey of ponds in the vicinity of Area A during 2020 recorded no GCN.

4.27 Common amphibians including frogs and toads have been recorded in Old Moor reserve south of Area B.

Reptiles

4.28 Grass snake *Natrix helvetica* has been recorded at Potter Holes Plantation approximately 1km from Area A and separated by the M1 Motorway corridor.

Invertebrates

4.29 White-letter hairstreak *Satyrium w-album* have been recorded in Bell Ground (wood) adjacent Area A at Black Lane. Records of dingy skipper *Erynnis tages* have been noted approximately 500m east of Area A, beyond Bell Ground (wood).

5.0 EVALUATION OF BASELINE CONDITIONS

5.1 The habitats within the project area are of negligible ecological value and heavily cultivated arable is classified as N/A – Agriculture condition so there is significant potential for habitat creation to raise the lands biodiversity value.

5.2 The loss of species-rich neutral grassland within the UK over the past half-century has been well-documented, as summarised within the Barnsley Local Biodiversity Action Plan[15] (LBAP) 'Habitat Action Plan Lowland Meadow'. The Habitat Action Plan (HAP) proposes action to create new areas of lowland meadow in partnership with landowners. The Barnsley LBAP is currently under revision and this is likely to see new targets set. Creation of 1.7 Ha of neutral species-rich grassland would make a valuable contribution to current and predicted targets within the HAP.

5.3 The loss of hedgerows is also well-recorded and summarised in the Barnsley LBAP 'Habitat Action Plan Hedgerows'. Actions proposed under the plan include securing favourable management plans for all ancient and species-rich hedgerows and survey and monitoring of all known white-letter hairstreak sites and potential new locations to undertake appropriate management. While there is currently no HAP for scrub the habitat is considered to provide many of the biodiversity benefits of hedgerows and the creation of 4.76 Ha of species diverse scrub would provide valuable benefits to wildlife.

5.4 The Barnsley LBAP 'Habitat Action Plan Ponds' accords significant value to standing water habitats and current action undertaken under this plan includes creation of new ponds at Old Moor reserve close to Area B. Proposed actions includes seeking opportunities to create new areas of standing water that can be managed to promote biodiversity and link with the Million Ponds Project being run by Pond Conservation and Natural England. The creation of 0.21 Ha of new ponds and ditches cross both sites will make a valuable contribution to the HAP targets.

5.5 Areas A and B are located immediately adjacent to established broadleaved woodland (Bell Ground at Black Lane and woodland of the disused railway at Broomhill Lane) and the creation of neutral grassland, scrub and wetland would complement the current ecological value of these local habitats. The Land at Broomhill Lane (Area B) also lies within the River Dearne floodplain close by established wetland sites including Old Moor reserve and Wombwell Ings.

5.6 Both areas A and B are within the Deane Valley Green Heart 'Nature Improvement Area' set out in the Barnsley Local Plan SPD Biodiversity and Geodiversity to target ecological restoration at a landscape scale to improve biodiversity. The proposals for these areas aim to maximise the aspiration within the Lawton Review calling for a 'Bigger, Better, More and more Joined-up' approach to nature conservation sites. The range of habitat creation proposed is complimentary to those present locally and within the Nature Improvement Area. As a result, they support the delivery of Nature Recovery Networks; part of the government's landmark Environment Bill.

[15] Barnsley Biodiversity Trust (2009) *Barnsley Biodiversity Action Plan*. Barnsley Biodiversity Trust.

6.0 OBJECTIVES

Table 7: Objectives

FEATURE & LOCATION	OBJECTIVE	RATIONALE	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED
Area A: 1.17 Ha. of existing cultivated arable **Scrub Creation**	To create native scrub that meets the definition of "Heathland and scrub – Mixed scrub" within the Defra guidance (Defra, July 2019) with a condition assessment of 'Good', as determined by survey in accordance with the Defra UK Habitats guidance.	The cultivated arable is currently of negligible ecological value. The LBAP 'Hedgerows' HAP proposes action to securing favourable management for species-rich hedges. Creation of native scrub would contribute to the broad objectives of the LBAP by providing biodiversity value comparable to that of hedgerows.	**All** of the following criteria are met: 1. At least three woody species, with no one species comprising more than 75% cover. 2. A good age range – a mixture of seedling, saplings, young shrubs and mature shrubs. 3. Pernicious weeds and invasive species make up <5% of ground cover. 4. Well-developed edge with ungrazed tall herbs. 5. Many clearings and glades within the scrub.

FEATURE & LOCATION	OBJECTIVE	RATIONALE	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED
2. Area B: 1.7 Ha. of existing cultivated arable habitat **Grassland Creation**	To create species-rich neutral grassland that meets the definition of "Grassland – Other neutral" within the Defra guidance (Defra, July 2019) with a condition assessment of 'Good', as determined by survey in accordance with the Defra UK Habitats guidance and data analysis methodologies[16].	The cultivated arable is currently of negligible ecological value. The LBAP 'Lowland Meadow' HAP proposes action to create new areas of lowland meadow in partnership with landowners. Creation of neutral grassland would contribute to this objective.	**All** of the following criteria are met: 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. The appearance and composition of the vegetation on site should very closely match the characteristics for the specific Priority Habitat [i.e as described by either the Phase 1 Habitat Classification or the UK Habitat Classification], with species typical of the habitat representing a significant majority of the vegetation. 3. Total cover of wildflowers and sedges >30%, including[A]: Oxeye daisy, meadow vetchling, rough hawkbit, black knapweed, autumn hawkbit, common birds-foot trefoil, ladies bedstraw, glaucous sedge, red clover, selfheal, cowslip (excluding white clover, creeping buttercup and injurious weeds[B]). 4. Undesirable species[B] and physical damage <5% cover. 5. Cover of bare ground >10% (including localised areas, for example, rabbit warrens). 6. Cover of bracken <20% and scrub and bramble <5%.

[16] The proposed monitoring survey work will be undertaken based on recording of criteria in the *UK Habitat Classification Users Manual* and Field Key (Butcher, B. Carey, P. Edmonds, R. Norton, L. and Treweek, J. 2020) and consistent with the methods followed to inform the BIA calculations and uses '*Grassland – Other neutral'* habitat type, with the target condition set at 'Good'.

FEATURE & LOCATION	OBJECTIVE	RATIONALE	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED
3. Area B: 3.59 Ha. of existing cultivated arable habitat **Scrub Creation**	To create native scrub that meets the definition of "Heathland and scrub – Mixed scrub" within the Defra guidance (Defra, July 2019) with a condition assessment of 'Good', as determined by survey in accordance with the Defra UK Habitats guidance.	The cultivated arable is currently of negligible ecological value. The LBAP 'Hedgerows' HAP proposes action to securing favourable management for species-rich hedges. Creation of native scrub would contribute to the broad objectives of the LBAP by providing biodiversity value comparable to that of hedgerows.	**All** of the following criteria are met: 1. At least three woody species, with no one species comprising more than 75% cover 2. 2. A good age range – a mixture of seedling, saplings, young shrubs and mature shrubs. 3. Pernicious weeds and invasive species make up <5% of ground cover. 4. Well developed edge with ungrazed tall herbs 5. Many clearings and glades within the scrub.
4. Area B: 0.15 Ha. of cultivated arable **Pond Creation**	To create ponds that meet the definition of "Lakes - Ponds" within the Defra guidance (Defra, July 2019) with a condition assessment of 'Good', as determined by survey in accordance with the Defra UK Habitats guidance.	The cultivated arable is currently of negligible ecological value. The LBAP 'Habitat Action Plan Ponds' targets action to create new areas of standing water. Creating this habitat will contribute to the LBAP objective.	**All** of the following criteria are met: 1. Good water quality, with clear water (substrate can be seen) and no obvious sign of pollution in the water body. 2. Non-woodland ponds should be dominated by plants, be they submerged or floating (note dominance of duckweed is a sign of eutrophication). 3. Not shaded more than 50% 4. Many ponds will be fishless, those which naturally contain fish should not be stocked and should contain a native fish assemblage. 5. Ponds should not be artificially connected to other water bodies, e.g. ditches. 6. Non-native species (details in table 8) should be absent 7. Less than 10% of the pond should be covered with duckweed or filamentous algae.

FEATURE & LOCATION	OBJECTIVE	RATIONALE	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED
5. Area B: 0.06 Ha. of cultivated arable **Ditch Creation**	To create ditch habitat that meets the definition of "Lakes - Ditches" within the Defra guidance (Defra, July 2019) with a condition assessment of 'Good', as determined by survey in accordance with the Defra UK Habitats guidance.	The cultivated arable is currently of negligible ecological value. The LBAP 'Habitat Action Plan Ponds' targets action to create new areas of standing water. Creating this habitat will contribute to the LBAP objective.	**All** of the following criteria are met: 1. Good water quality, with clear water (substrate can be seen) and no obvious sign of pollution in the water body. 2. Clear water dominated by plants, be they submerged or floating (dominance of duckweed is a sign of eutrophication). 3. A range of submerged and floating leaved plants should be present. As a guide more than 10 species of emergent, floating or submerged species in a 20 m ditch length. 4. A marginal fringe of emergent vegetation should be present. 5. The water body should not be impacted by use of the riparian land. 6. If a fish assemblage is present it should comprise of a range of native species and the assemblage should not reach an excessive biomass or be overly dominated by benthivorous or zooplanktivorous fish. 7. Sufficient water levels should be maintained; as a guide a minimum summer depth of approximately 50 cm in minor ditches and 1 m in main drains and linear waterbody should be maintained. 8. Less than 10% of the ditch or linear waterbody should be heavily shaded. 9. Non-native species (details in table 8) should be absent 10. Less than 10% of the ditch should be covered with duckweed or filamentous algae.

[A] These species are FEP Manual "Lowland Meadows – BAP habitat, wildflower indicator species" considered likely to be present in neutral grasslands in this part of Yorkshire.

[B] 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*.

7.0 ACTION PLAN

Table 8: Outline action plan

FEATURE & LOCATION	OUTLINE MANAGEMENT TO ACHIEVE OBJECTIVES	OUTLINE MANAGEMENT TO ACHIEVE OBJECTIVE – LONG-TERM MANAGEMENT
Scrub creation		
1. Cultivated arable (Area A 1.17 Ha.) **3. Cultivated arable (Area B 3.59 Ha.)**	a) Following harvest of arable crops no further fertilizer will be applied. Some targeted use of herbicides may be required. b) Substrate will be ploughed to bury any stubble/weed growth. The soil will then be harrowed to create an even bed. c) Planting native scrub in naturalistic pattern including gaps for glades/rides/clearings (covering 80-90% of total area). d) Sow wildflower/grass mix (following scrub planting into prepared bed). e) Infill plant scrub. f) Long-term management as native scrub.	Manage as native scrub: • No fertiliser inputs; • Regular management to achieve varied structure/species composition, tall herb edge free of scrub growth, wildflower/grass glades and rides.
Neutral grassland creation		
2. Cultivated arable (Area B 1.7 Ha.)	a) Sowing of spring cereal crop with no fertilizer or herbicide applied – to deplete soil nutrients b) Following harvest of arable crops no further will be applied. Some targeted use of herbicides may be required. c) Create suitable conditions for over-sowing with wildflowers d) Introduce wildflower/grass seed mix. e) Appropriate management to reduce cover of/remove pernicious weeds. f) Long-term management to promote species-rich grassland.	No fertilizer inputs from 2021 onward. Following autumn harvest of cereals and sowing of wildflower grassland manage as lowland meadow: • No fertilizer inputs. • Annual mowing and removal of arisings.
Pond and ditch creation		

FEATURE & LOCATION	OUTLINE MANAGEMENT TO ACHIEVE OBJECTIVES	OUTLINE MANAGEMENT TO ACHIEVE OBJECTIVE – LONG-TERM MANAGEMENT
4. Cultivated arable (Area B 0.15 Ha.)	a) Digging series of ponds with varied profiles and sinuous margins in south of arable compartment. b) Planting with native emergent and aquatic species. c) Long-term management to maintain open water with good water quality.	Management as farm ponds not connected to other waterbodies: • Periodic vegetation clearance • Monitoring of water quality
5. Cultivated arable (Area B 0.06 Ha.)	a) Digging 200m ditch (3m wide and 2m deep) with shallow profile in south of arable compartment. b) Planting with native emergent and aquatic species. c) Long-term management to maintain open water free of excessive fish biomass.	Management as unconnected ditch: • Periodic vegetation clearance • Monitoring of fish populations/periodic removal

Table 9: Detailed action plan and monitoring

FEATURE & LOCATION	DETAILED MANAGEMENT TO ACHIEVE OBJECTIVES	MONITORING
Scrub		
1. Cultivated arable (Area A 1.17 Ha.)	a) Scrub creation i) Following harvest of arable crops no further fertilizer will be applied.	a) Increase shrub species diversity

3. Cultivated arable (Area B 3.59 Ha.)	ii) Substrate will be ploughed to bury any stubble/weed growth. The soil will then be harrowed to create an even bed. iii) Native scrub (refer to scrub planting mix Appendix A) planted at a density of 1600 whip per ha between November and March in naturalistic pattern including gaps for glades,/rides/clearings (covering 80-90% of total area) and protected from rabbits with spiral guards as conditions on site require. iv) Scrub planting will be designed to create a range of clearings, glades and rides throughout the planting in order to create significant areas of edge habitats and structural diversity. v) Following scrub planting sown prepared bed with Emorsgate EM3 Special General Purpose Meadow Mixture. <u>b) Management - scrub</u> i) Monitoring and infill planting into gaps to replace any dead or diseased specimens during establishment (years 1 to 5) ii) Trimming following establishment period (from year 5) including maintenance of a sinuous edge with a graded margin down to field layer (tapering edge from canopy height to 20cm). iii) Selective thinning of some dense stands to allow light to reach the ground and promote regeneration of seedlings and saplings (from year 5) iv) Selective clearing of scrub edge (roughly 1/3 to 1/5 every 2-3 years) down to ground to reduce dominance of species such as blackthorn and hawthorn and promote regeneration of young shrubs/herb edge. v) Annual mowing of herb/grass margin at scrub edge to maintain herb margin free of scrub growth (from year 1). <u>d) Management – grassland glades/rides</u> i) Regular mowing of grassland in the first year to a height of 40-60mm is recommended to control annual weeds and balance growth of grasses and wildflowers (removing arisings).	Where monitoring shows a minimum of three shrub species are not present throughout each discrete stand (or 10mx10m area) or single species comprise over 75% of cover: i) Selective clearance of scrub edge to reduce dominance of species such as blackthorn, hawthorn and bramble. ii) Selective thinning of some dense stands to allow light to reach the ground and promote regeneration of seedlings and saplings. iii) Planting of additional shrub species as necessary. <u>b) Control of any non-native invasive species</u> i) Where periodic monitoring records presence undertake mechanical removal/us herbicide as appropriate and remove all cut material from site. ii) Seek advice from specialist contractor as necessary. <u>c) Grassland monitoring</u> i) Tie-in monitoring and management with prescriptions for neutral grassland below to maximise wildflower cover where appropriate (not conflicting with maximising scrub condition).

FEATURE & LOCATION	DETAILED MANAGEMENT TO ACHIEVE OBJECTIVES	MONITORING
	ii) Dig out or spot treat pernicious weeds as necessary. iii) Following establishment mow after flowering in late July or August to around 50mm, removing arisings after they have dried (around 48 hours) to reduce soil nutrients.	

Neutral grassland		
2. Cultivated arable (Area B 1.7 Ha.)	a) Nutrient stripping i) sow spring crop of cereals with no applications of fertilizer or lime. Apply herbicide as necessary to control weeds ii) harvest in autumn prior to grassland creation in same month b) Grassland creation i) Cease all applications of organic or inorganic fertiliser, or lime and herbicide. ii) Ground preparation: harrowing and rolling to create firm seed bed. iii) Sowing Emorsgate EM3 Special Purpose Meadow Mix at rate of 40kg/ha, 4g/m² in late spring/ early autumn, avoiding frosts. iv) Regular mowing in the first year to a height of 40-60mm is recommended to control annual weeds and balance growth of grasses and wildflowers (removing arisings). v) Dig out or spot treat pernicious weeds as necessary. c) Management. i) Following establishment mow after flowering in July or August to around 50mm, removing arisings after they have dried (around 48 hours) to reduce soil nutrients. ii) Mow re-growth in late autumn/winter and again in spring if needed (to around 50mm) to remove excess growth and take away arisings. iii) Suspend cutting each year from mid-spring until after flowering in late summer and once established cutting to be reduced to a maximum of 2 cuts per year.	a) Reduce competitiveness of grasses Where excessive rye-grass cover (over 25%) persists by Year 3: i) after the Aug/Sept cut chain harrow the grassland three times in immediate succession and in a different direction each time. ii) Broadcast yellow rattle seed at a rate of 2.5kg/ha, then roll immediately with a flat roller. iv) If there is sufficient grass growth following sowing, take another cut before the end of year removing arisings. v) For two successive years following yellow rattle sowing take a hay crop at the first suitable opportunity after yellow rattle has set seed. b) Increase wildflower germination Where monitoring shows cover of wildflowers remains below 30% by year 8: i) Year 8, immediately areas after Aug/Sept cut, chain harrow the grassland three times in succession and in different direction each time. ii) Broadcast bespoke wildflower seed mix, the composition of which based on target indicator species (excluding yellow rattle) as detailed in Table 7 or spread green hay from local source (where available) in Sept.

Ponds and ditches		
4. Cultivated arable (Area B 0.15 Ha.)	a) Pond creation i) Dig 1500m^2 pond (or series of ponds totalling 1500m^2) in south on arable compartment. ii) Create sinuous margins and sloping sides (graded profile between 45^o and 20^o) to maximise niches for wildlife and opportunities for emergent plants. iii) Create depths of 1.5 to 2m (over some portion of each feature) sufficient to provide some permanent water and line. iv) Plant native emergent species: flag iris, marsh marigold, common club-rush, branched bur-reed, common reed (locally sourced where available), leaving bare areas for natural regeneration. v) Plant submerged/floating aquatics: common water starwort, spiked water milfoil, broad-leaved pondweed (locally sourced where available). b) Management i) Cut and remove emergent and floating/submerged vegetation 1/3 each year on rotation (Sept/Oct.) to maintain 30-40% open water. ii) leave arising on bankside to 48hrs-2 weeks before removing to minimise harm to invertebrate fauna.	a) Control of woody vegetation and shade i) Monitoring and removal every three years within 10m of pond edge to keep shade cover below 50%. b) Control of non-native invasive plants i) Monitor (bankside and open water) for non-native flora[D] and treat/remove as necessary. ii) Remove excessive growth of filamentous algae or duckweed (covering >10% of water in successive years). c) Control of fish / non-native fauna i) Annual monitoring and removal of introduced fish or other fauna[E]. d) Monitoring of water quality i) Visual inspection of water for evidence of eutrophication such as nutrient slick or algae. ii) Remedial action including use of submerged barley bales removed periodically to reduce nutrient build-up.

5. Cultivated arable (Area B 0.06 Ha.)	a) Ditch creation i) Dig 200m long x 3m wide ditch at southern boundary of arable compartment adjacent Broomhill Lane (covering 600m^2) with depths of 2m and shallow 45^o profile on northern bank and line. ii) Not connected with another waterbody. iii) Plant native emergent/aquatic species: flag iris, brooklime, arrowhead, frogbit, branched bur-reed, common reed, common water starwort, broad-leaved pondweed and whorled water milfoil (locally sourced where available), to provide 10 different species per 20m of ditch. b) Management i) Cut and remove emergent and floating/submerged vegetation 1/3 each year on rotation (Sept/Oct.) to maintain 30-50% open water. ii) leave arising on bankside to 48hrs-2 weeks before removing to minimise harm to invertebrate fauna.	a) Control of woody vegetation and shade i) Monitoring and removal every three years within 10m of pond edge to keep shade cover below 50%. b) Control of non-native invasive plants i) Monitor (bankside and open water) for non-native flora[D] and treat/remove as necessary. ii) Remove excessive growth of filamentous algae or duckweed (covering >10% of water in successive years). c) Control of fish / non-native fauna i) Annual monitoring and removal of introduced fish or other fauna[E]. d) Monitoring of water quality i) Visual inspection of water for evidence of eutrophication such as nutrient slick or algae. ii) Remedial action including use of submerged barley bales removed periodically to reduce nutrient build-up.

[C] At this growth stage the crop will have maximum uptake of nutrients. In the fifth year of management this could involve four to five cuts. In Years 6 and 7 the number of cuts is likely to decline as fertility levels are reduced.

[D] Any non-native species. Frequently observed non-native plant species include water fern, Australian swamp stonecrop parrot's feather, floating pennywort, Japanese knotweed and giant hogweed (on the banks).

[E] Frequently occurring non-native animals include signal crayfish, zebra mussels, killer and demon shrimp and carp.

8.0 MONITORING

8.1 As discussed in para 1.5 monitoring is an integral element of any management plan and forms part of Table 9 and 10. Table 9 summarises the monitoring in terms of what needs to be monitored over the management period.

Table 10: Annual monitoring requirements

Location	Monitoring Item	Year (Year 1 =2021 – Year 15 =2035)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16-30
Scrub																	
Area A & B	Monitor species composition and proportion of edge habitat (including grassed glades)	✓		✓		✓		✓			✓			✓			✓
	Monitor structural attributes and age structure	✓		✓		✓		✓			✓			✓			✓
	Monitor for presence on non-native	✓		✓		✓		✓			✓			✓			✓
Grassland																	
Area B	Monitor cover of rye grasses and species indicative of elevated nutrient levels	✓	✓	✓													
	Sowing of yellow rattle and associated management			✓	✓	✓			✓	✓	✓						

	Successive cutting (up to 4-5 cuts) to remove nutrients – reducing number as fertility reduces. Monitor yield by weighing a sample load then recording no. of loads.						✓	✓	✓								
	Monitoring wildflower cover (of indicator species and others excluding undesirable species)		✓	✓	✓		✓		✓	(✓)	✓		✓		✓		✓
	Broadcast indicator species where not meeting 30% cover target								✓			✓					
Ponds and Ditches																	
Area B	Check depths/profiles and establish planting areas	✓															
	Monitor establishment of aquatic plantings to target supplementary planting as necessary		✓	✓													
	Monitor water quality and presence of non-native invasive flora and fauna to target removal/remediation as needed		✓	✓													
	Monitor scrub cover at banks and open water proportions to inform autumn cutting		✓	✓		✓		✓		✓		✓		✓		✓	✓

Whole Site	Summary reporting to land Wentworth Estate / land managers following initial establishment year. Biannial monitoring review/audit & report from year 2. To encompass wildflower/grass cover surveys, scrub & wetland monitoring and audit of implemented management. To include any recommendations for a review of, or amendments to, the Management Plan. For submission to BMBC up to year 10 then every five years thereafter.	✓	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓

NOTES

0 25 50 75m

N

KEY

Native Scrub Planting

Fitzwilliam Wentworth Estate
Land West of Sheffield Road,
Hoyland

FIGURE 1: AREA A HABITAT CREATION AREA

1:1000 @ A3
16 March 2021 CC / SA
9295-E-102 rev -

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FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby
DE74 2RH

t: 01509 672772
e: mail@fpcr.co.uk
w: www.fpcr.co.uk

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NOTES

0 50 100 150m

N

KEY

- Native Scrub Planting
- Native Hedgerows
- Species Rich Grassland
- Ponds
- Ditch
- Existing Public Rights of Way

Fitzwilliam Wentworth Estate
Broomhill Lane,
Darfield

FIGURE 2: AREA B HABITAT CREATION AREA

1:2000 @ A3
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9295-E-101 rev -

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NOTES

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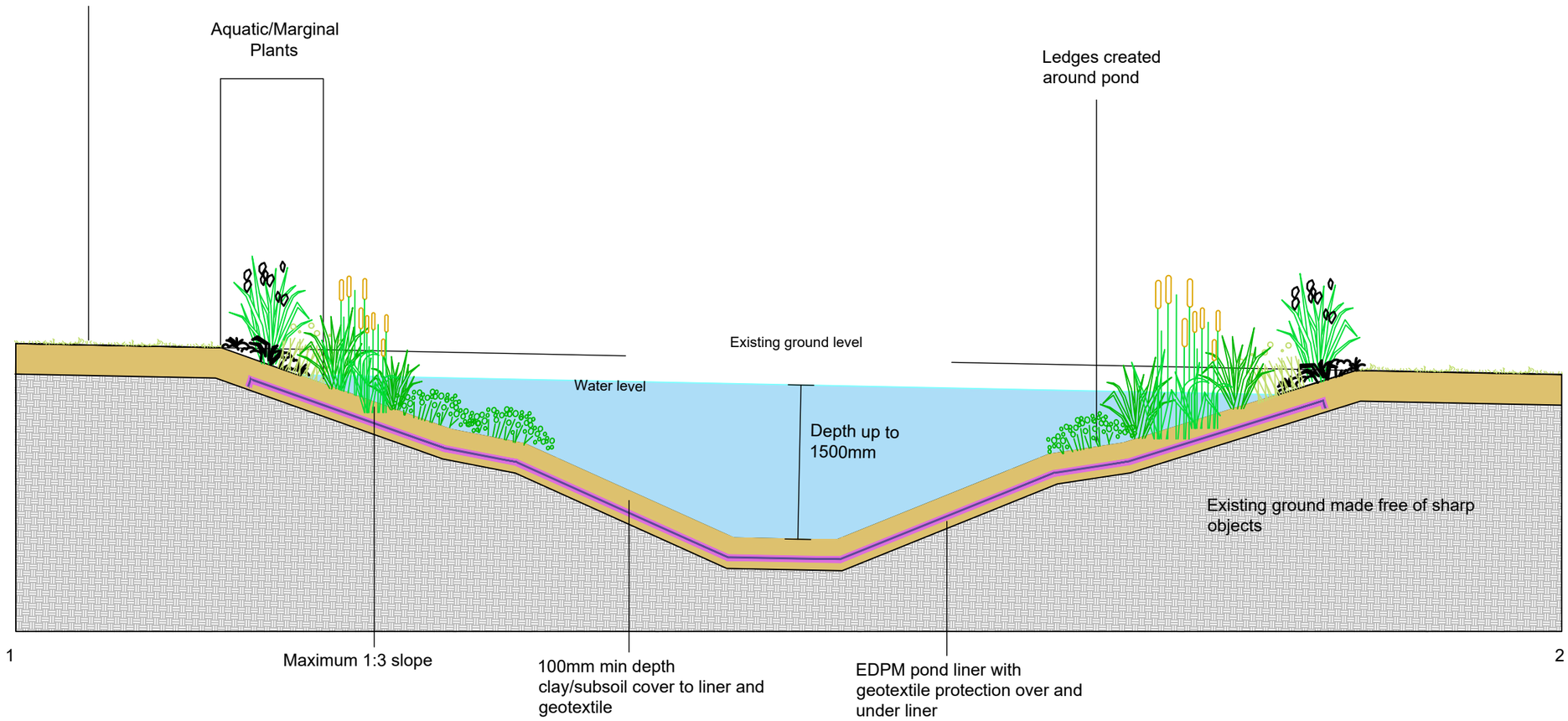
0 25 50 100m

Wetland Meadow Habitats



rev	date	description	drn	chkd
-	13.02.2015	First issue.	LAN	SJA

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client
Newlands Developments

project
Land West of Sheffield Road
Hoyland

drawing title
Figure 3:Pond Cross Section

scale
1:50 @ A3

drawn / checked
LAN / SJA

revision date
16 March 2021

drawing number
0000-L-00

rev
-

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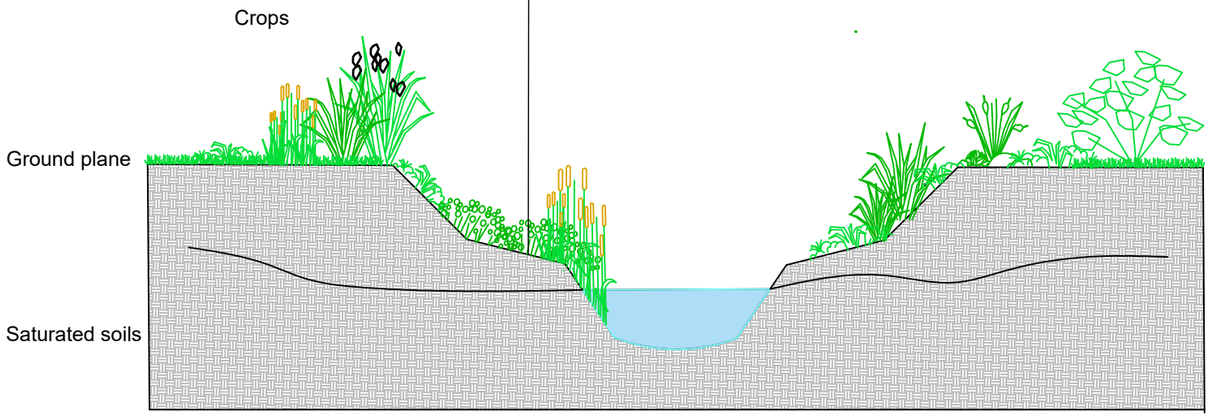
Stream buffer and native vegetation on the benches increase wildlife habitat and provide better bank stability reducing maintenance concerns



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rev	date	description	drn	chkd
-	13.02.2015	First issue.	LAN	SJA
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Lockington Hall
Lockington
Derby DE74 2RH

t: 01509 672772
f: 01509 674565
e: mail@fpcr.co.uk
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Hoyland

drawing title
Figure 4:Ditch Cross Section

scale
1:50 @ A3

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revision date
16 March 2021

drawing number
9295-E-01

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APPENDIX A: Scrub Planting Mix

Scrub Planting Mix (Areas A & B)

Common Name	Scientific Name	% cover
Wych Elm	*Ulmus glabra*	10
Field Maple	*Acer campestre*	5
Dogwood	*Cornus sanguinea*	5
Hazel	*Corylus avellana*	15
Hawthorn	*Crataegus monogyna*	20
Holly	*Ilex aquifolium*	5
Wild Privet	*Ligustrum vulgare*	5
Blackthorn	*Prunus spinosa*	10
Dog-rose	*Rosa canina*	5
Goat Willow	*Salix caprea*	5
Elder	*Sambucus nigra*	5
Guelder Rose	*Viburnum opulus*	10