2021/1049 Land at Smithies Marsh

UK Habitat Condition Assessment Report

August 2022

Client:	Yorkshire Wildlife Trust	
Site Address:	Smithies Marsh, Smithies Lane Barnsley	
Central grid reference:	SE 3445 0815	
Revision:	2	
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1.0 Introduction

1.1 Instruction

This Biodiversity Net Gain (BNG) Assessment has been undertaken on behalf of Yorkshire Wildlife Trust, Potteric Carr Nature Reserve, Doncaster. It has been produced to provide the results and an overview of the biodiversity net gain assessment undertaken at Smithies Marsh, Smithies Lane, Barnsley using Natural England's Biodiversity Metric 3.0.

The report will also provide an overview of the Biodiversity Net Gain Good Practice Principles (Baker, Hoskin & Butterworth, 2019), legislation, and planning policy as well as recommendations on how to achieve a high BNG score.

1.2 Site description

Smithies Marsh is located to the north of central Barnsley, adjacent to the north of the River Dearne (SE 34484 08168) (see Figure 1). The Dearne lies on the southern boundary of the Site and flows in a south-easterly direction.

The Site consists of two parts; the focus of the scheme within the south, which consists of an area of low-lying land within the floodplain of the Dearne; and the land to the north with sloping dry ground up the valley side to the disused railway line.

A section of the Site along the mid-eastern boundary is within a local wildlife site (Barnsley Canal at Wilthorpe) see Figure 4.

The landscape context of the study site is of significance. The Dearne catchment is a sub-catchment of the River Don, itself one of the major sub catchments of the Humber river system. Along the River Dearne from its source in Upper Cumberworth to its confluence with the River Don at Denaby are many well-known wetlands of nature conservation significance, including recently designated wetland Sites of Special Scientific Interest (SSSIs) at Wombwell Ings, Broomhill Flash, Old Moor, Bolton Ings, Edderthorpe Flash, Carlton Marsh, Adwick Washlands, Denaby Ings and Worsbrough Reservoir. Some of these are encompassed by the Dearne Nature Improvement Area (NIA) – a designation recognising the importance of the collective importance of these wetlands at landscape scale, though the site falls 0.6 km outside of the NIA boundary.

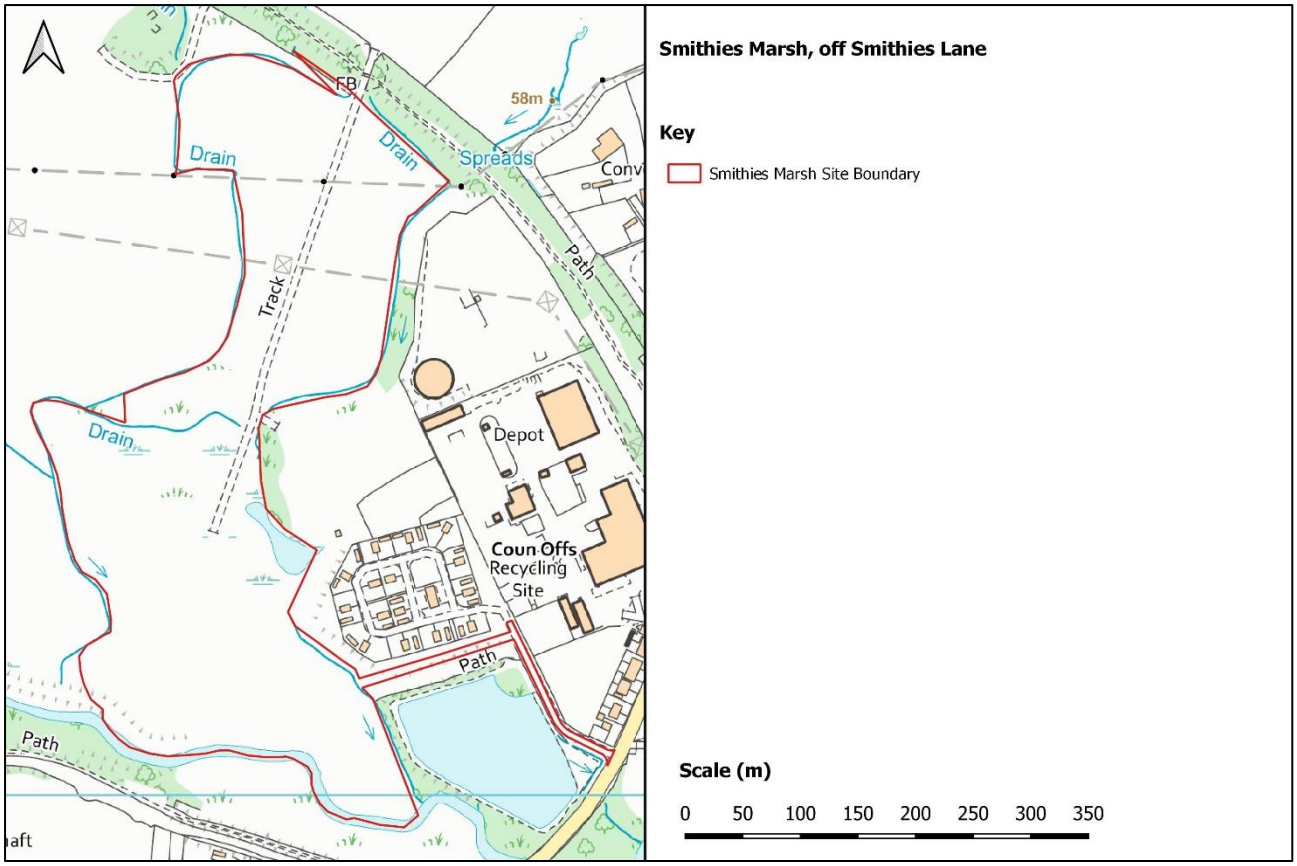


Figure 1: Site location

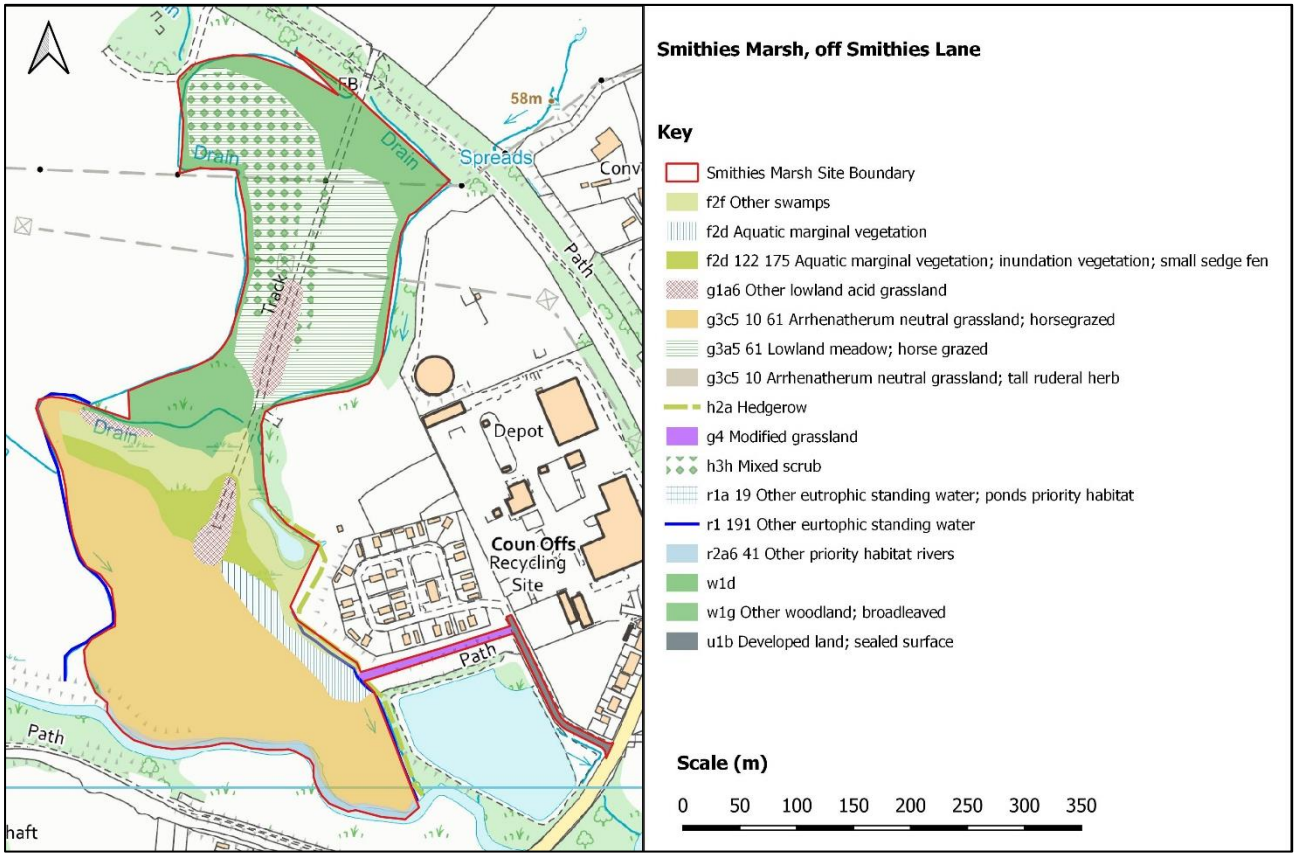


Figure 2: Site UK Habitats

1.3 The project

The scheme is intended to reconnect the Dearne to its original floodplain, and create additional wetland features including:

- Re-profiling of 4 no. sections of the northern bank of the Dearne totalling 250 m in length;
- Creation of 3 no. shallow > 0.75 m deep ponds; and
- Creation of 5 no. shallow > 0.75 m deep scrapes.

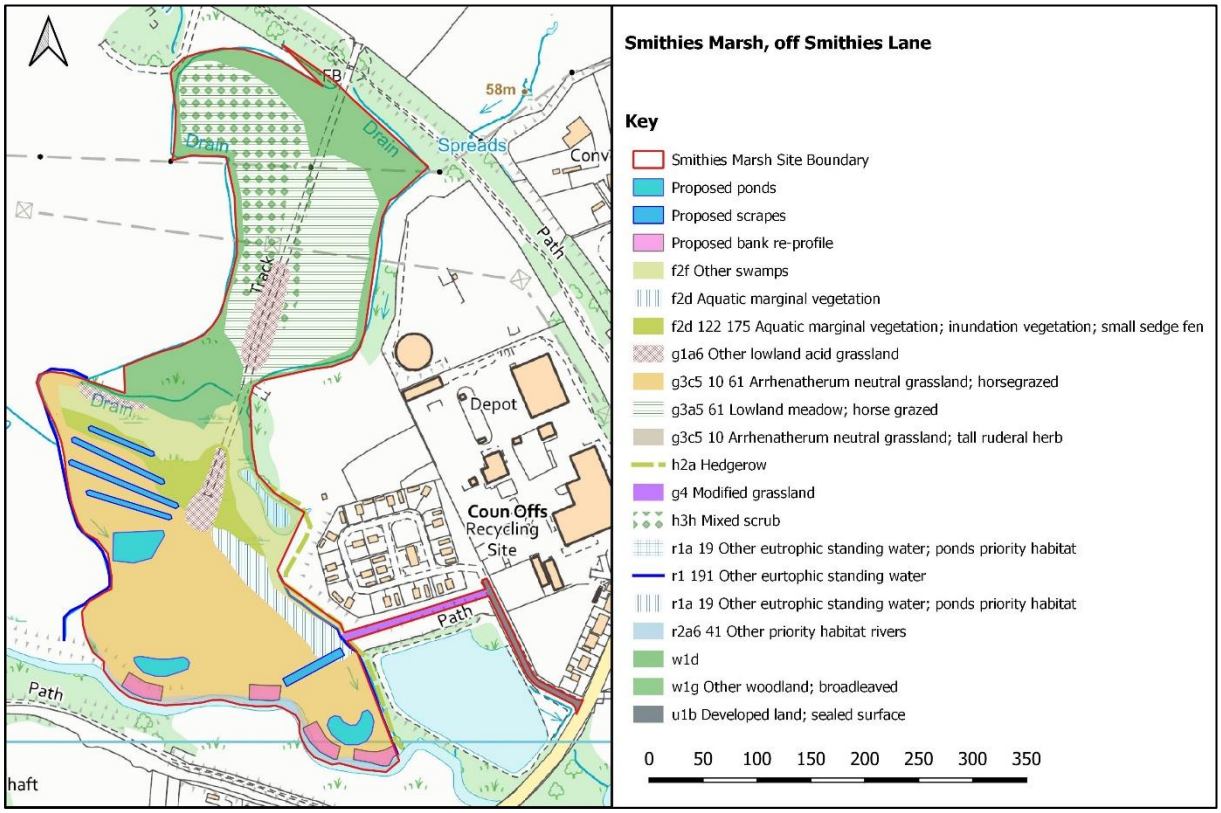


Figure 3: Site plan proposals

1.4 Objectives

The three outputs of the Biodiversity Metric for terrestrial habitats are:

- Area Habitat Biodiversity Units - Habitat area such as grassland, woodland or other areas of habitats which are measured in hectares (ha);
- Hedgerow Biodiversity Units - Linear features such as hedgerows or lines of trees which are measured in kilometres (km); and
- Water course Habitat Biodiversity Units - Linear features such water courses which are measured in kilometres (km).

1.5 Scope of works

The biodiversity metric and assessment were informed by Site visits undertaken by Jeff Lunn 30 June 2021 and by Helen Norford on 19 May 2022. The approach to the BNG assessment follows the Biodiversity Net Gain: Good practice principles for development published by CIEEM, IEMA, CIRIA, UK (2019), more details have been provided later in this report.

1.6 Legislation and Planning Policy

The Environment Act 2021

This legislation has been recently ratified and will now enter a period of transition which currently is proposed to last until 2023 when secondary legislation will be passed. This period affords local authorities the time to adapt policy and establish nature recovery networks. The Act however mandates the requirement of 10% net gains for biodiversity and as such should be the aim of all new development.

However, it is worth noting, in the transition period, local authorities are expected to manage the mandatory requirement for net gain independently and relative to their progress towards setting up the necessary infrastructure to support the delivery of net gain. As such local policy is of great importance in determining sufficient net gain requirements in support of any given planning application.

National Planning Policy Framework

The National Planning Policy Framework (NPPF) (2021) guides Local Planning Authorities (LPAs) when developing their planning policies and considering planning applications affecting protected habitats, sites, and species.

Planning Policy Statement 15: Conserving and enhancing the natural environment of the NPPF recognises that, planning policies and decisions should contribute to and enhance the natural and local environment. Section D of Paragraph 174 states:

"Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; In respect of the natural environment."

Section B of Paragraph 179 states:

"Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity".

Section D of Paragraph 180 also states:

"Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate".

Local Planning Policy

Local Planning Authorities are also producing new Local Plan documents or Local Planning Frameworks which set out a local authority's requirement for biodiversity net gain. In some

areas these can exceed the 10% requirement of the proposed Environment Bill's net gain requirement.

The Site falls into Barnsley Local Plan 2012- 2029, Barnsley Biodiversity Action Plan and within the Dearne Valley Green Heart Nature Improvement Area.

2.0 Methods

2.1 Habitat condition assessment

A Site survey was undertaken on 30 June 2021 by Jeff Lunn BEM BSc MPhil CEcol CEnv MCIEEM followed by a second visit by Helen Norford BA (hons), MSc on 19 May 2022.

The initial visit was completed using Phase 1 habitat survey techniques as defined in the standard methodology (JNCC, 2016) the second visit applied data from the initial 2021 survey and the UK Habitat Classification (UK Hab) (Butcher *et al.,* 2020). The aim was to gather sufficient baseline information on the habitats within the Site to allow an interpretation of the ecological value of the land.

During the second Site survey habitats were assessed against the Natural England habitat condition assessment criteria (Natural England Joint Publication, 2021). The condition assessment criteria are dependent on the habitats present onsite, with each assessment containing sets of criteria which are either passed or failed. Criteria include things such as species composition, presence of undesirable species and percentage cover.

This is considered standard practice to calculate the biodiversity value of the Site. Site visits to assess the condition of the habitats were undertaken during the optimal botanical growing season (May to September).

A MoRPH5 field survey was undertaken in accordance with Natural England's Biodiversity Metric 3.0 together with a desktop survey to evaluate the baseline river condition assessment for the River Dearne which flows west to east in along the southern boundary of the Site. The data were then analysed in cartographer to give condition assessment results.

2.2 Biodiversity net gain good practice principles

CIRIA, CIEEM and IEMA developed The Biodiversity Net Gain Good Practice Principles in 2016 which has then been used to produce a more in-depth document (Baker, Hoskin & Butterworth, 2019) detailing the ten main good practice principles for achieving biodiversity net gain, summarised in Table 1.

2.3 Biodiversity metric

The Biodiversity Metric 3.0 Calculation Tool (Natural England Joint Publication, 2021) was used to calculate the ecological baseline of the Site using the methodology as described above. The habitat types, conditions and areas were input into the metric to form the Site's habitat baseline. Additionally, the biodiversity metric calculation tool collects information on distinctiveness and strategic significance. These categories are described in more detail below.

Habitats are assigned distinctiveness bands. These are based on an assessment of the distinguishing features of a habitat, including consideration of species richness, rarity (at local, regional, national, and international scales), and the degree to which a habitat supports species rarely found in other habitats. The distinctiveness band of each habitat is

preassigned in the Biodiversity Metric 3.0 and are based on the UK Habitat Classification survey system.

Table 1: Good Practice principals

Principal	In practice
Apply the mitigation hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.
Avoid losing biodiversity that cannot be offset elsewhere	Avoid impacts on irreplaceable biodiversity i.e., statutory designated sites such as SSSI's – these impacts cannot be offset to achieve net gain.
Be inclusive and equitable	Engage stakeholders early and involve them in designing, implementing, monitoring, and evaluating the approach to net gain. Achieve net gain in partnership with stakeholders where possible.
Address risk	Mitigate difficulty, uncertainty, and other risk to achieving net gain. Apply well accepted ways to add contingency when calculating biodiversity losses and gain to account for any remaining risk, as well as to compensate for the time between the losses occurring and the gains being fully realised.
Make a measurable net gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.
Achieve the best outcomes for biodiversity	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly justified choices when: • Delivering compensation that is ecologically equivalent in type, amount, and condition and that accounts for the location and timing of biodiversity losses. • Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation. • Achieving net gain locally to the development while also contributing towards nature conversation priorities at local, regional, and national levels. • Enhancing existing or creating new habitat. • Enhancing ecological connectivity by creating more bigger, better, and joined areas for biodiversity.
Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations, i.e., do not deliver something that would occur anyway
Create a net gain legacy	Ensure net gain generates long term benefits by: • Engaging stakeholders and jointly agreeing practical solutions that secure net gain in perpetuity. • Planning for adaptive management and securing dedicated funding for long term management. • Designing net gain for biodiversity to be resilient to external factors, especially climate change. • Mitigating risks for other land uses. • Avoiding displacing harmful activities from one location to another. • Supporting local level management of net gain activities.
Optimize sustainability	Prioritise BNG and where possible optimise the wider environmental benefits for a sustainable society and economy.
Be transparent	Communicate all net gain activities in a transparent and timely manner, sharing the learning with all stakeholders.

2.4 Strategic significance

Strategic Significance can be defined as the spatial location of a habitat in relation to preferred locations for biodiversity.

The following data sources and resources were searched to gather information on the strategic significance of the Site and its habitats:

- Multi-Agency Geographic Information for the Countryside (MAGIC);
- Barnsley Biological Records Centre and South Yorkshire Bat Group, 1 km data search;
- Barnsley Local Plan 2012-2029;
- Barnsley Biodiversity Action Plan;
- Barnsley River Dearne Valley Corridor, Green Infrastructure; and
- Environment Agency's River Dearne catchment data.

2.5 Survey comments

The results and recommendations within this report are valid for up to two years from the date of second survey, assuming there are no significant changes to the survey Site or its immediate surroundings.

The habitat condition assessments survey of the Site was undertaken during the optimal botanical survey season (April to September).

It is considered sufficient information was collected during surveys to undertake the habitat condition assessments.

3.0 Results

The following sections provide an overview of the baseline Site results including the strategic significance and baseline Site scores.

3.1 Baseline habitat assessment

Most of the Site encompasses grassland habitats considered to be of ecological value for flora, invertebrates, birds, small mammals etc. this includes improved, unimproved, and semi-improved neutral, acid, and marshy grasslands in poor to moderate condition; the remainder of the habitats, open water, wetland, broadleaved woodland and hedgerows were assessed as poor to good condition. See Figure 2.

The habitats recorded onsite are described in detail below with a description of the habitat condition assessment results.

3.2 Strategic Significance

A section of the Site forms part of a Local Wildlife Site and forms part of the River Dearne Green Corridor, green infrastructure identified in the Barnsley Local Plan (adopted 2019), it is also within 0.6 km of the Dearne Green Valley Heart Nature Improvement Area. The Site therefore is classed as '**within area formally identified in local strategy'** in the metric. See Figures 4 and 5.

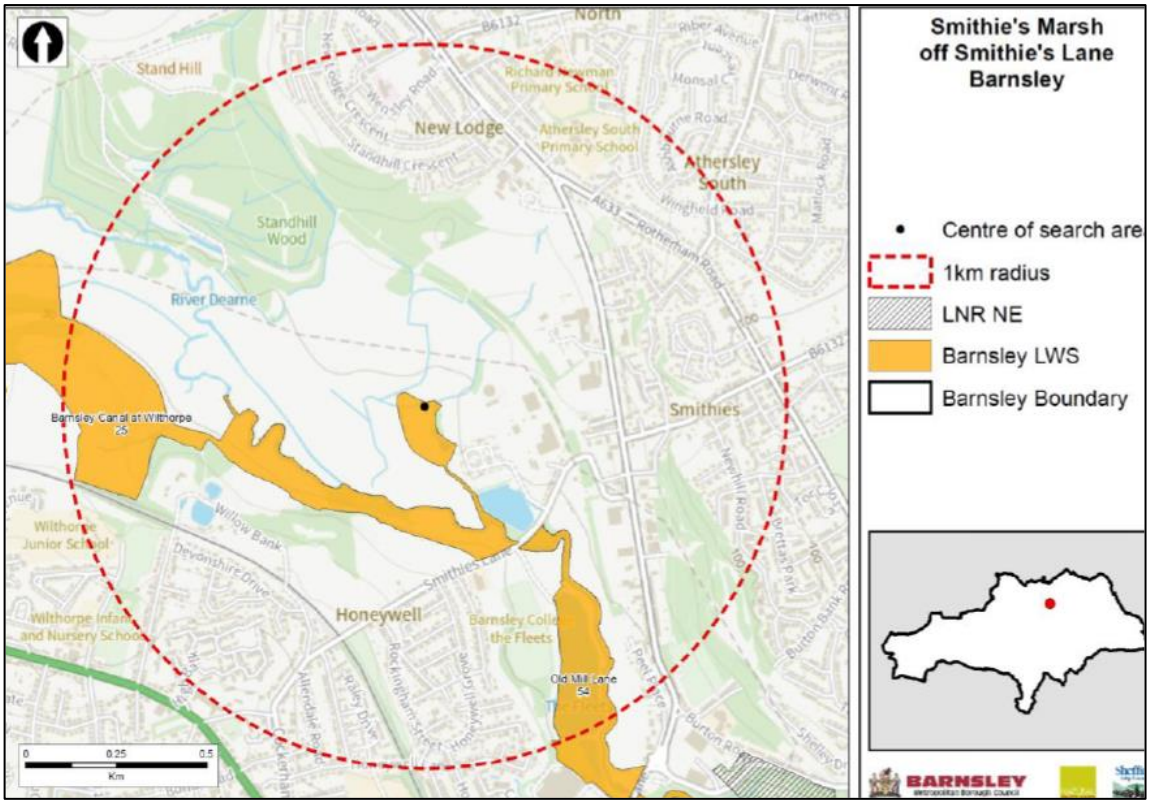


Figure 4: Local statutory and non-statutory sites within a 1 km boundary of the Site

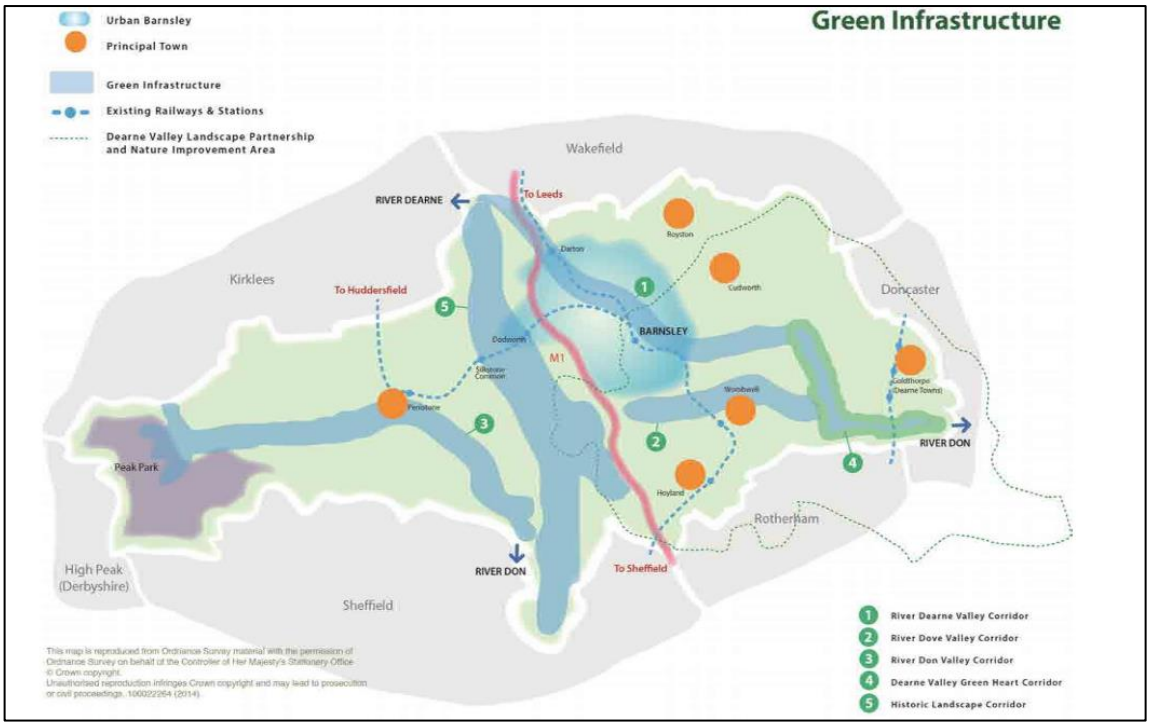


Figure 5: Barnsley Metropolitan Borough Council Green Infrastructure map (Barnsley Local Plan 2012-2029)

3.3 Terrestrial habitats onsite impacted by the scheme, baseline condition assessment and change

SM1 - *Grassland: Floodplain wetland mosaic (CFGM) - g3c5 10 Arrhenatherum neutral grassland scattered scrub*

Total area (ha)	Current condition	Post-scheme condition	Area retained by scheme (ha)	Area enhanced by scheme (ha)	Area habitat creation Priority habitat ponds (ha)	Percentage habitat area enhanced
3.81	Moderate	Good	3.81	3.55	0.27	100

This area comprises degraded neutral grassland with some characteristic species such as red fescue, black knapweed, ribwort plantain, abundant buttercup meadow and creeping, with regular and abundant patches of creeping thistle, broad-leaved dock, and ragwort. Most of the area is dominated by false oatgrass grassland. These latter species are all indicative of heavy and persistent overgrazing. See Figures 2 and 6.

Table 2: Habitat Condition Assessment Summary (Grassland - Floodplain wetland mosaic (CFGM) - g3c5 10 Arrhenatherum neutral grassland; scattered scrub)

Condition Sheet: Grassland - Floodplain wetland mosaic (CFGM)

1	The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. **NB - this criterion is non-negotiable for achieving good condition.**	Fail
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see definitions and links above). Indicator species for the specific wetland habitat type[1] are very clearly and easily visible.	Pass
3	The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Pass
4	Cover of scrub and scattered trees less than 10%.	Pass
5	Cover of bare ground less than 5%.	Pass
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Pass
Condition Assessment Result		**Condition Assessment Score**
6 criteria assessed:		
Passes 5 of 6 core criteria EXCLUDING non-negotiable core criterion 1)		**Moderate (2)**

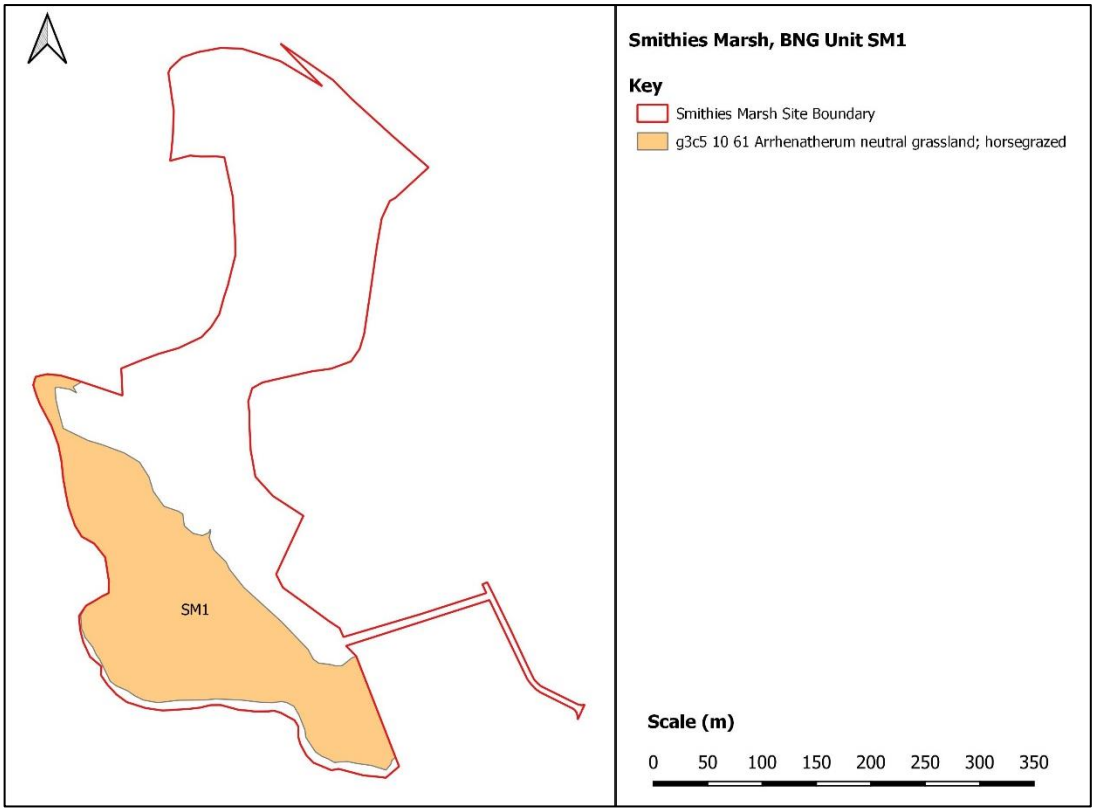


Figure 6: SM1 baseline area

SM1 will be impacted positively by proposals. Reconnecting the Dearne to its floodplain by re-profiling sections of bankside, allowing water at peak flow to enter the Site fulfils the criteria for achieving good condition. Additional wetland features three shallow ponds, and five shallow scrapes will be created to increase seasonal standing water, providing additional habitat for aquatic and semi-aquatic flora to expand ranges and shelter and food resources for fauna.

Water levels, River Dearne, and the site water table, as well as botanical communities will be monitored as part of the Biodiversity and Management Plan for the Site. See Figure 7.

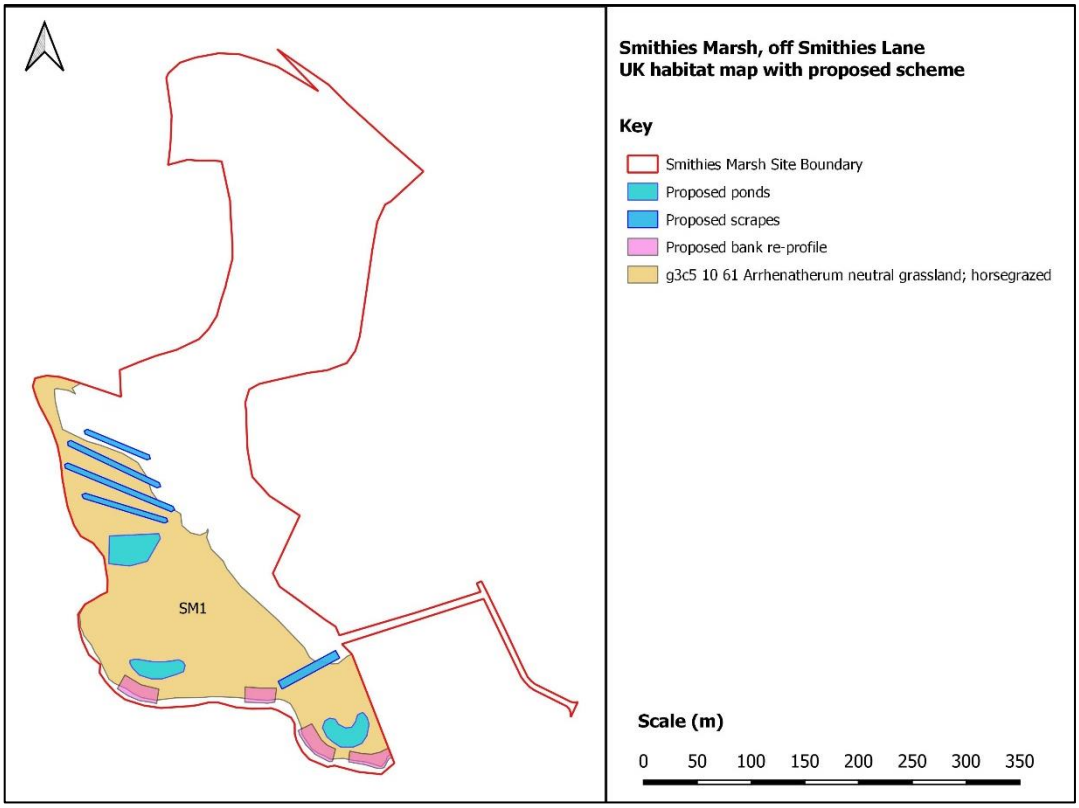


Figure 7: SM1 baseline area with proposals

SM2 - *Grassland: Floodplain wetland mosaic (CFGM) - g4 16 Modified grassland; tall ruderal herb*

Total area (ha)	Current condition	Post-scheme condition	Area retained by scheme (ha)	Area impacted by scheme (ha)	Percentage habitat area enhanced
0.11	Poor	Moderate	0.11	0.11	100

Sections of this habitat form part of a 1 - 2 m margin along the Dearne's northern bank and is notably made up of tall ruderal herb species such as stinging nettle, cow parsley. creeping thistle and willow herbs *spp.* together with grassland *spp.* e.g., cocksfoot, common bent. See Figures 2 and 8.

Himalayan balsam is present in small patches along the extent.

Table 3: Habitat Condition Assessment Summary (Grassland - Floodplain wetland mosaic (CFGM) - g4 16 Modified grassland; tall ruderal herb)

Condition Sheet: Grassland - Floodplain wetland mosaic (CFGM)

1	The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. **NB - this criterion is non-negotiable for achieving good condition.**	Fail
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see definitions and links above). Indicator species for the specific wetland habitat type[1] are very clearly and easily visible.	Fail
3	The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Pass
4	Cover of scrub and scattered trees less than 10%.	Pass
5	Cover of bare ground less than 5%.	Fail
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Fail
Condition Assessment Result		**Condition Assessment Score**
If 6 criteria assessed:		
• Passes 0, 1 or 2 of 6 core criteria		Poor (1)

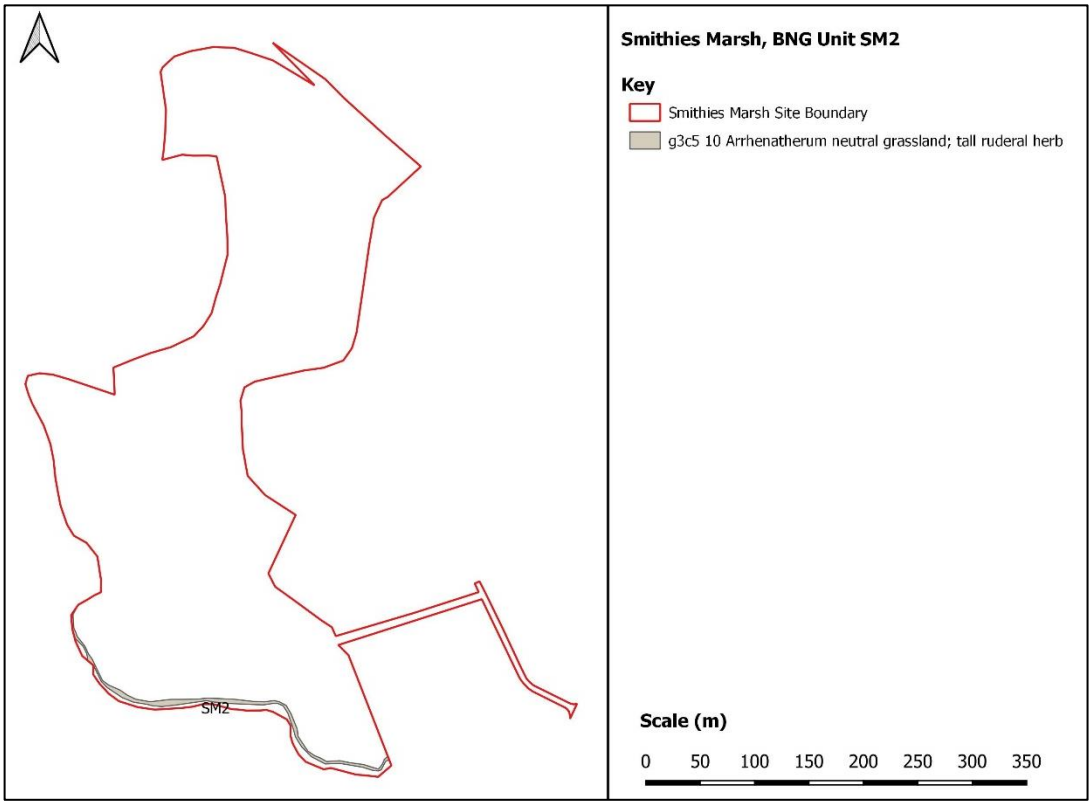


Figure 8: SM2 baseline area

To achieve moderate condition for SM2 management of non-native species Himalayan balsam, noxious weed and scrub control will form part of the Biodiversity and Management Plan. Prior to coir matting installation bank sections will be reseeded with Pond Edge Mixture EP1 increasing flora diversity. See Figure 9 for scheme proposals.



Figure 9: SM2 baseline area with proposals

SM3 -*Wetland f2d 122 175 Aquatic marginal vegetation; inundation vegetation; small sedge fen*

Total area (ha)	Current condition	Post-scheme condition	Area retained by scheme (ha)	Area enhanced by scheme (ha)	Percentage habitat area enhanced
0.37	Moderate	Good	0.36	0.01	2.7

Around the reedswamp is a rich and diverse assemblage of marshland plants with abundant lesser water parsnip, meadowsweet, patches of marsh horsetail, lesser pond sedge and brown sedge and scattered to frequent watercress, celery-leaved buttercup, brooklime, figwort, flote-grass, and reed sweet-grass. Other occasional marsh species include marsh bedstraw, common water plantain, greater birds-foot trefoil, false fox-sedge, bittersweet, gipsywort, water mint, water forget-me not , skullcap, hairy willowherb, marsh ragwort, and rushes soft, blunt-flowered and jointed. The eastern end of the drain has hemlock water dropwort.. See Figures 2 and 10.

Table 4: Habitat Condition Assessment Summary (Wetland f2d 122 175 Aquatic marginal vegetation; inundation vegetation; small sedge fen)

Condition Sheet: WETLAND Habitat Type

1	The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. **NB - this criterion is non-negotiable for achieving good condition.**	Fail
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see definitions and links above). Indicator species for the specific wetland habitat type[1] are very clearly and easily visible.	Pass
3	The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Pass
4	Cover of scrub and scattered trees less than 10%.	Pass
5	Cover of bare ground less than 5%.	Pass
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Pass
Condition Assessment Result		**Condition Assessment Score**
If 6 criteria assessed:		
• Passes 5 of 6 core criteria EXCLUDING non-negotiable core criterion 1		Moderate (2)

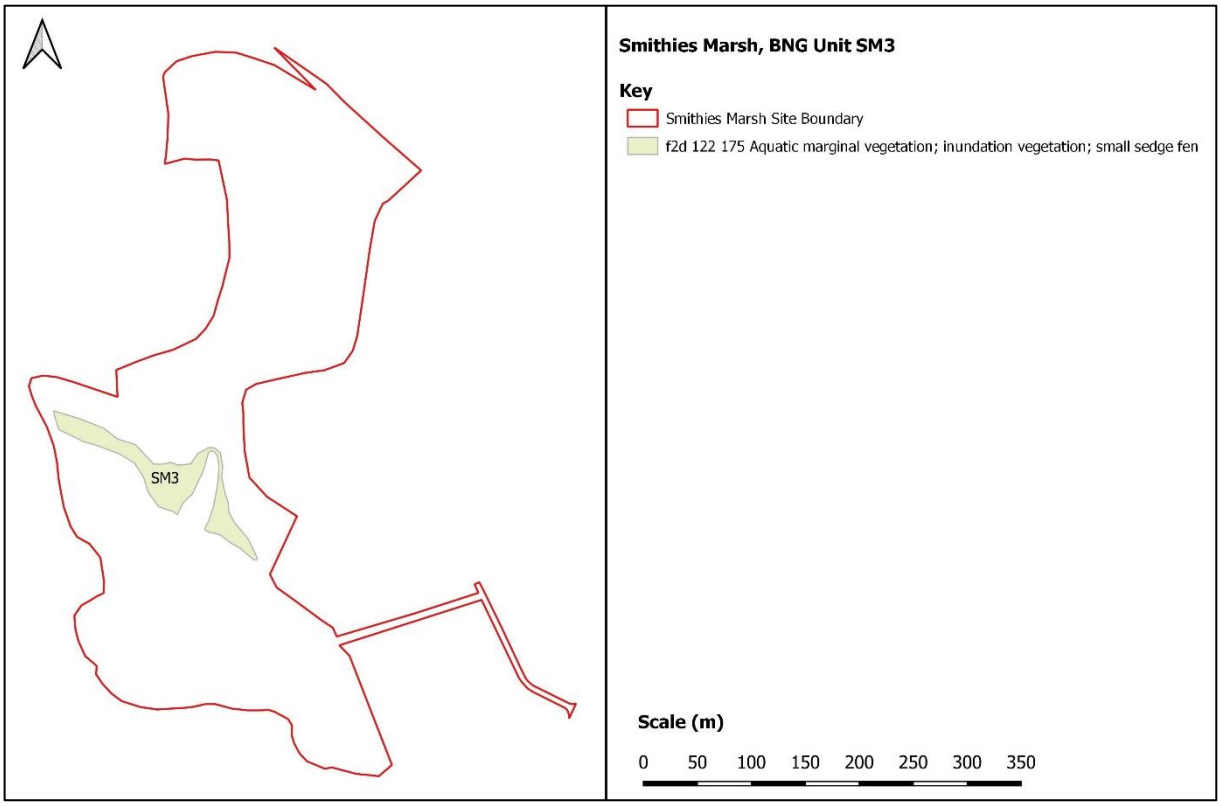


Figure 10: SM3 baseline area

Reconnecting the Dearne to its floodplain will achieve good condition for 0.01 ha of SM3. Bare soil left from scrape creation will be allowed to regenerate from existing seed beds, creating conditions for wetland species to expand their extent including locally rare sedge species (brown sedge). To ensure noxious weed species do not encroach the area botanical monitoring will be in place with controls set out in the Biodiversity and Management Plan for the Site. See Figure 11 for scheme proposals.

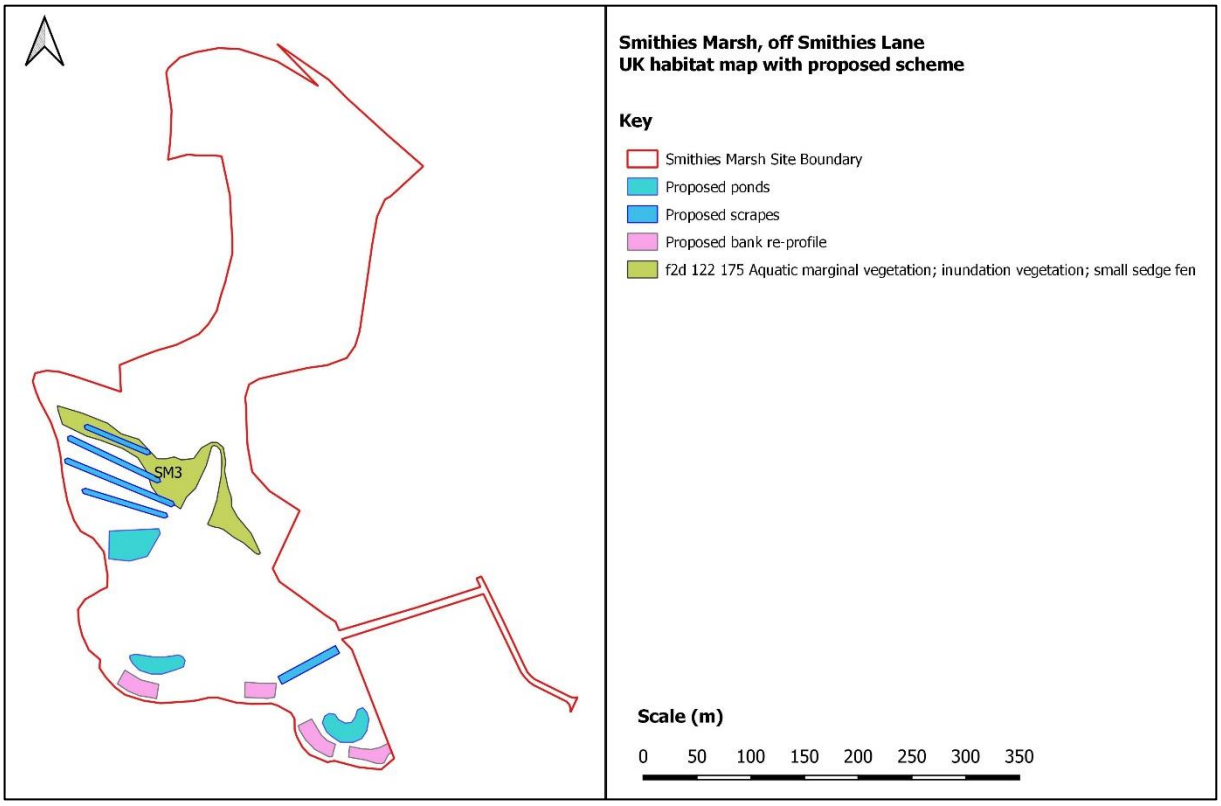


Figure 11: SM3 baseline area with proposals

SM4 - *Wetland: f2d Aquatic marginal vegetation*

Total area (ha)	Current condition	Post-scheme condition	Area retained by scheme (ha)	Area enhanced by scheme (ha)	Percentage habitat area enhanced
0.47	Poor	Moderate	0.44	0.03	6.38

The marsh habitat grades into a marshy grassland inundation community on the southern side of the main swamp. Here a carpet of silverweed grows with the grasses creeping bent, annual meadow-grass and marsh foxtail with white clover as the community further grades into the semi-improved neutral grassland to the south. There is a patch of greater burnet and the grass meadow foxtail indicative of a more traditional floodplain meadow in the historic past. See Figures 2 and 12.

Table 5: Habitat Condition Assessment Summary (Wetland: f2d Aquatic marginal vegetation)

Condition Sheet: WETLAND Habitat Type

1	The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. **NB - this criterion is non-negotiable for achieving good condition.**	Fail
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see definitions and links above). Indicator species for the specific wetland habitat type[1] are very clearly and easily visible.	Pass
3	The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Pass
4	Cover of scrub and scattered trees less than 10%.	Fail
5	Cover of bare ground less than 5%.	Pass
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Fail

Condition Assessment Result	Condition Assessment Score
If 6 criteria assessed:	
• Passes 0, 1, 2, or 3 of 7 criteria	Poor (1)

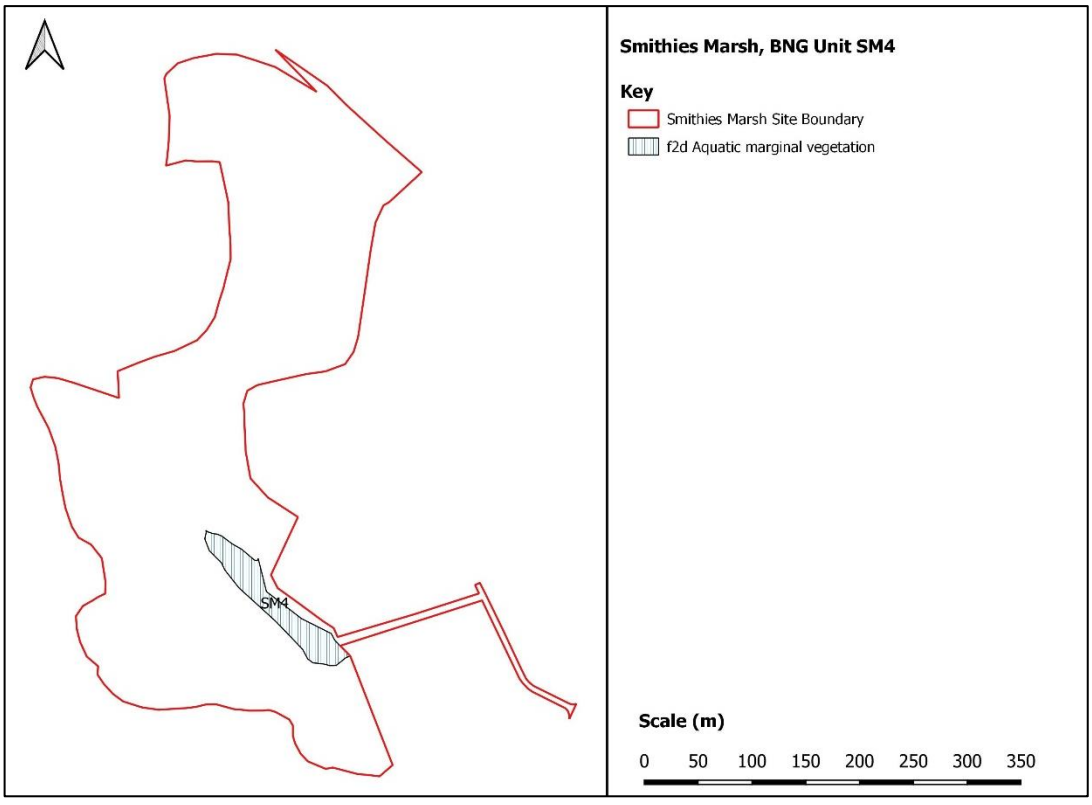


Figure 12: SM4 baseline area

Reconnecting the Dearne to its floodplain will achieve good condition for 0.03 ha of SM4. Bare soil left from scrape creation will be allowed to regenerate from existing seed beds, creating conditions for wetland species to expand their extent.

To ensure noxious weed species and scrub do not encroach the area botanical monitoring will be in place with control set out in the Biodiversity and Management Plan for the Site. See Figure 13 for scheme proposals.

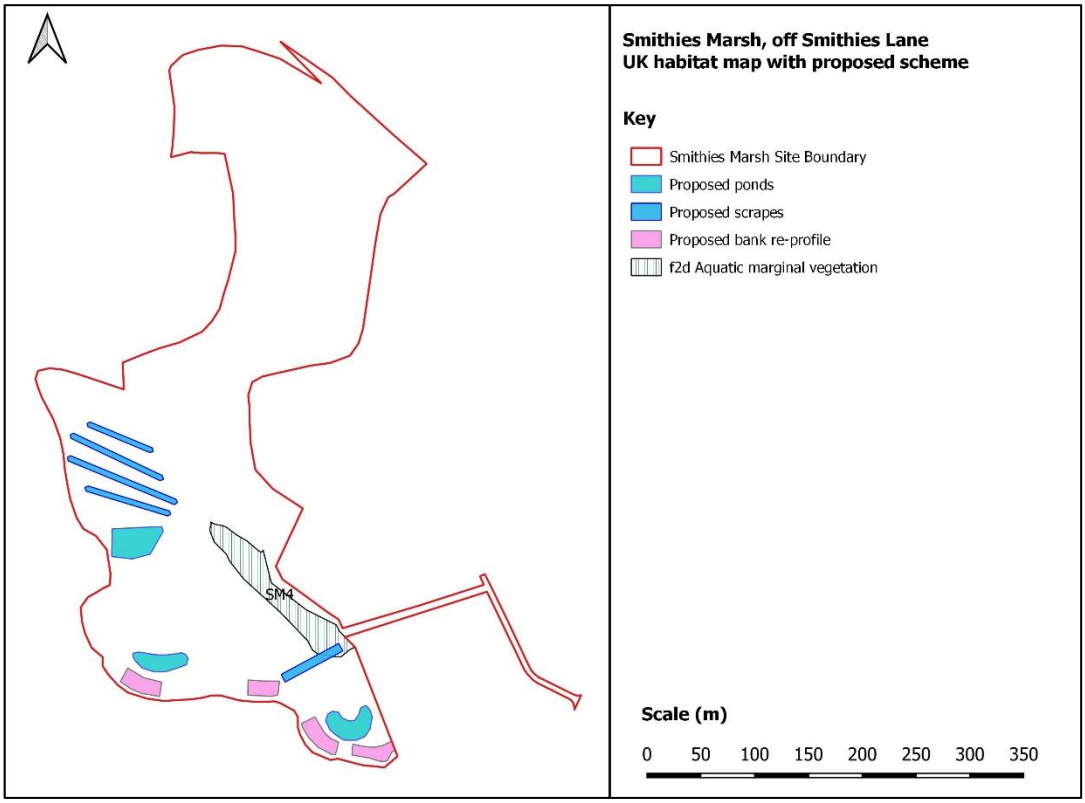


Figure 13: SM4 baseline area with proposals

3.4 River habitat onsite impacted by the scheme, baseline habitat condition and change

R1 - *r2a6 41 Other priority habitat: rivers*

Total length (km)	Current condition	Post-scheme condition	Length retained by scheme (km)	Length enhanced by scheme (km)	Percentage habitat km enhanced
3.2	Moderate	Fairly good	1.6	1.6	50

The River Dearne is a single thread, alluvial river which has been heavily modified historically within the vicinity of the site. Upstream of the site, a c.1km stretch of river has been straightened, resulting in a significant loss of sinuosity from the planform of the river. The disconnected palaeo channel is still evident within the floodplain and reconnection of this channel in the future would provide an excellent opportunity to significantly increase the hydromorphology of the Dearne. The historic channel straightening and realignment continues to influence the present-day morphology. The channel-floodplain connectivity is generally poor throughout the site, most likely due to incision in response to the historic channel realignment, coupled with channel deepening to increase conveyance.

Downstream the channel is overwide and, consequently, the flow velocity is low. The river is unable to flush fine sediment through the reach during low flows, causing it to deposit on the bed and smother the gravels present in the substrate. The banks are steep and the low flow water levels are c.2m below the surrounding floodplain on the left bank. The riparian cover is patchy, with stretches of mature trees interspersed with areas of grassy banks and Himalayan balsam. At the far downstream extent of the site, a combination of bank collapse and fine sediment deposition is causing a fine sediment berm to develop on the inside of the channel meander on the left bank

Upstream towards the top end of the Site, and beyond into the surrounding farmland, the hydromorphology of the river improves substantially. The right bank floodplain connectivity is good and there is a large area of wet woodland in the vicinity of the palaeo channel on the right bank floodplain associated with the old river course. The river width is narrower and more varied through this section and flow velocity is faster than in the downstream portion of the site. As a result, the riverbed exhibits more diversity, with riffled flow over gravel deposits in places.

A MoRPH5 field survey was used to assess the condition of the Dearne which flows west to east along the southern boundary of the Site. Data from the field survey and proposed habitat enhancements were run through Cartographer to generate a post-intervention condition for this section of river. See Figures 2 and 14.



Figure 14: R1 baseline area

The proposed works to a 250 m section of the River Dearne affords the opportunity to improve the aquatic, bank face and bank top habitats within this section. These improvements are summarised as follows:

- Replanting on the left bank top, provides more diverse botanical communities;
- Reprofiling of the left bank face with a gravel pebble berm improving the diversity of the left bank profile; and
- Removal and management of Himalayan balsam on both bank tops and bank face.

See figure 15.



Figure 15: R1 baseline area with proposals

3.5 Terrestrial habitats onsite not impacted by the scheme baseline habitat condition

g1a6 Other lowland acid grassland

Total area (ha)	Area retained by scheme (ha)
0.46	0.46

Small areas of acid grassland occur on old colliery tip excavations and along the track running northwards and are a consequence of natural colonisation after industrial activity. In these areas patches of wavy hairgrass and sheep's fescue with characteristic herbs such as mouse-eared hawkweed, hawkweed *spp.* group, tormentil, sheep's sorrel and devil's bit scabious and patches of the moss *Campylopus introflexus*. See Figure 2.

Table 6: Habitat Condition Assessment Summary (Grassland - Floodplain wetland mosaic (CFGM) - g3c5 10 Arrhenatherum neutral grassland; scattered scrub)

Condition Sheet: GRASSLAND Habitat Type (medium, high & very high distinctiveness)

Condition Assessment Criteria		
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges, and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.	Pass
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds, and small mammals to live and breed.	Fail
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Pass
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.	Pass
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species[1] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.	Pass
Condition Assessment Result		**Condition Assessment Score**
Passes 3 or 4 of 5 criteria		Moderate (2)

g3a5 10 61 Lowland meadow; scattered scrub; horse grazed

Total area (ha)	Area retained by scheme (ha)
2.87	2.87

This area occurs on the northern half of the site and appears to be former pasture which has been unmanaged or grazed for many years. A wide range of neutral grassland species and communities occur including red fescue, sweet vernal grass, cocksfoot, common bent and crested dog's-tail with a range of characteristic herbs including meadow vetching, common bird's-foot trefoil, selfheal, white and red clovers , meadow and creeping buttercup *acris*. Some heavily rabbit or horse grazed patches have plants such as red bartsia, and there are occasional other species such as the sedges and, fleabane and crosswort . The grassland grades into extensive patches of false oatgrass grassland indicative of abandonment, and scattered scrub. A colony of around 30 plants of common spotted orchid along with one southern marsh orchid occurs. See Figure 2.

Table 7: Habitat Condition Assessment g3a5 10 61 Lowland meadow; scattered scrub; horse grazed

Condition Sheet: GRASSLAND Habitat Type (medium, high & very high distinctiveness)

Condition Assessment Criteria		
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges, and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.	Pass
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds, and small mammals to live and breed.	Pass
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Fail
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.	Pass
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species[1] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.	Pass
Condition Assessment Result		**Condition Assessment Score**
Passes 3 or 4 of 5 criteria		Moderate (2)

g4 Modified grassland

Total area (ha)	Area retained by scheme (ha)
0.1	0.1

This area represents the access onto site from the highway and is typical of seeded amenity grassland with few herb species with a relatively low ecological value, at the time of survey an extent of bare and scorched ground was recorded with Japanese knotweed on the boundary leading to a poor condition score. See Figure 2.

Table 8: Habitat Condition Assessment g4 Modified grassland

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)

Condition Assessment Criteria		
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. NB - this criterion is non-negotiable for achieving good condition.	Fail
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds, and small mammals to live and breed.	Fail
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Pass
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.	Pass
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Fail
6	Cover of bracken less than 20%.	Pass
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Fail
Condition Assessment Result		**Condition Assessment Score**
Passes 0, 1, 2 or 3 of 7 criteria		Poor (1)

w1g Other woodland; broadleaved

Total area (ha)	Area retained by scheme (ha)
0.7	0.7

An area of oak-birch woodland has developed on the west side of the site just on the northern edge of the marsh. Here, this is dominated by oak *Q. robur* and silver birch *Betula pendula* over an understory largely of rough meadow-grass *Poa trivialis*. The substrate is old spoil, and the area is likely to have naturally developed as woodland on old colliery spoil. See Figure 2.

Table 9: Habitat Condition Assessment w1g other woodland; broadleaved

Condition Sheet: WOODLAND Habitat Type

Condition Assessment Criteria					
Indicator		**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**	**Score per indicator**
1	**Age distribution of trees[1]**	Three age classes present	Two age classes present	One age class present	2
2	**Wild, domestic, and feral herbivore damage**	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	3
3	**Invasive plant species[3]**	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	3
4	**Number of native tree species**	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	2
5	**Cover of native tree and shrub species**	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	2

6	**Open space within woodland[4]**	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	3
7	**Woodland regeneration[5]**	All three classes present in woodland: trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	2
8	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high-risk pest or disease present	2
9	**Vegetation and ground flora**	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	1
10	**Woodland vertical structure[6]**	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	2
11	**Veteran trees[7]**	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	1
12	**Amount of deadwood**	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems, and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems, and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	1
13	**Woodland disturbance8**	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	3
Total score (out of a possible 39)					**27**
Condition Assessment Result				**Condition Assessment Score**	
Total score 26 to 32				Moderate (2)	

w1d Wet woodland

Total area (ha)	Area retained by scheme (ha)
0.01	0.01

A small area of a wet woodland compartment is present on the southwestern boundary predominantly consisting of similar aged self-set willow spp. with sycamore and hawthorn appearing rarely. The understory where present is dominated by Himalayan balsam and tall ruderal herb species such as stinging nettle. See Figure 2.

Table 10: Habitat Condition Assessment w1d wet woodland

Condition Sheet: WOODLAND Habitat Type

Condition Assessment Criteria					
Indicator		**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**	**Score per indicator**
1	**Age distribution of trees[1]**	Three age classes present	Two age classes present	One age class present	1
2	**Wild, domestic, and feral herbivore damage**	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	3
3	**Invasive plant species[3]**	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	3
4	**Number of native tree species**	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	1
5	**Cover of native tree and shrub species**	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	2
6	**Open space within woodland[4]**	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	3
7	**Woodland regeneration[5]**	All three classes present in woodland: trees 4-7cm dbh, saplings and seedlings or	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	2

		advanced coppice regrowth			
8	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high-risk pest or disease present	2
9	**Vegetation and ground flora**	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	1
10	**Woodland vertical structure[6]**	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	2
11	**Veteran trees[7]**	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	1
12	**Amount of deadwood**	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems, and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems, and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	1
13	**Woodland disturbance[8]**	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	2
				Total score (out of a possible 39)	**26**
Condition Assessment Result				**Condition Assessment Score**	
Total score 26 to 32				Moderate (2)	

h2a Hedgerows

Total length (km)	Length retained by scheme (km)
0.06	0.06

A short section of hedgerow running along the western boundary is present within the Site, the remainder lies outside of the Site. The hedgerow was assessed with an associated ditch and without trees. It consists of native species common hawthorn, with occasional other woody species such as elder and crab apple. See Figure 2.

Table 11: Habitat Condition Assessment h2a hedgerow associated with bank or ditch

Part 1b - Condition assessment of hedgerows

Core groups - applicable to all hedgerow types				
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).	Pass
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g., blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[4]).	Pass
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	Pass
B2.	Gap - hedge canopy continuity	· Gaps make up <10% of total length and · No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness but are not subject to the >5 m criterion (as this is the typical size of a gate).	Pass

C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: • measured from outer edge of hedgerow, and • is present on one side of the hedge (at least)	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness but are not subject to the >5 m criterion (as this is the typical size of a gate).	Fail
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (Urtica spp.), cleavers (Galium aparine) and docks (Rumex spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Fail
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.	Pass
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g., excessive hedge cutting).	Pass
Additional group - applicable to hedgerows with trees only				
E1	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.	Fail
E2	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	Pass

Condition categories for hedgerows with trees		
Category	**Maximum number of attributes that can fail to meet 'favourable condition' criteria in Table TS1-2**	**Weighting (score)**
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3

r1a 19 Other eutrophic standing water; ponds priority habitat

Total area (ha)	Area retained by scheme (ha)
0.06	0.06

A deep pond semi-natural standalone pond is located in the north-eastern corner of the Site. Lush reed / grass communities appear along the margin with emergent and floating species covering <50% of the surface (The main aquatic plants are Duckweed *Lemna minor* and Water Starwort *Callitriche stagnalis*). Access was difficult within the area due to high water levels at the time of survey. See Figure 2.

Table 12: Habitat Condition Assessment Summary - r1a 19 Other eutrophic standing water; ponds priority habitat

Condition Sheet: POND Habitat Type

Condition Assessment Criteria		
CORE CRITERIA - applicable to all ponds (woodland[1] and non-woodland):		
1	The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.	Pass
2	There is semi-natural habitat (i.e., moderate distinctiveness or above) for at least 10 m from the pond edge.	Pass
3	Less than 10% of the pond is covered with duckweed or filamentous algae.	Pass
4	The pond is not artificially connected to other waterbodies, either via streams, ditches, or artificial pipework.	Pass
5	Pond water levels should be able to fluctuate naturally throughout the year. No obvious dams, pumps, or pipework.	Pass
6	There is an absence of non-native plant and animal species[2].	Pass
7	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	Pass
ADDITIONAL CRITERIA - only applicable to non-woodland ponds:		
8	In non-woodland ponds, plants, be they emergent, submerged, or floating (excluding duckweeds)[3], should cover at least 50% of the pond area that is less than 3 m deep.	Pass
9	The surface of non-woodland ponds is no more than 50% shaded by woody bankside species.	Pass
Condition Assessment Result		
If 10 criteria assessed (non-woodland ponds):		**Condition Assessment Score**
Passes 9 of 9 criteria		**Good**

h3h Mixed scrub

Total area (ha)	Area retained by scheme (ha)
1.3	1.3

Scattered scrub occurs in the northern section on lowland grassland grading into more extensive scrub in the north-east part of the site and towards the woodland areas. It predominantly comprises common hawthorn *C. monogyna*, grey willow *Salix cinerea* and bramble *Rubus fruticosus agg.,* with occasional other woody species such as oak, sycamore and elder Sambucus. A mature crab apple *Malus sylvestris* occurs on the western boundary. See Figure 2.

Table 13: Habitat Condition Assessment Summary – SCRUB - h3h mixed scrub

Condition Sheet: SCRUB Habitat Type

Condition Assessment Criteria		
1	Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).	Pass
2	There is a good age range – all of the following are present: seedlings, young shrubs, and mature shrubs.	Fail
3	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.	Pass
4	The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).	Pass
5	There are clearings, glades or rides present within the scrub, providing sheltered edges.	Pass
Condition Assessment Result		**Condition Assessment Score**
Passes 3 or 4 of 5 criteria		Moderate (2)

u1b Developed land; sealed surface

The access road falls into the developed land – sealed surface category.

This habitat does not require a condition assessment, as this habitat automatically scores very low distinctiveness is the Biodiversity Metric with the set condition assessment of **N/A other in** the Biodiversity Metric. See Figure 2.

3.6 Biodiversity net gain good practice principles

Overview of the Biodiversity Net Gain Good Practice Principles

Table 14: Good Practice principals

Principal	Discussion
Apply the mitigation hierarchy	In line with the mitigation hierarchy the habitats of value on Site coastal floodplain grazing, (3.92 ha) and a small area of reedbed will be enhanced (0.04 ha). Other high value habitats, acid grassland, reedbed, woodland, scrub, hedgerows, lines of trees will be retained as part of the scheme. No habitats identified within the Site will be lost.
Avoid losing biodiversity that cannot be offset elsewhere	This scheme has been designed to enhance grassland habitats onsite by reconnecting the Dearne to its floodplain and creating a series of shallow scrapes and ponds. Therefore, no biodiversity will be lost onsite.
Be inclusive and equitable	This scheme has been developed in conjunction with the Environment Agency, Barnsley Metropolitan Borough Council and Dearne Valley Green Heart Partnership with support from Natural England.
Address risk	The CEMP: Biodiversity for this Site identifies any risks and outline the required mitigation to eliminate risk.
Make a measurable net gain contribution	The recently ratified Environment Act requires a 10% net gain for all developments but remains in a period of transition pending secondary legislation and regulation. The Biodiversity Net Gain for this scheme has a 9.76% gain for habitat units and 12.51% for river units onsite.
Achieve the best outcomes for biodiversity	It is considered reconnecting the Dearne to its natural floodplain will deliver the best outcomes for biodiversity at this Site and will include a more diverse range of habitats (scrapes and ponds) in comparison to the current baseline habitats.
Be additional	Habitat enhancement features on Site will comprise five scrapes and three ponds, a native seed mix will be used to under sow coir matting which will protect re-profiled banks and provide more diverse habitats and flora communities than currently present.
Create a net gain legacy	A 30-year Biodiversity and Enhancement Management Plan has been produced for the Site with details of the management and maintenance of restored habitats, any remedial actions which may be required to meet the condition assessments and a timeframe for monitoring.
Optimize sustainability	The scheme will seek to comply with current policy on sustainability. Construction materials can be locally sourced reducing the need for longer delivery vehicle journeys. It may also be possible to use local construction labour which, again can reduce the vehicle mileage (Corstorphine & Wright, 2022). This Site also offers local communities access to green space benefiting health and well-being for users, with potential to participate in events and volunteering onsite.
Be transparent	This report outlines all limitations, methodology and results in relation to the biodiversity metric. In addition, the Preliminary Ecological Assessment and CEMP: Biodiversity Plan outlines any other ecological impacts and mitigation in relation to both species, habitats, and designated sites. These documents are available publicly at the online Public Access planning portal to any interested parties.

3.7 Biodiversity net gain baseline and post-scheme units

Summary baseline habitat unit score with post-scheme areas and units

UK habitat baseline units, areas, lengths with post-scheme areas and units are summarised below in Tables 15-17, detailed descriptions of habitats impacted by the scheme and their enhancement are also discussed in Section 4. The Post-scheme Habitat Score is summarised in Tables 18 and 19.

Table 15: UK Habitat baseline habitat unit score with post-scheme areas and units

UK Habitat type	Habitat area baseline (ha)	Post-scheme Habitat Area Retained (ha)	Post-scheme Habitat area enhanced (ha)	Post-scheme Habitat area created (ha)	Post-scheme Habitat retained units	Post-scheme Habitat enhanced units
Modified grassland	0.1	0.1			0.23	0.00
Floodplain Wetland Mosaic (CFGM)	0.11		0.11		0.00	0.76
Floodplain Wetland Mosaic (CFGM)	3.81		3.55	0.27 (ponds)	0.00	48.99
Lowland meadows	2.87	2.87			52.81	0.00
Lowland dry acid grassland	0.46	0.46			8.46	0.00
Other woodland; broadleaved	0.7	0.7			6.44	0.00
Wet woodland	0.01	0.01			0.14	0.00
Reedbeds	0.84	0.84			5.80	0.00
Reedbeds	0.43	0.43	0.03		2.97	0.21
Reedbeds	0.36	0.36	0.01		4.97	0.14
Ponds (Priority Habitat)	0.06	0.06			0.83	0.00
Developed land; sealed surface	0.87	0.87			0.00	0.00
Total	**10.62**	**6.7**	**3.7**	**0.27**	**82.65**	**50.1**

Table 16: UK Habitat baseline river unit score with post-scheme lengths and units

UK Habitat type	Habitat baseline length (km)	Post-scheme Habitat length retained (km)	Post-scheme Habitat length enhanced (km)	Post-scheme Habitat retained units	Post-scheme Habitat enhanced units
Rivers (Priority Habitat)	0.32	0.16	0.16	2.00	2.00
Ditches	0.14	0.14		0.64	0.00
Total	**0.46**	**0.30**	**0.16**	**2.64**	**2.00**

Table 17: UK Habitat baseline hedgerow unit score with post-scheme length and units

UK Habitat type	Habitat baseline length (km)	Habitat length retained (km)	Habitat retained units
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.06	0.06	1.10

3.8 Post-scheme habitat score

Table 18 below provides a summary of the Sites post-development areas and lengths as well as the post-development habitat unit and hedgerow scores in line with the Biodiversity Metric 3.0 which should be read in conjunction with this document. Table 19 summarises the biodiversity baseline units and post scheme score.

Details of the habitat restoration and creation can be found in Section 3.

Table 18: UK Habitat baseline hedgerow unit score with post-scheme length and units

Combined habitat retention and enhancement			
	Habitats	**Hedgerows**	**Rivers**
Total area / length	10.67	0.06	0.46
Total units	136.39	1.10	4.65
Area / length retained	6.70	0.06	0.30
Units Retained	82.64	1.10	2.65
Area / length proposed for enhancement	3.70	0.00	0.16
Baseline units proposed for enhancement	50.09	0.00	2.00
Area / length lost	0.27	0.00	0.00
Units lost	3.66	0.00	0.00

Table 19: Biodiversity baseline units and post scheme

Net project biodiversity units (including all on-site & off-site habitat retention/creation)	**Habitat units**	13.32
	Hedgerow units	0.00
	River units	0.58

Total project biodiversity % change (including all On-site & Off-site Habitat Creation + Retained Habitats)	**Habitat units**	9.76%
	Hedgerow units	0.00%
	River units	12.51%

3.9 Trading Summary

The results of the metric indicate that the trading have been satisfied.

4.0 Discussion and conclusion

4.1 Biodiversity net gain overview

Overall, terrestrial habitat units on Site subject to retention, enhancement, or creation total **13.32** indicating a biodiversity net change increase of **9.76%,** River units onsite subject to retention, enhancement, or creation total **0.58** a net biodiversity change increase of **12.51%,** showing a positive gain for biodiversity units as a result of the proposed scheme.

4.2 Habitats on Site impacted by the scheme

Grassland and wetland habitats (assessed as having Poor to Moderate Condition) on site as detailed in Section 3 will be positively impacted by scheme proposals by reconnecting the Dearne to its original floodplain allowing a natural flooding regime through re-profiling bank sections along the northern bank of the river with additional wetland features to create seasonal standing water, expanding wetland habitats, aiding dispersal and extension in range of aquatic, semi-aquatic and visiting winter wading and wildfowl species on site.

Proposed works along the section of the Dearne on the southern boundary affords the opportunity to improve the aquatic, bank face, riverbed, and bank top habitats within this section. Gravel berms narrowing the channel will improve low flow velocities through the reach and increase in-channel flow diversity, helping to flush fine sediments from the bed, creating a more sinuous and natural section and increasing habitat for aquatic species. Coir matting installed to stabilise banks will be under sown with seed to enhance botanical communities.

Invasive species e.g., Himalayan balsam, scrub and noxious weeds will be controlled to prevent the species encroaching grassland areas of the Site.

Enhancement of this Site provides a positive strategic outcome of the objectives within the Dearne Valley Green Heart corridor for biodiversity.

4.2 Habitats on Site not impacted by the scheme

The habitats within the Site outside of the scheme and to be retained are considered to be of low distinctiveness (modified grassland), medium distinctiveness (broadleaved woodland), high distinctiveness (reedbed, wet woodland, ponds) to very high (lowland meadow and dry acid grasslands). The habitat area retained 6.71 ha representing 63% of the total area.

The small section (0.06 km) of hedgerow with trees and associated ditch on the Site boundary was assessed as good condition and will not be impacted by the scheme proposals.

4.3 Habitat management and monitoring

A 30-year Biodiversity and Enhancement Management Plan has been produced for the Site with details of the management and maintenance of restored habitats.

The management plan details how each habitat types affected by scheme proposals will achieve the target conditions to ensure their success. This is key to the Site achieving the score as set out in this report.

The Biodiversity Enhancement and Management Plan also includes details of the seed/plants to be used for each of the created habitat types. The species should all be from a local provenance and should be locally sourced where possible.

Regular monitoring is set out within the 30-year Biodiversity Enhancement and Management Plan for this Site. It will be undertaken by a suitability qualified ecologist or landscape professional who will be able to provide details on the species present and suggest remedial measures to improve the habitats condition in line with the target condition provided in the metric as well as timings.

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