



**Sheffield &  
Rotherham**

# Management Brief for Kilnhurst Ings

DRAFT 1

April 2018 – Dec 2021

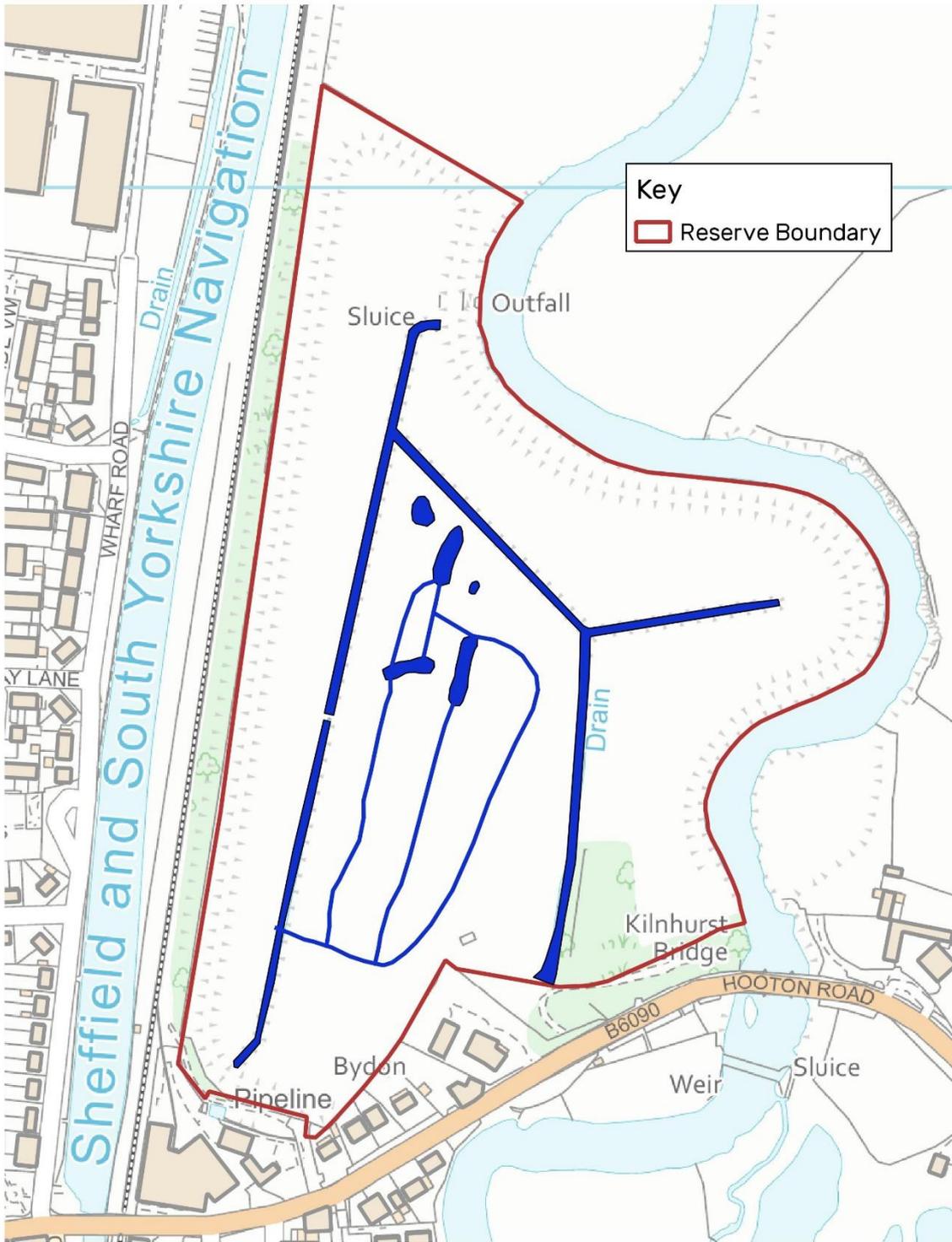
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# Contents

## Table of Contents

1. Introduction.....	11
1.1 Structure of the plan .....	11
2. Site Description .....	12
2.1 General Information.....	12
2.2 Environmental Information.....	14
2.3 Biodiversity.....	15
Table 1: BAP Priority habitats and species.....	15
Table 2. Birds of Conservation Concern Recorded on Kilnhurst Ings.....	18
3. Vision and Features .....	21
3.1 Vision .....	21
3.2 Feature 1: Breeding snipe.....	22
3.3 Feature 2. Open water habitat.....	25
3.4 Feature 3. Bird community.....	28
3.5 Feature 4. Brimstone population .....	32
3.6 Feature 5. Water vole.....	34
3.7 Feature 6. Public access and information. ....	35
4. Work Programme .....	38
5.Figures .....	39

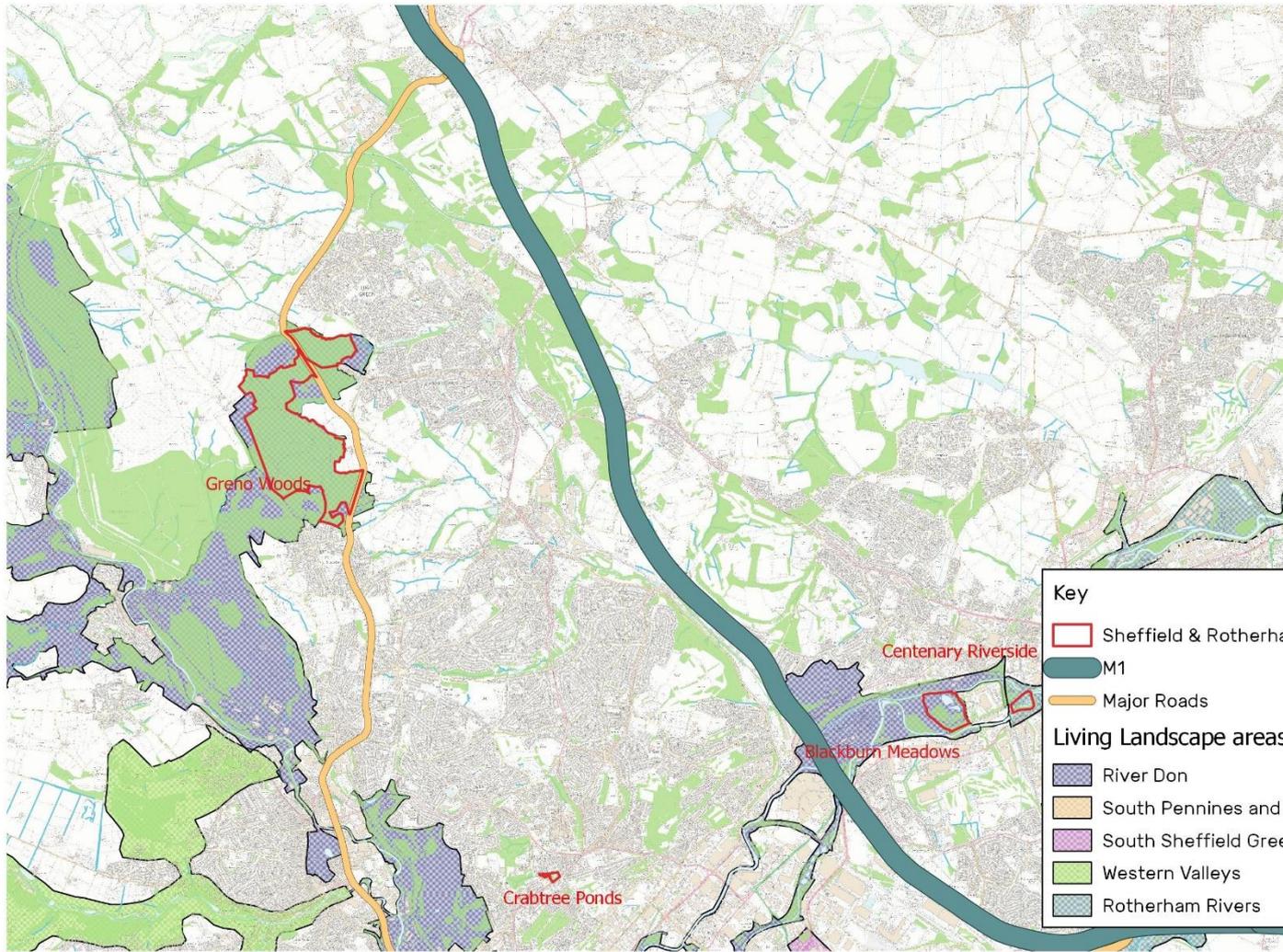


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**Key**

- Sheffield & Rotherham Wildlife Trusts
- M1
- Major Roads

**Living Landscape areas**

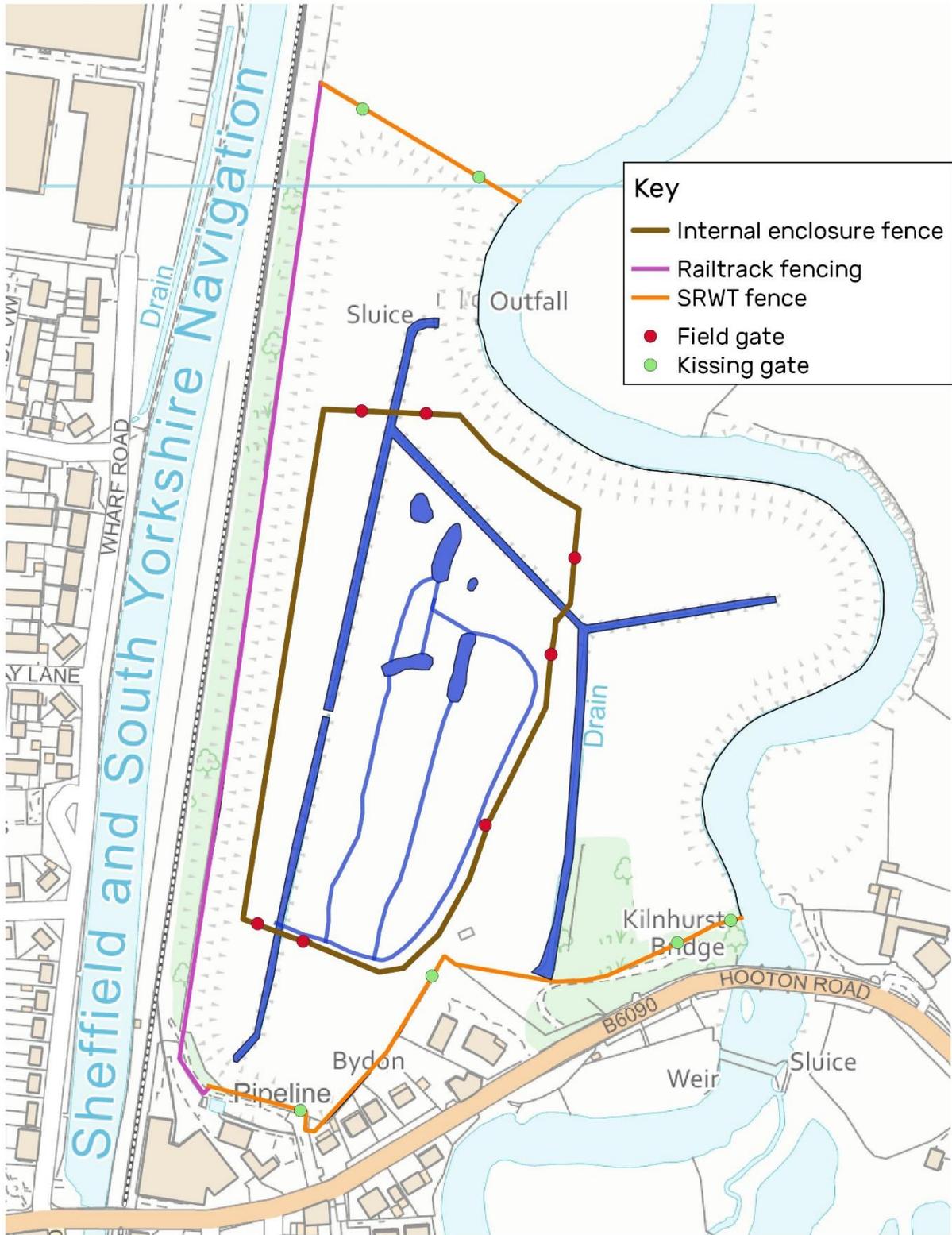
- River Don
- South Pennines and
- South Sheffield Green
- Western Valleys
- Rotherham Rivers

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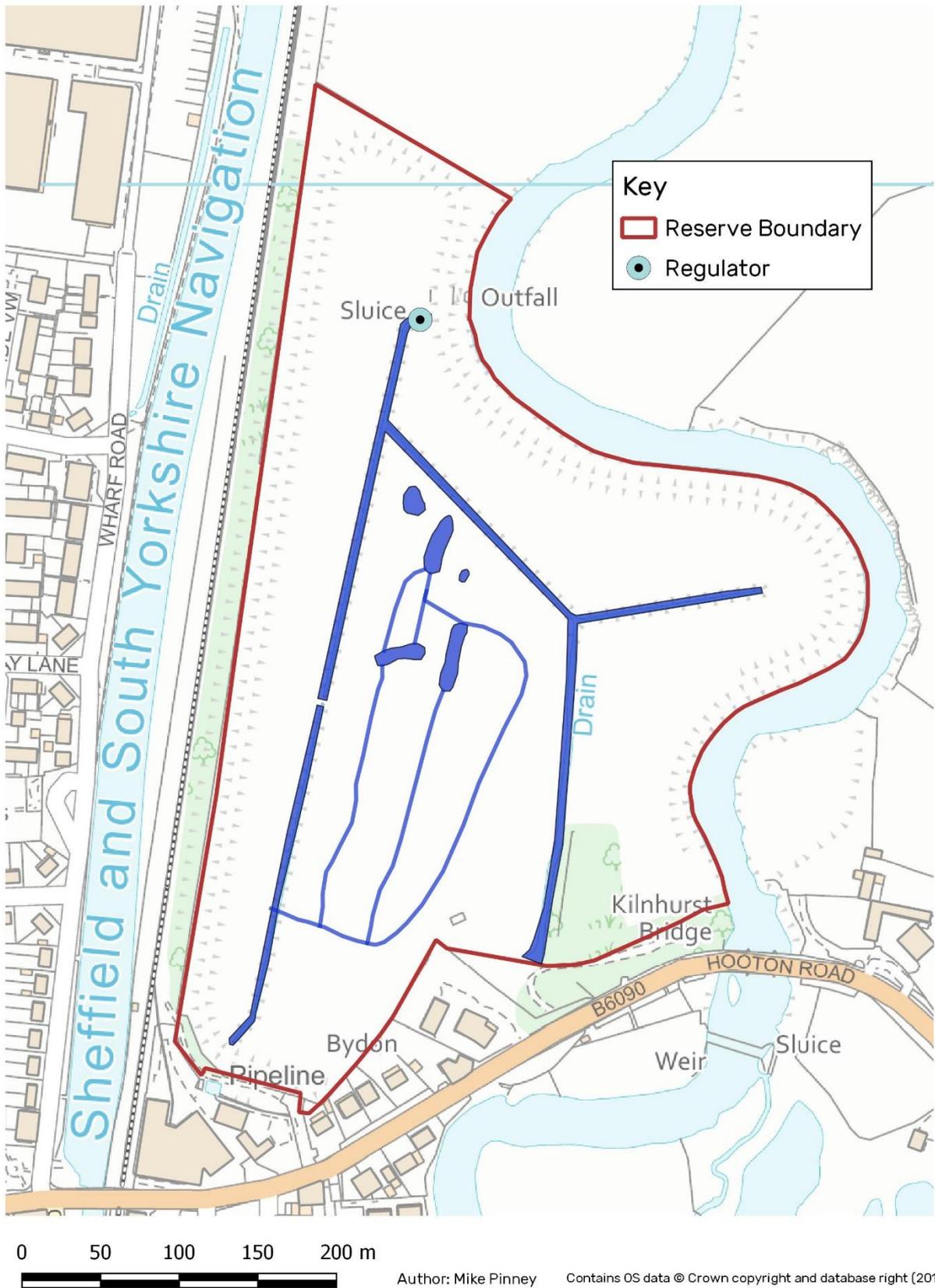


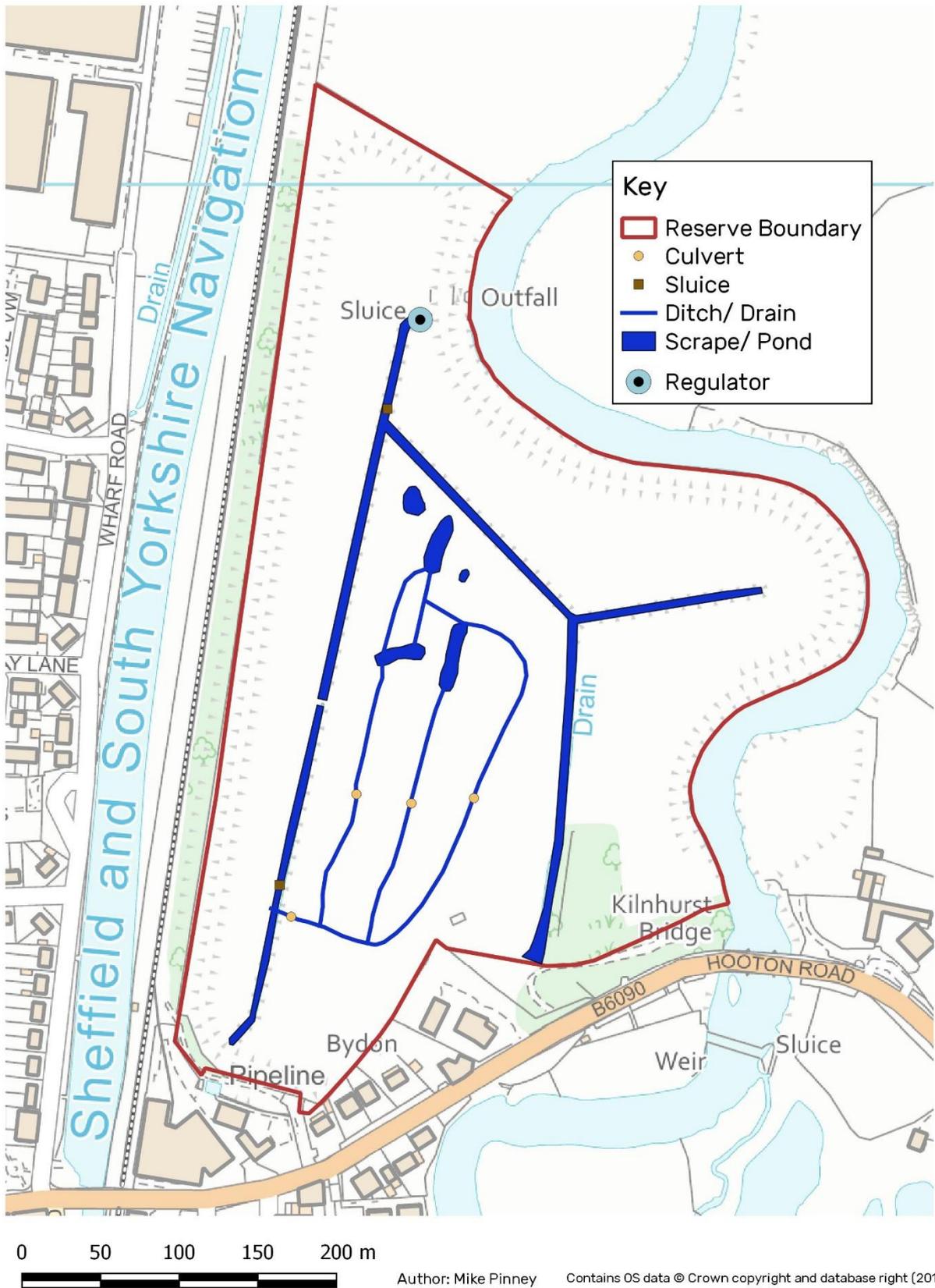
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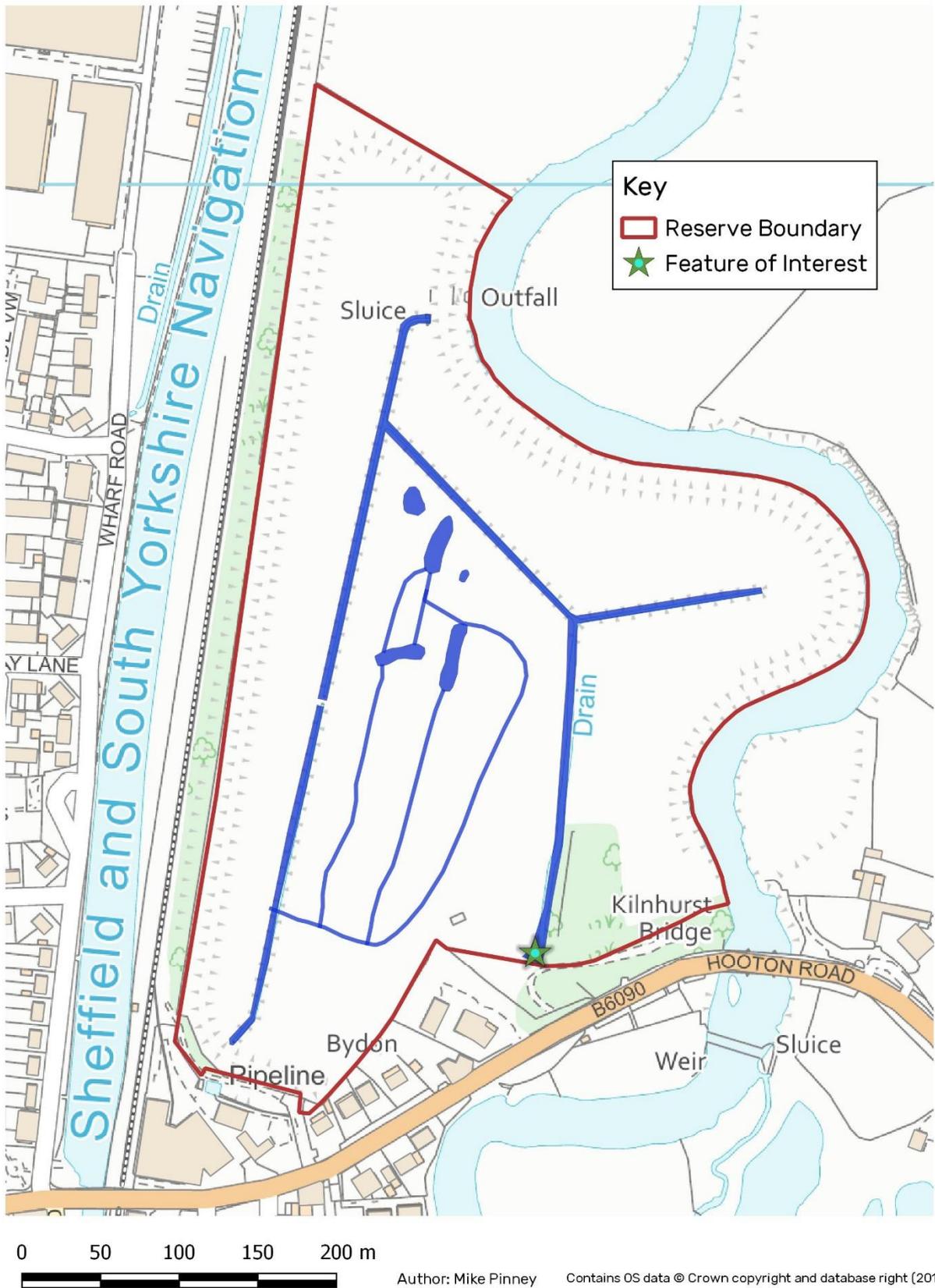
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.....	45
APPENDIX I: Glossary of Acronyms and terms .....	50
APPENDIX II SUMMARY OF PROPOSED MONITORING.....	51

APPENDIX III: Operational Standards and Techniques .....	52
Management of grazing .....	52
Biosecurity .....	52
Archaeology.....	52
Protected species .....	52
Veteran and Notable Trees .....	52
Water Management .....	52
Use of pesticides and fertilisers .....	52
Waste disposal and pollution .....	53
Emergency procedures.....	53
Flood bank maintenance .....	53
Public Access and information .....	54

# 1. Introduction

Sheffield and Rotherham Wildlife Trust is part of a national association of 46 local Wildlife Trusts, which work with communities throughout the UK to protect wildlife in town and country. Our vision is to see a Living Landscape – an amazing, green landscape for the wildlife and people of Sheffield and Rotherham, a landscape which is understood, enjoyed and cared for by local people and organisations.

This management Brief has been formulated to:

- Provide an overview about the nature reserve in one document, with reference to other documents where necessary;
- To outline the key long-term aims and the associated objectives which form the framework of management;
- To outline the rationale for management so as to give a clear explanation of why aspects need management and in what form that management will take;
- To provide a key document from which projects are developed and associated funding sought;
- To provide consistency and continuity, so that when changes of staff take place, or changes in ownership or disposal of the land occurs, then management aims, objectives and prescriptions are continued.

The work programme is set out within this document. However, the nature of work programmes is such that they vary and are modified due to unanticipated changes or developments such as the availability of funding. Therefore the full annual work programmes are kept and updated electronically at the SRWT offices.

## 1.1 Structure of the plan

This management plan is divided into sections.

**Section 1** gives an overview of the plan

**Section 2** provides a detailed description of, the reserve.

**Section 3** of the plan gives the Trust's **vision** for the reserve: the condition we are aiming to achieve by 2070. It then lists the reserve's **features**, the most valued elements of the site for which it is managed.

For each feature, a number of **attributes** and **factors** is then identified. **Attributes** are measurable qualities of a feature, against which its condition will be monitored in order to judge the effectiveness of management. **Factors** are anything that has the potential to influence or change a feature, or to affect the way in it is managed.

Once the attributes and factors affecting a feature have been identified, each feature is then **evaluated**. During evaluation, the current condition of the feature is compared to that contained in the vision and its performance against the attributes identified discussed. The impact of factors – which can be positive or negative – on the feature, or its management, are likewise evaluated. From this evaluation **management objectives** are then set.

**Section 4** comprises the work programme where the management prescriptions for the features are listed.

**Section 5** of the plan comprises the **Figures**: maps that accompany the text.

Section 6 of the plan are the **Appendices**, where supporting information is given.

## 2. Site Description

### 2.1 General Information

#### Location and extent

Kilnhurst Ings is located on Rotherham's north-eastern fringe and lies between the River Don and the Kilnhurst Cut of the South Yorkshire Navigation. It covers an area of 15.3 hectares and is centred on OS Grid Reference SK 465 975 (**Figures 1 & 2**).

#### Site Designation and Policy Context

Kilnhurst Ings is a washland, owned by the Environment Agency for the purposes of managing flood risk. As such, no modification of the reserve that limits or lowers its capacity to take in and hold water in times of flood is permitted.

The Reserve also falls within a **Nitrate Vulnerable Zone**. This is a conservation designation of the Environment Agency for areas of land that drain into nitrate polluted waters, or waters which could become polluted by nitrates. Monitoring of the nitrate input to the reserve is carried out under the reserve's Higher Level Stewardship (HLS) agreement.

The reserve is also designated as a **Sand and Gravel Mineral Safeguarding area** and a **Local Wildlife Site** under Rotherham's Local Plan.

#### Site safety, security and maintenance

A site specific risk assessment has been written for Kilnhurst Ings and is reviewed on an annual basis. The Trust also manages the reserve in line with its policies covering environmental management and Health & Safety. These are amended and updated at regular intervals or to reflect legislative changes.

Kilnhurst Ings is regularly patrolled by SRWT staff and volunteers. Any problems noted during patrols or reported by members of the public, are logged and addressed as soon as possible.

Tree inspections for the entire site are carried out every six years. Associated remedial work is undertaken as recommended by the surveyor.

Kilnhurst Ings's boundaries are marked and secured by fencing, only parts of which are the responsibility of SRWT (**Figure 3**). Access points to the reserve are provided with gates to allow access by management vehicles whilst excluding entry to other vehicles (cars, quad bikes and motorcycles).

No litter bins or dog waste bins are present on site. The installation of litter/dog waste bins on site has been discounted due to the cost of collections.

#### Adjacent Land Ownership

The land surrounding Kilnhurst Ings is owned, or tenanted by a variety of people and organisations. The majority of land is either under use for transport or light industry.

#### Services and Easements

No overhead power lines or underground services are recorded as being present on the reserve.

A regulator valve, designed to lower water levels following flooding, is present on the northern part of the site (**Figure 4**).

The Environment Agency retain full access rights to the whole of Kilnhurst Ings, to carry out maintenance of the regulator and flood defence banks and to carry out site inspections.

Railtrack have an easement across the site from Hooton Road for the maintenance of rail infrastructure on the adjacent line (**Figure 4**). .

### **Rights of Way and access infrastructure**

No statutory footpaths or bridleways are present on site, although access is allowed at many points and a number of well used desire lines are present. None of the desire lines are surfaced.

Public access to the reserve is by one of 6 kissing gates (**Figure 3**).

There are no benches, waymarkers or other access infrastructure on the reserve.

A defunct interpretation panel and an interpretative wooden carving are present at the southern entrance to the reserve, adjacent to the fishermen's car park.

### **Current Funding**

The reserve is under contract with Countryside Stewardship for the period 2016 – to 2021.

## 2.2 Environmental Information

### Topography

The reserve is situated immediately west of the River Don at a height of between 10 and 20m OD and within the floodplain of the River Rother. The reserve is largely flat, with the flood defence banks rising to a height of 20m.

### Geology and Soils

Kilnhurst Ings nature reserve lies on the sand and gravel beds of the River Don. These deposits are overlain with alluvium across much of the reserve as a result of repeated flooding events.

### Hydrology

Kilnhurst Ings is a locally wet site, receiving water from Collier Brook and drained by the River Rother. It supports a number of artificial wetland features such as ditches, ponds and scrapes (**Figure 5**).

The River Don forms the reserve's eastern boundary, flowing from south to north between steep banks. The reserve is designed to act as a flood storage area: in times of high water levels in the River Don, the river can burst its banks onto the reserve at its south-eastern corner and inundate the area (adjacent sites are protected by a flood-defence bund). When water levels in the river fall again, the reserve can then be drained by means of a regulator to the north-east.

Climate change models predict that the Yorkshire and Humber area will become warmer and drier as the century progresses. In particular, it is predicted that rainfall will become more seasonal (heavier rainfall in winter, lighter in summer) and also that extreme weather events will become more common. Kilnhurst's role as an area capable of absorbing and storing excess water is therefore likely to become increasingly important.

## 2.3 Biodiversity

### Biodiversity Action Plans

The reserve is covered by the National and RMBC Biodiversity Action Plans (BAPs) and supports a number of priority habitats and species, as summarized in the table below:

Table 1: BAP Priority habitats and species

UK BAP Priorities	
Habitats	Species (short and medium list only)
Rivers and streams	<b>Water vole</b> ( <i>Arvicola terrestris</i> )*
Lowland meadows	<b>Cuckoo</b> ( <i>Cuculus curculus</i> )
Floodplain grazing marsh	<b>Lesser redpoll</b> ( <i>Acanthis caberet</i> )
Ponds	<b>Linnet</b> ( <i>Linaria cannabina</i> )
	<b>Skylark</b> ( <i>Alauda arvensis</i> **)
	<b>Song thrush</b> ( <i>Turdus philomelos</i> )
	<b>Willow tit</b> ( <i>Poecile montanus</i> **)
	<b>Yellowhammer</b> ( <i>Emberiza citronella</i> )
	<b>Bullfinch</b> ( <i>Pyrrhula pyrrhula</i> )
Rotherham BAP Priorities	
Grassland (lowland meadows)	
Wetlands (ponds, eutrophic standing water, floodplain grazing marsh)	
Rivers	

\* Historic records; now extinct on reserve.

\*\* Records believed to originate from adjacent site with the same name.

Species highlighted in bold are on the UK short list of globally threatened and declining species.

31 bird species that have been red-listed as birds of Conservation Concern by the British Trust for Ornithology, have been recorded as being present on site. These are discussed further in section 4.3.5 below.

### Habitats and Species

Kilnhurst Ings nature reserve forms one part of a chain of remnant and secondary wetland sites set in an industrial landscape along the River Don. When classified using the JNCC's guidelines for Phase One Habitat surveys, the reserve contains a variety of natural and semi-natural habitats, including plantation woodland, scrub, neutral grasslands, marshy grassland, swamp and standing open water (**Figure 6**). These are described and evaluated below.

The reserve is currently grazed by Aberdeen Angus cattle, at a rate of 1.3 livestock units a hectare, between April and end October each year.

## Grassland

Grassland is the dominant habitat type present on the reserve. The grasslands of Kilnhurst Ings fall into two categories –large expanses of poor semi-improved grassland interspersed by areas of marshy grassland which form wherever groundwater is high.

The majority of the site, including the raised flood defence banks is neutral semi-improved grassland with a poor species diversity. Perennial rye grass (*Lolium perenne*) is abundant in the sward, which also contains cock's foot (*Dactylis glomerata*), crested dog's tail (*Cynosaurus cristatus*), creeping bent (*Agrostis stolonifera*) and Yorkshire fog (*Holcus lanatus*). White clover (*Trifolium repens*) and creeping thistle (*Cirsium arvense*) are frequent within the sward, with occasional nettle (*Urtica dioica*), ragwort (*Senecio jacobaea*), broad-leaved dock (*Rumex obtusifolius*) and common sorrel (*Rumex acetosa*) in the main body of the grassland and common cat's ear (*Hypochaeris radicata*), red clover (*Trifolium pratense*), ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*) and common knapweed (*Centaurea nigra*) on the flood defense banks.

Similarly, the marshy grassland is generally species-poor, with abundant soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*) and occasional tufted hair grass (*Deschampsia cespitosa*). Very small quantities of hydrophilic herbaceous plants, for example amphibious bistort (*Persicaria amphibia*), marsh cudweed (*Gnaphalium uliginosum*), trifid bur-marigold (*Bidens tripartita*) and marsh ragwort (*Senecio aquaticus*), are also present.

## Swamp, ponds and marginal vegetation

There are three main established interconnecting drains on the reserve; these long-established drains are characterised by a good assemblage of aquatic vegetation, including species such as gypsywort (*Lycopus europaeus*), soft rush, reed canary grass (*Phalaris arundinaceae*), water plantain (*Alisma plantago-aquatica*), marsh foxtail (*Alopecurus geniculatus*), floating sweet grass (*Glyceria fluitans*), sharp-flowered rush (*Juncus acutiflorus*) and jointed rush (*Juncus articulatus*).

In addition to these, a number of new ditches and drains were excavated in 2016. These link both to the established drains and a series of new ponds and scrapes. These new drains are currently only seasonally wet and support a community of soft rush, with bare earth still common.

The reserve's ponds are also still in the early stages of vegetation colonisation and currently support little marginal or aquatic vegetation.

## Woodland and scrub

The wooded area adjacent to Hooton Road comprises mature sycamore (*Acer pseudoplatanus*) with some elder (*Sambucus nigra*) in the understory. This woodland is a popular resting area for the site's cattle, and in consequence, soil nutrient levels are high and the ground flora is rank and dominated by common nettle and cleavers (*Galium aparine*) in the field layer. The woodland extends up along the east drain, where there is a large extent of aspen (*Populus tremula*) at the northern extreme of the woodland, before dense hawthorn scrub becomes more dominant.

A number of large crack willow (*Salix fragilis*) are present on the banks of the River Don.

## Bare ground

Areas of bare ground are present on the reserve, due either to poaching by cattle, or over-shading by trees or recent in the drawdown zones of ditches and ponds. Small areas of bare ground are desirable for many types of wildlife. Plant seeds require them to germinate, whilst many invertebrates will use them for basking or ovipositing and others require them for mineral licks. Soft, invertebrate-rich mud provides a vital feeding resource for wading birds such as common snipe (*Gallinago gallinago*). However, large expanses of bare ground, whilst inevitably created during ground works, are not desirable in the long term. Consequently, care will be taken to ensure that the cattle-grazing season is strictly adhered to, with **cattle removed from site promptly at the end of October**, or earlier if feed becomes sparse or conditions are particularly wet.

## Invertebrates

The range of habitats present on site provide food and shelter for a variety of invertebrates. Its wetland habitats support the greatest diversity of species, including many that are wholly or partially aquatic.

A sweep survey of the ditch system in 2014 identified a number of aquatic invertebrate species. These included a number of freshwater molluscs, several species of diving beetle and nymphs of the blue-tailed damselfly (*Ischnura elegans*) and azure damselfly (*Coenagrion puella*). Some of the species found, for example members of the meniscus midge family, are indicators of unpolluted water.

Adult brimstone butterfly (*Gonepteryx rhamni*) have been recorded on the reserve.

A reserve's invertebrate fauna is a key indicator of its importance for biodiversity. Invertebrates form an important part of the food chain, for many other species of conservation importance such as wading birds and bats. Maintaining its range of habitats, particularly its wetland and grassland habitats in a condition friendly to invertebrates is therefore of vital importance, meaning that **any management that decreases the net amount of water held on site, overgrazing and the use of pesticides (including vermicides) will be avoided.**

## Fish, Reptiles and Amphibians

No records for fish, amphibians or reptiles are held for Kilnhurst Ings. It should be noted that the reserve contains suitable habitats for common toad (*Bufo bufo*) and common frog (*Rana temporaria*) and these are likely to be present on site.

## Avifauna (bird life)

The variety of habitats on the reserve, its position on the River Don living landscape area and position relative to other natural areas all give Kilnhurst Ings the potential to become a high quality site, supporting a varied avifauna.

86 species of bird have been recorded on or flying over Kilnhurst Ings, or in the river adjacent to the reserve. However it is not clear how many of these records refer to the Kilnhurst Ings site covered by this plan, and how many refer to records made on adjacent pieces of land also referred to by this name. 9 of the species recorded are red listed on the British Trust for Ornithology's Birds of Conservation Concern, meaning that they are experiencing widespread population declines in the UK. A further 22 are amber listed under the same system. These species are shown in the table below:

**Table 2. Birds of Conservation Concern Recorded on Kilnhurst Ings**

Red Listed		Status on site	Amber Listed		Status on site
Cuckoo	<i>Cuculus canorus</i>	FO	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	R
Grey Wagtail	<i>Motacila cinerea</i>	R	Bullfinch	<i>Pyrrhula pyrrhula</i>	A
Lesser redpoll	<i>Acanthis cabaret</i>	R	Dunnoek	<i>Prunella modularis</i>	R
Linnet	<i>Linaria cannabina</i>	R	Gadwall	<i>Anas strepera</i>	OR
Mistle Thrush	<i>Turdus viscivorous</i>	R	Green Sandpiper	<i>Tringa ochropus</i>	R
Sky Lark	<i>Alauda arvensis</i>	A	Kingfisher	<i>Alcedo atthis</i>	R
Song Thrush	<i>Turdus philomelos</i>	R	Kestrel	<i>Larus fuscus</i>	R
Willow Tit	<i>Poecile montanus</i>	A	Mallard	<i>Anas platyrhynchos</i>	OR
Yellowhammer	<i>Emberiza citrinella</i>	R	Meadow Pipit	<i>Anthus pratensis</i>	R
			Mute Swan	<i>Cygnus olor</i>	OR
			Osprey	<i>Pandion haliaetus</i>	FO
			Oystercatcher	<i>Haematopus ostralegus</i>	FO
			Pink-footed goose	<i>Anser brachyrhynchus</i>	R
			Redshank	<i>Tringa totanus</i>	OR
			Reed Bunting	<i>Emberiza schoeniclus</i>	RB
			Shelduck	<i>Tadorna tadorna</i>	R
			Shoveler	<i>Anas clypeata</i>	R
			Snipe	<i>Gallinago gallinago</i>	R
			Stock dove	<i>Columba oenas</i>	R
			Swift	<i>Apus apus</i>	FO
			Whooper swan	<i>Cygnus cygnus</i>	R
			Willow Warbler	<i>Phylloscopus trochilus</i>	R

FO – Flew over OR – On river R=recent records of site use (post 2005) RB = known to have bred on site since 2005 A – species believed to have been recorded on an adjacent site

As can be seen from the table above, none of the red listed and only one of amber listed species –reed bunting -are confirmed as breeding on the reserve. However, the paucity of breeding bird data for the site means that this may be an under-estimate. Snipe, song thrush, grey wagtail, linnet, yellowhammer and mistle thrush are seen on site throughout the year and it is possible that one or more of these species may also be resident breeders. For others, the reserve may form one of a series of feeding sites, allowing the species to persist in the locality.

As well as species that require wet grassland and swamp, the supports a number of birds of open and flowing water, including mute swan, whooper swan, kingfisher, shoveler, shelduck and pink-footed goose. Mute swan populations are increasing since the sale of lead angling weights and is limited in the Kilnhurst area by the availability of breeding territories. Whooper swans are winter visitors and do not breed in the UK.

The reserve's grassland and scrub habitats supports a number of species typical of many wooded sites across the Rotherham area, and additionally a number of species which, due to severely declining populations, are no longer typical elsewhere. These include the red and amber listed species song thrush, mistle thrush, dunnoek, yellowhammer, linnet and willow warbler are resident or migratory breeders.

## Mammals

Little is known about the reserve's mammalian fauna, which is believed to be scarce and species-poor. Water vole were previously known to be resident on site but the population, along with others along the river, was lost during the 2007 floods and no records of this species being present on site after this event have been reported

Otter (*Lutra lutra*) have not been recorded on the reserve or in the adjacent river, however, as populations increase both nationally and regionally, it is likely that this secretive species is already present but unrecorded, or likely to recolonise in the near future. Otter are a semi-aquatic species, which travel over large areas (both in and out of water) and feed on fish (particularly eels and salmonids, as well as frogs and water birds. Should the species recolonise, measures for the good management and extension of wetland habitats outlined elsewhere in this plan will provide valuable feeding grounds. Measures to increase vegetation along the riverbank would also prove beneficial by providing quiet daytime refuges.

The visitor survey for the reserve should be repeated in 2022.

## 2.4 Cultural Context

### Site Archaeology

Little archaeological remains are known to exist within the vicinity of the site. Prehistoric activity in the area is attested to by the findspot of a Late Bronze Age hoard located approximately 200m to the west of the site (South Yorkshire HER no. 00830/01).

No further archaeological evidence is known until the post-medieval period. Approximately 50m to the south-east of the site is the location of Kilnhurst Forge, (South Yorkshire HER no.03881/01). The forge no longer exists, but the remains of the sluice and weir are still extant in the river. A tail goit present on the reserve forms part of this feature (**Figure 7**) and will be protected during any works on the reserve (Appendix III).

Another site, Kilnhurst Bridge Pottery Works, exists approximately 150m to the south-west of the site (South Yorkshire HER no. 03617/01). Established around 1784, by 1854 the property included a biscuit kiln, gloss kiln, greenhouse, hot house, black kiln, white throwing house and several warehouses. It closed shortly after 1863.

Historic mapping from the 19<sup>th</sup> century onwards shows that the site has remained undeveloped, open land since the mid-19<sup>th</sup> century.

## **Recreation**

Kilnhurst Ings is a quiet site, with limited recreational activity. The reserve is valued by local people for recreational pastimes such as fishing and dog walking. There are few issues with vandalism or littering. Dog fouling is not a major problem on site.

A local angling group maintains a private car park on the reserve's southern boundary, its members then enter the reserve at its south-eastern corner and fish along the river. Canoeists are also active on the river.

Walkers, and in particular, dog walkers are the most frequent visitors to the reserve. The majority of visitors walk a circuit along the flood defence bunding, although some pass through the reserve to access sites to the north.

On street car parking for visitors to Kilnhurst Ings is available at southern boundaries of the reserve.

## **Community and community engagement**

Kilnhurst Ings lies in the newly created ward of Kilnhurst and Swinton East. Prior to 2019 the reserve formed part of Silverwood Ward, and the following information is derived from this ward profile.

The area is largely rural, with the majority of the population living in one of 4 urban areas, of which the closest to the reserve is the community of Kilnhurst. The ward's population declined slightly between 2011 and 2017, with the age structure of the population largely mirroring that of Rotherham as a whole. The population of the area is largely white British (92%), with the proportion of BME residents (3%) less than half the borough average. Housing in the ward is largely owner-occupied, with 67% of the population in work. Rates of poor health and/or disability are slightly below the borough average.

The Trust has previously worked with the Don Catchment Trust to carry out a litter pick on the reserve, and has had contact with a number of regular reserve users regarding its management.

## **Interpretation and Signage**

An interpretative wooden sculpture of a salmon is present at the entrance adjacent to the car park. A defunct information panel is also present at this location. There is currently no SRWT signage on site.

## **Outdoor Learning**

Kilnhurst Primary School lies adjacent to the reserve and pupils have visited the Ings to take part in educational activities. However, the presence of cattle on site between April and October, and the sensitivity of the central part of the reserve for ground-nesting birds between April and July mean that the reserve is unsuitable for school visits during these times of year.

## 3. Vision and Features

### 3.1 Vision

Our vision for Kilnhurst Ings by 2070 is:

Kilnhurst Ings is a small (15.3 ha) washland, containing a mosaic of wildlife-rich habitats.

The reserve provides a varied mosaic of wetland habitats for wading bird species, including snipe which breed on the reserve. The reserve's water bodies are clean and support a variety of wetland plants, and a rich aquatic invertebrate fauna, including more than 10 species of dragonflies and damselflies. A population of water vole are present on the reserve.

Kilnhurst Ings supports a diverse bird community including breeding bullfinch, linnets, yellowhammers and tree sparrows. Kingfisher, mute swan and shovellers are frequently sighted along the river corridor, and make use of the lush bankside vegetation. A colony of brimstone butterflies is present on site.

Hydrological management and conservation grazing maintain the reserve's important floral and faunal communities.

The local community access the reserve for walking and fishing and are supportive of the conservation management of the site. Dogs are welcome on the reserve but are kept under close control, especially during the bird breeding season.

### 3.2 Feature 1: Breeding snipe

Presence of  $\geq 1$  pairs breeding snipe (*Gallinago gallinago*).

#### Attributes

<u>Attribute</u>	<u>Performance Indicators</u>	<u>Monitoring</u>
<b>Presence/ absence of breeding pairs of snipe</b>	$\leq 1$ pair snipe breeding bw May and June	Territory mapping
<b>Vegetation within central wetland reservation:</b>	<p>60-70% of the area should consist of tall 50cm-80cm, tussocky rushes.</p> <p>30-40% of the area should have a sward height &lt;15cm.</p> <p>30% of the area should have moist soil (so that 6 inch nail can be pushed into the ground with ease) and/or standing water (excluding ponds and ditches).</p> <p>Bare ground should score <math>\leq 1</math> (rare) within each 50x50m grid square.</p>	Vegetation monitoring

## **Factors**

A factor is anything that has the potential to influence or change a feature, or to affect the way in which a feature is managed.

<b>Factors</b>	<b>Rationale</b>	<b>Management Required (Yes/no/monitor)</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>
Grazing regime	A site's grazing regime – the animals used, the intensity of grazing and the grazing season – can all affect sward height and composition, thereby either creating or destroying suitable breeding areas for wading birds.	Yes	Vegetation within central wetland reservation is grazed by cattle between June-Sept/October to produce the sward features listed above.	Vegetation monitoring  Casual observations by Reserve Manager
Soil moisture levels	Soil moisture levels affects the supply of invertebrate prey for wading birds.	Monitor	30% of the area should have moist soil (so that 6 inch nail can be pushed into the ground with ease) and/or standing water (excluding ponds and ditches).	Vegetation monitoring
Disturbance by people, dogs and cattle	Snipe are ground nesting birds, and, as such, are vulnerable to disturbance by people, cattle and especially dogs, during the breeding season.	Yes	No passage through the central wetland area for people, cattle or dogs during April and May.  Access to central wetland area for people and dogs discouraged at all times.	Informal monitoring through Wildlife Trust patrols

### **Evaluation of current condition**

Snipe do not currently breed at Kilnhurst Ings, nor are they recorded as breeding on the reserve in recent years. This lack of breeding success reflects the paucity of suitable breeding habitat on the reserve, coupled by disturbance by people, dogs and cattle during the bird breeding season. Habitat suitable for breeding snipe is now being created following the creation of a new network of ditches, ponds and scrapes rewetting the central area of the reserve during 2016 and 17 and the fencing off of this area during 2018 (Figure 8). This fencing will allow the grazing of the wetland area to be more closely controlled, allowing the correct sward heights to be achieved and will also prevent disturbance to breeding snipe by excluding people, dogs and cattle from the area (as from 2020). It is therefore anticipated that the conditions necessary for snipe to breed will be met by 2020.

### **Management Objectives**

#### **1.0 Presence of $\geq 1$ pairs breeding snipe (*Gallinago gallinago*) per annum by 2020**

For management prescriptions see 4.0 Work Programme.

All works to be carried out in compliance with the directory of Operational Standards and Techniques given in Appendix III.

### 3.3 Feature 2. Open water habitat

Reserve supports 0.8ha open water (ponds, scrapes and ditches) in good ecological condition.

#### Attributes

<u>Attribute</u>	<u>Performance Indicators</u>	<u>Monitoring</u>
<b>Open water habitat</b>	Retention of ponds and scrapes covering 0.8ha Ponds must hold water all year. Scrapes must be seasonally wet (October-June). Submerged and marginal vegetation between 25%-75% cover. Marginal scrub <25% Presence of ≥10 Odenata species (adults).	Remote sensing Dragonfly monitoring

#### Factors

<b>Factors</b>	<b>Rationale</b>	<b>Management Required (Yes/no/monitor)</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>
<b>Pollution of watercourse</b>	The wetland area on Kilnhurst is fed by the Collier Brook, which flows through Kilnhurst before it enters the reserve. Contamination of this watercourse would therefore result in a decrease in water quality in the reserve's wetlands.	Monitor	Presence of ≥10 Odenata species	Dragonfly monitoring
<b>Factors</b>	<b>Rationale</b>	<b>Management Required</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>

		(Yes/no/monitor)		
<b>Flooding events</b>	Kilnhurst Ings acts as a flood storage area for the River Don. In times of spate the Don may therefore flood the central area of the reserve, leading to impacts on its vegetation and wildlife due to a) the flooding event itself, b) the deposition of sediments (increased nutrient load and possible contamination by sewage, heavy metals etc) .	Monitor	N/A	EA recording of flood events
<b>Climate change</b>	<p>Global temperatures are predicted to continue rising over the course of the century. Although the exact effect on the climate of the UK is not known, it is thought that the result is likely to include to an increase in climatic variability, with extremes in temperature, wind speed and rainfall becoming more common. Consequently, increasing the reserve's resilience to drought and spring inundation should be a consideration when management decisions are made.</p> <p>Long-term changes in climate may affect the species which the reserve is able to support long-term and future species conservation plans will need to take this into account.</p>	Monitor	<p>No loss of wetland habitats across the reserve.</p> <p>Soggy ground or shallow water (to a maximum depth of 10 cm) covers no more than 30% of the central wetland area during April-July..</p>	<p>Vegetation monitoring</p> <p>Remote sensing</p>

### **Evaluation of current condition**

The reserve's wetland features currently have high water quality. Having recently been created, the newer features are currently in the early stages of vegetational succession and are therefore ecologically less diverse than the more established ditches, a factor which will change in time.

The lower (northernmost) sluice on Collier Brook is leaking. This leak will be fixed, to increase water retention across the wetland area.

### **Management Objectives**

**Reserve supports 0.8ha open water (ponds, scrapes and ditches) in good ecological condition.**

For management prescriptions see 4.0 Work Programme.

All works to be carried out in compliance with the directory of Operational Standards and Techniques given in Appendix III.

### 3.4 Feature 3. Bird community

**Reserve supports a diverse bird community, with bullfinch, linnet, yellowhammer, tree sparrow, kingfisher, mute swan and shoveler present on the reserve by 2034.**

#### Attributes

<u>Attribute</u>	<u>Performance Indicators</u>	<u>Monitoring</u>
Breeding bullfinch	Bullfinch present on the reserve during the breeding season. ≥ 6 wild cherry trees present on the reserve.	Casual records
Breeding linnet	Linnet present on the reserve during the breeding season. 5% of reserve covered in dense, thorny scrub.	Casual records Remote sensing
Breeding yellowhammer	Yellowhammer present on the reserve during the breeding season. 5% of reserve covered in dense, thorny scrub.	Casual records Remote sensing
Feeding kingfisher	Kingfisher feeding along Don on reserve boundary. Riverbank supports trees and scrub as perching features	Casual records
Breeding mute swan	Mute swan present on the river adjacent to the reserve during the breeding season Dense vegetation present along 50% riverbank.	Casual records
Breeding shoveler	Shoveler present on the reserve during the breeding season. Dense vegetation present along 50% riverbank.	Casual records

## **Factors**

A factor is anything that has the potential to influence or change a feature, or to affect the way in which a feature is managed.

<b>Factors</b>	<b>Rationale</b>	<b>Management Required (Yes/no/monitor)</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>
Disturbance by people, dogs and cattle	Closing the reserve's central wetland area during April and May concentrates people, cattle and dogs in peripheral areas where these birds will be breeding.  Mute swan and shoveler are ground nesting birds, and, as such, are vulnerable to disturbance during the breeding season. Providing adequate cover for these species is therefore a priority, if breeding success is to be assured.	Yes	50% riverbank densely vegetated.	Remote sensing
Lack of nest sites/food on site	The amount of scrub on site is currently limited. This in turn limits feeding and nesting opportunities for bullfinch, linnet, yellowhammer and tree sparrow.	Yes	5% reserve covered in dense, thorny scrub.	Remote sensing
Local population size of bullfinch, linnet, yellowhammer and tree sparrow.	Kilnhurst Ings is a relatively small site, and is too small to support large numbers of breeding pairs of any bird species. The ability of the reserve to support the species listed will therefore be partially dependent on the size of their population locally. If these species suffer a contraction in their range through a loss of suitable breeding and feeding sites in the vicinity, this will impact on their presence on the reserve.	Monitor	Local population levels maintained	BTO survey reports

## **Evaluation of current condition**

Bullfinch, linnet, yellowhammer, kingfisher, mute swan and shoveler have all been previously recorded on the reserve. Currently, the reserve offers little suitable breeding habitat for these species, but all are known to breed in the vicinity. With a programme of habitat improvement works, Kilnhurst Ings has the scope to provide suitable breeding habitat for all these species with the possible exception of Kingfisher.

Bullfinch numbers declined steeply during 1977–82 especially in rural areas. The decline eased during the mid 1980s and has upturned since 2000. The species feed on insects, berries, seeds (e.g. dock, nettle, bramble, ash, birch), and buds, being particularly fond of buckthorn and alder buckthorn. An increase in dense, thorny scrub on the reserve would also benefit this species.

Linnet frequent woodland edge habitats and scrub habitats, utilizing mixed grassland as a feeding ground. This species is a seed eater, and is particularly dependent on the seeds of “weeds” such as thistle, common sorrel (*Rumex acetosa*) and docks and favouring dense, thorny scrub and hedgerows in which to breed.

Linnet numbers have declined substantially over the past few decades, with a 57% nationwide decline between 1970 and 2008. This decline is linked to agricultural intensification and, in particular, the conversion of traditionally-managed hay meadows to silage. An increase in dense, thorny scrub on the reserve would also benefit this species.

The UK yellowhammer population fell by 54% between 1970 and 1998, the main factor in this decline being low overwinter survival, probably because of decreasing availability of seed food sources on farmland. Yellowhammers nest on or close to the ground in ditch vegetation or at the base of short, thick hedgerows and scrub. Adults feed mainly on seeds throughout the year, and seek places where they can find lots of seed food. However, yellowhammer chicks depend largely on insects for food and adult birds also feed on insects in the breeding season. Superficially then, Kilnhurst Ings would appear to provide a good potential breeding habitat for yellowhammer, should the proportion of dense, thorny scrub on the reserve be increased.

The UK tree sparrow population has suffered a severe decline, estimated at 93 per cent between 1970 and 2008. They are not currently known on the reserve, although there is a population 3.5 miles away in the Dearne Valley. An increase in dense, thorny scrub on the reserve may, in time, allow this species to utilise the site.

Shoveler are dabbling ducks, which favour shallow eutrophic waters with dense vegetation nearby for breeding. For many years in Britain, shovelers have been contracting their breeding range and increasingly concentrating on a limited number of sites, especially nature reserves and others with nature conservation designations (BTO Second Atlas), and this pattern is repeated in the South Yorkshire area. Birds were recorded in the Kilnhurst culvert and displaying furtive behaviour indicative of nesting in 2011 and it is possible that this species has bred on site.

Unusually for a dabbling duck, breeding shovelers are territorial, the males defending a feeding territory for the pair. Consequently, the number of breeding shoveler pairs the reserve could support is limited to 1. Efforts should be made to provide suitable waterside vegetation to allow nesting, both in the culvert and on the adjacent river bank. An increase in bankside vegetation would also benefit kingfisher (perching spots) and mute swan.

### **Management Objectives**

3.0 Reserve supports a diverse bird community, with bullfinch, linnet, yellowhammer, tree sparrow, kingfisher, mute swan and shoveler present on the reserve by 2034.

3.1 5% of reserve covered by dense, thorny scrub by 2021.

3.2 50% of reserve's riverbank densely vegetated by 2034.

For management prescriptions see 4.0 Work Programme.

All works to be carried out in compliance with the directory of Operational Standards and Techniques given in Appendix III.

### 3.5 Feature 4. Brimstone population

#### Population of brimstone butterflies breeding on site.

##### Attributes

<u>Attribute</u>	<u>Performance Indicators</u>	<u>Monitoring</u>
Population brimstone butterflies	Adult butterflies recorded annually.	Casual records

##### Factors

<b>Factors</b>	<b>Rationale</b>	<b>Management Required (Yes/no/monitor)</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>
<b>Presence of larval food plant</b>	In order to breed on the reserve the larval food plants of alder buckthorn must be present	<b>Yes</b>	Buckthorn and alder buckthorn present on site	N/A
<b>Climate change</b>	This species' colonization of northern sites in the UK is partially dependent on the trend of increasing mean temperatures, especially the frequency of mild winters.	No	N/A	N/A

### **Evaluation of current condition**

Adult brimstone butterflies have been recorded on Kilnhurst Ings (*R. Miller, pers comms.*) This species is found throughout much of the southern half of England but is less numerous further north. . If climate change progresses as predicted in the UK, with a general warming of the average temperature, the further spread through northern areas of the country is likely.

Brimstone butterflies frequent areas of open woodland, hedgerows and scrubby land, favouring sites where their larval food plants occur. These species – buckthorn (*Rhamnus cathartica*) and alder buckthorn (*Frangula alnus*) are currently absent on the reserve, but alder buckthorn will be planted during the course of this management plan, allowing the reserve to support a breeding population of brimstone (buckthorn will not be planted due to unsuitable soil conditions).

### **Management Objectives**

- 4.0 Reserve supports a breeding population of brimstone by 2023.
- 3.1 5% of reserve covered by dense, thorny scrub by 2021.

For management prescriptions see 4.0 Work Programme.

All works to be carried out in compliance with the directory of Operational Standards and Techniques given in Appendix III.

## 3.6 Feature 5. Water vole.

### **Breeding population of water vole present on reserve by 2034.**

A population of water vole (*Arvicola terrestris*) was present on the Kilnhurst Ings and on a number of other sites along the Rother prior to the 2007 flood. However, the extent of flooding resulted on the destruction of many of these populations and the species has not been recorded on the reserve or on other adjacent sites since that time.

National surveys suggest that the water vole has been in decline since the beginning of the twentieth century due to habitat loss, degradation and fragmentation – a decline which accelerated sharply from the 1960s onwards, coinciding with the spread of feral American mink (*Mustela vison*). Today, evidence indicates that water vole have disappeared from 94% of their former sites nationwide and are now a species of high conservation concern in the UK.

Water voles live along the banks of rivers, streams, ditches, pools and lakes, and areas of marsh or reedbed habitats can also support populations. They ideally prefer watercourses that have in-channel vegetation and/or are fringed with lush vegetation such as reeds, grasses, rushes, sedges and other marginal species to provide food and cover but will survive in areas without these features.

This is a long-term management objective, to be achieved as part of a (currently aspirational) wider project to reintroduce water vole to sites along the Rivers Don and Rother. No work towards this objective is to be carried out during the course of this management plan, although works to increase the percentage of wet habitats on the site and limit disturbance will be of benefit to the recovery of this species in the long term.

### 3.7 Feature 6. Public access and information.

**Reserve is safe, well-maintained and accessible to the public, who are kept informed about its wildlife and management.**

#### Attributes

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
<b>Path network</b>	Entrance and exit points are well-maintained with gates in good working order. Bund is regularly mown.	Through routine patrols
<b>Cleanliness</b>	Reserve has low levels of litter and dog waste.	Through routine patrols
<b>Public information</b>	Contact information for SRWT displayed on site.	Through routine patrols

**Factors**

<b>Factors</b>	<b>Rationale</b>	<b>Management Required (Yes/no/monitor)</b>	<b>Technical Indicator of control</b>	<b>Monitoring</b>
<b>Dogs and dog walking services</b>	Increasing dog ownership in the general population could lead to increasing amounts negative encounters between different user groups and dog-related nuisance, such as fouling, on the reserve.	Yes	Dogs on reserve are kept under owner's control at all times.  Dog faeces and abandoned bags containing the same are rare on the reserve.	Through routine patrols  Monitoring of incident log

## Evaluation of current condition

Kilnhurst Ings is a quiet site, with limited recreational activity. The reserve is valued by local people for recreational pastimes such as fishing and dog walking. There are few issues with vandalism or littering. Dog fouling is not a major problem on site.

Access infrastructure on the reserve is limited but is in good condition and is suitable for a site of this size. There is little information or interpretation on site and which limits opportunities for the Trust to inform visitors, or engage with them. This will be rectified during the period covered by this management plan.

As outlined above, the reserve is home to a number of bird species whose numbers are declining both nationally and in the Sheffield area. Species such as skylark, who build their nests on the ground are particularly vulnerable to accidental disturbance by people and especially by dogs during the nesting season (March –end July) and repeated disturbance will make these birds abandon their eggs, even if the eggs themselves are not harmed (or even seen) by the interloper. Measures to combat this disturbance have been outlined above.

Kilnhurst Ings is grazed by cattle between April and October. The cattle help to manage the site by keeping the grass at an optimum sward level for wildflowers and preventing colonisation of the site by scrub species. The practice on Kilnhurst Ings will be to select docile, hardy breeds of cattle for grazing the reserve. SRWT will work with the grazier annually to manage each group of cattle following comprehensive risk assessments to minimise the risk of negative encounters. SRWT will monitor the interactions between the site users and the cattle and take any future action if and when it becomes necessary.

SRWT will include Kilnhurst Ings within its annual events programme, which delivers a broad range of environmental and heritage activities across all Trust nature reserves. All events will be promoted through posters on site, notices in local publications, on the SRWT website and through the Kingfisher magazine which goes to SRWT members.

**The Reserve User Forum system of meetings** that SRWT has runs very effectively on many of its other nature reserves **will be introduced at Kilnhurst Ings**. Under this system, the reserve will have a summer (on site) meeting each year. These meetings will be advertised on site, on the Trust's website and by mailing list, and are open to all. At the meetings all aspects of site management are discussed and people will have the chance to ask questions and put their ideas across. Minutes for these meetings will be available to interested members of the public.

SRWT actively encourages people to become involved with, and take action to protect, their local green spaces. Kilnhurst Ings already has a number of local people who visit regularly and have an interest in the site and efforts will be made to keep them informed with what is happening on site, and to engage them in its management and development

6.0 Reserve is safe, well-maintained and accessible to the public, who are kept informed about its wildlife and management.

For management prescriptions see 4.0 Work Programme.

All works to be carried out in compliance with the directory of Operational Standards and Techniques given in Appendix III.

## 4. Work Programme

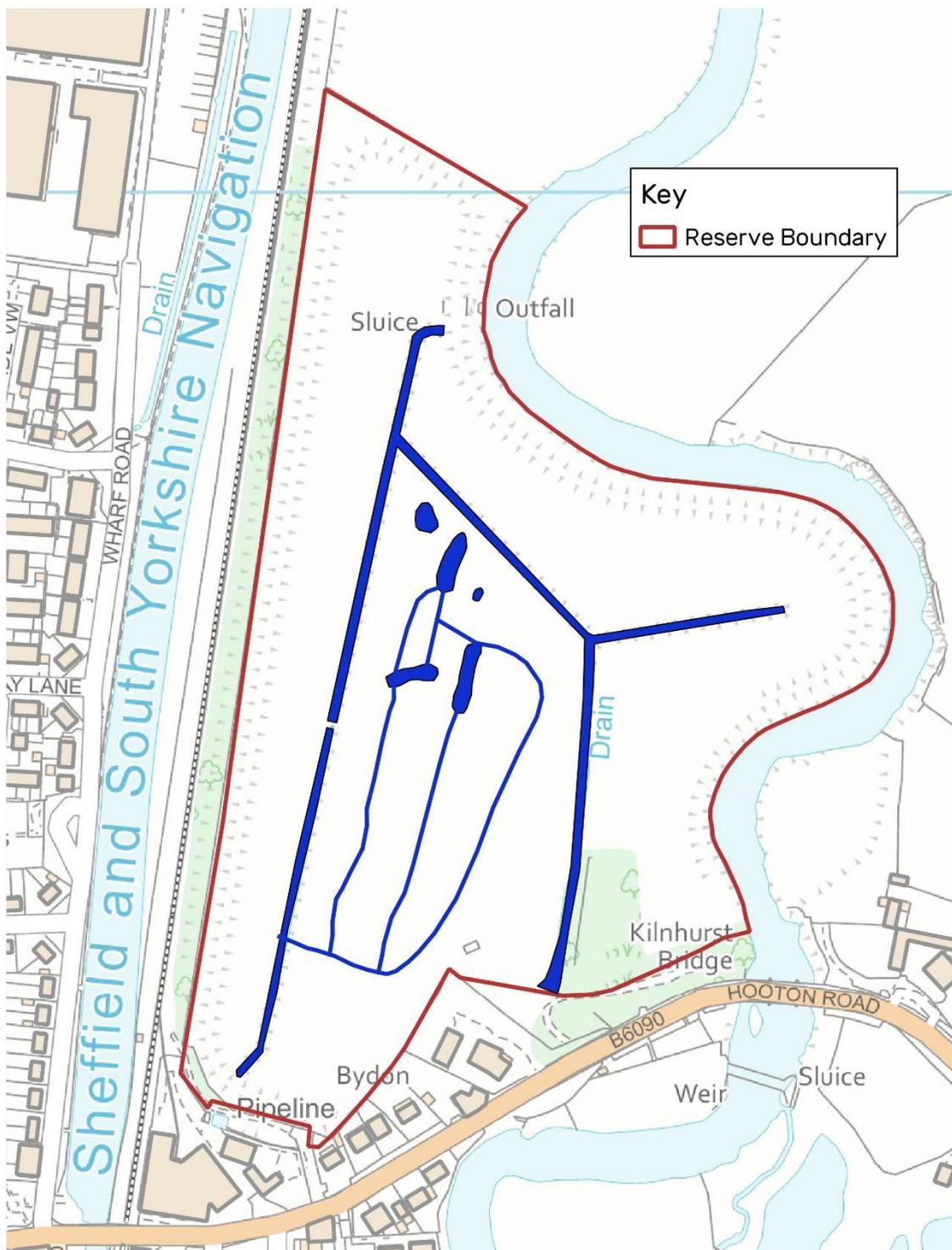
Feature	Objective no.	Objective with prescriptions	2019	2020	2021
<b>Breeding snipe</b>	<b>1</b>	<b>≥ pair of snipe breeding on the reserve annually, from 2020 onward.</b>			
		Graze central wetland area with cattle at 1.3 LU/ha from June-October annually. Adjust grazing period to ensure required sward heights are reached.	X	X	X
		Install knocking posts on all grazing enclosure gates	X		
		Close off central wetland area to cattle, people and dogs in April and May		X	X
<b>Open water habitat</b>	<b>2</b>	<b>Reserve supports 0.8 ha open water (ponds, scrapes and ditches) in good condition.</b>			
		Maintain sluices, culverts and drains to allow water flow across central wetland area	X	X	X
		Affix lower sluice to increase water back up along Collier Brook.	X		
<b>Bird community</b>	<b>3.1</b>	<b>5% of reserve covered by dense, thorny scrub on reserve by 2021</b>			
		Plant dense hawthorn/blackthorn/alder buckthorn hedge along reserve's western boundary (Figure 9).		X	
		Plant 6 wild cherry trees on the reserve		X	
	<b>3.2</b>	<b>50% of reserve's riverbank densely vegetated by 2034.</b>			
		Plant 20 scrub willow on riverbank in areas adjacent to existing trees.			X
<b>Breeding brimstone</b>	<b>4</b>	<b>Population of brimstone butterflies breeding on site.</b>			
		<i>Cross ref w 3.1 above</i>			
<b>Water vole</b>	<b>5</b>	<b>Population of water vole on site</b>			
		No action to support this feature planned for this management planning period.			
<b>Public Access</b>	<b>5.3</b>	<b>Reserve is safe, well-maintained and accessible to the public, who are kept informed about its wildlife and management.</b>			
		3x SRWT signage installed on reserve	X		
		Annual reserve user forum meeting to be held on the reserve	X		
		Existing interpretation panel to be refreshed			X

# 5. Figures



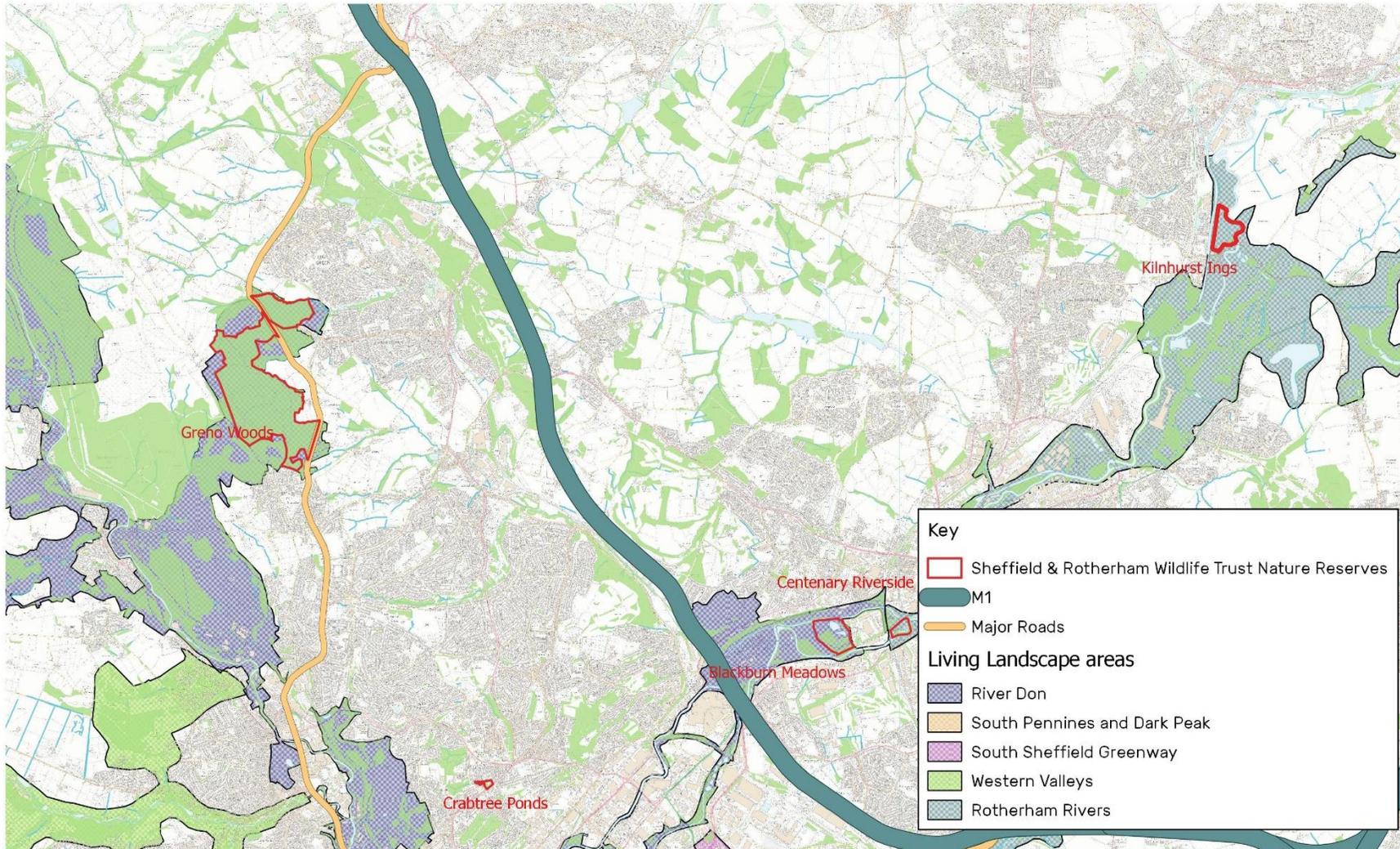
## Kilnhurst Ings

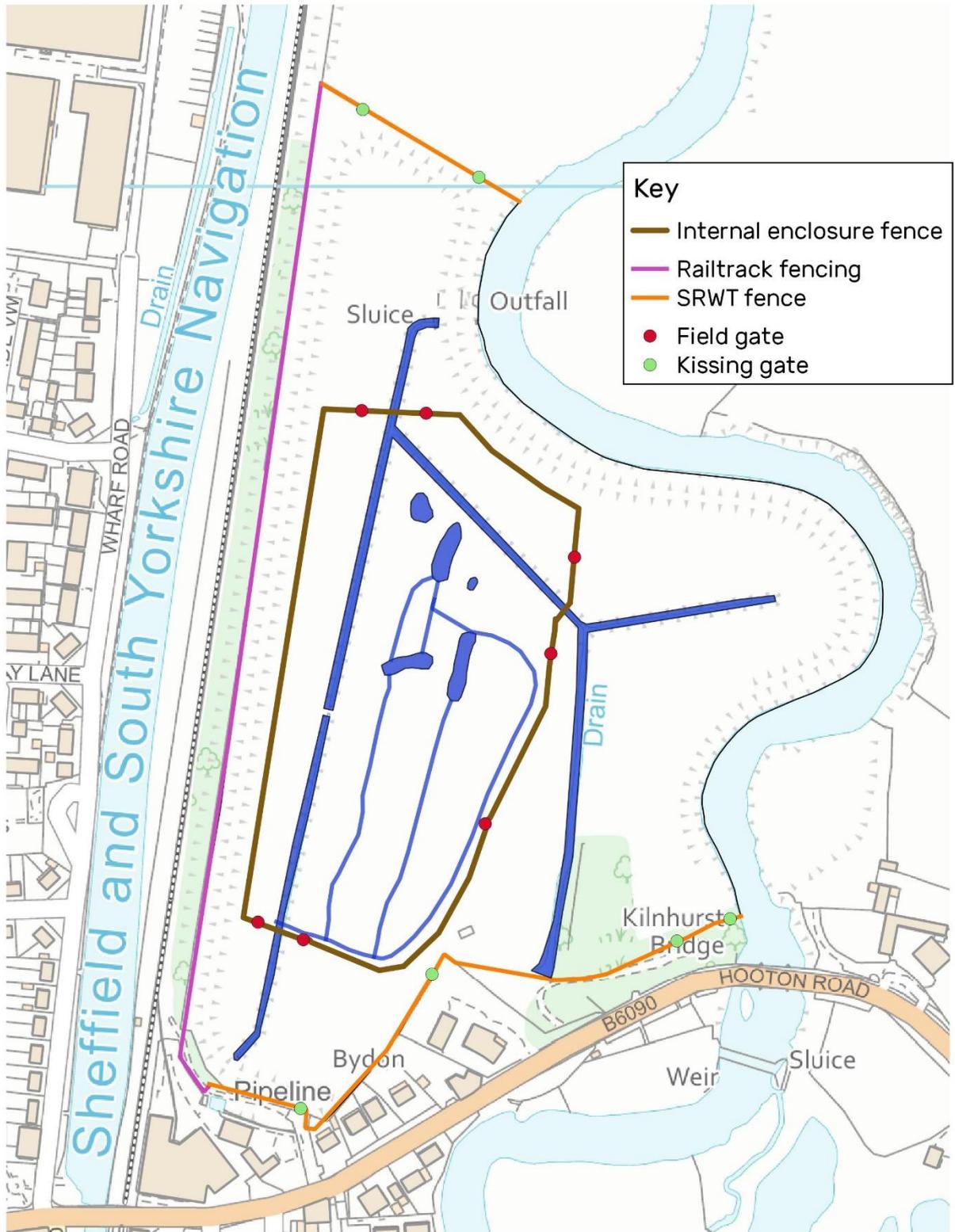
### Figure 1: Location and Extent



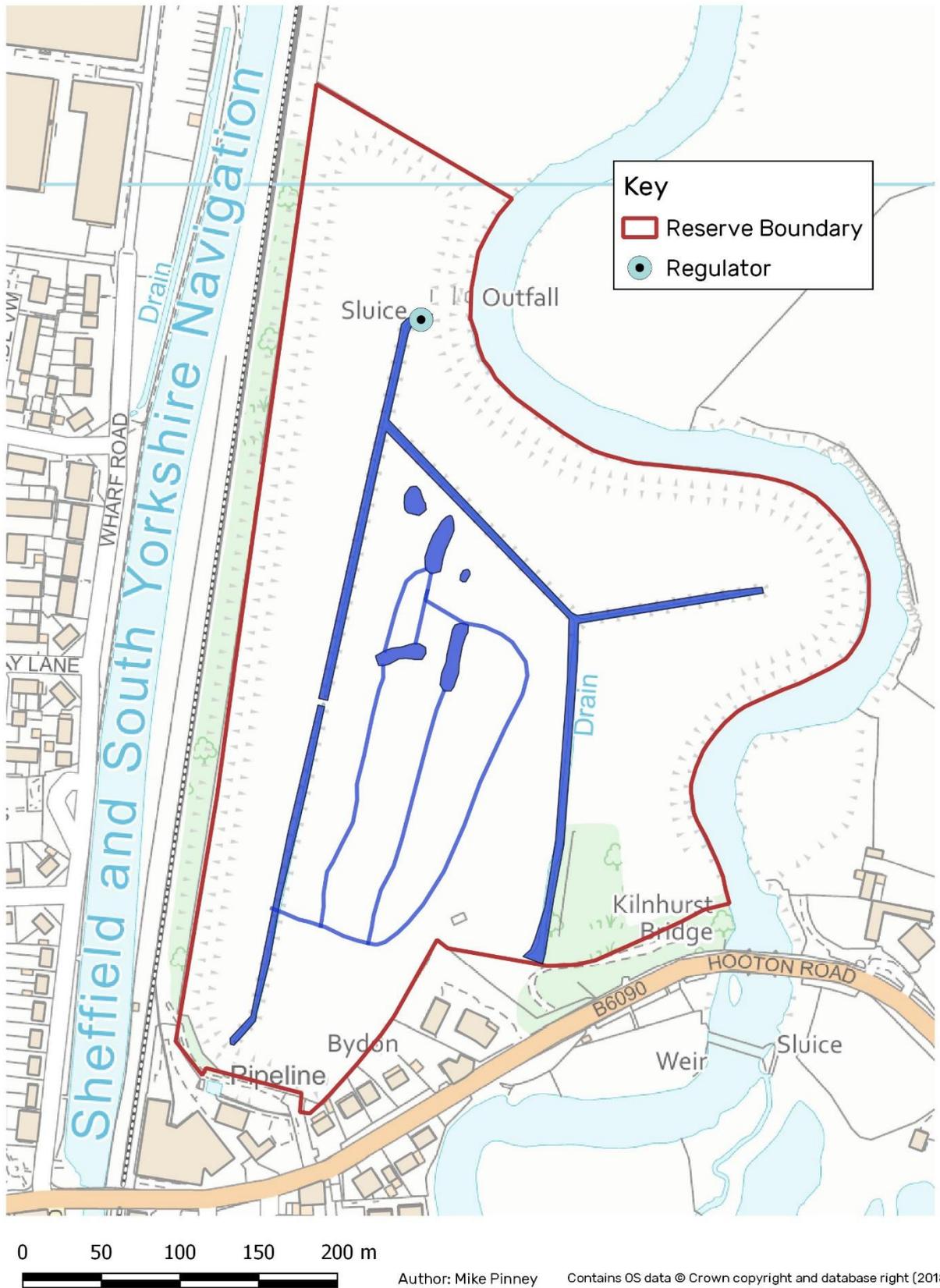
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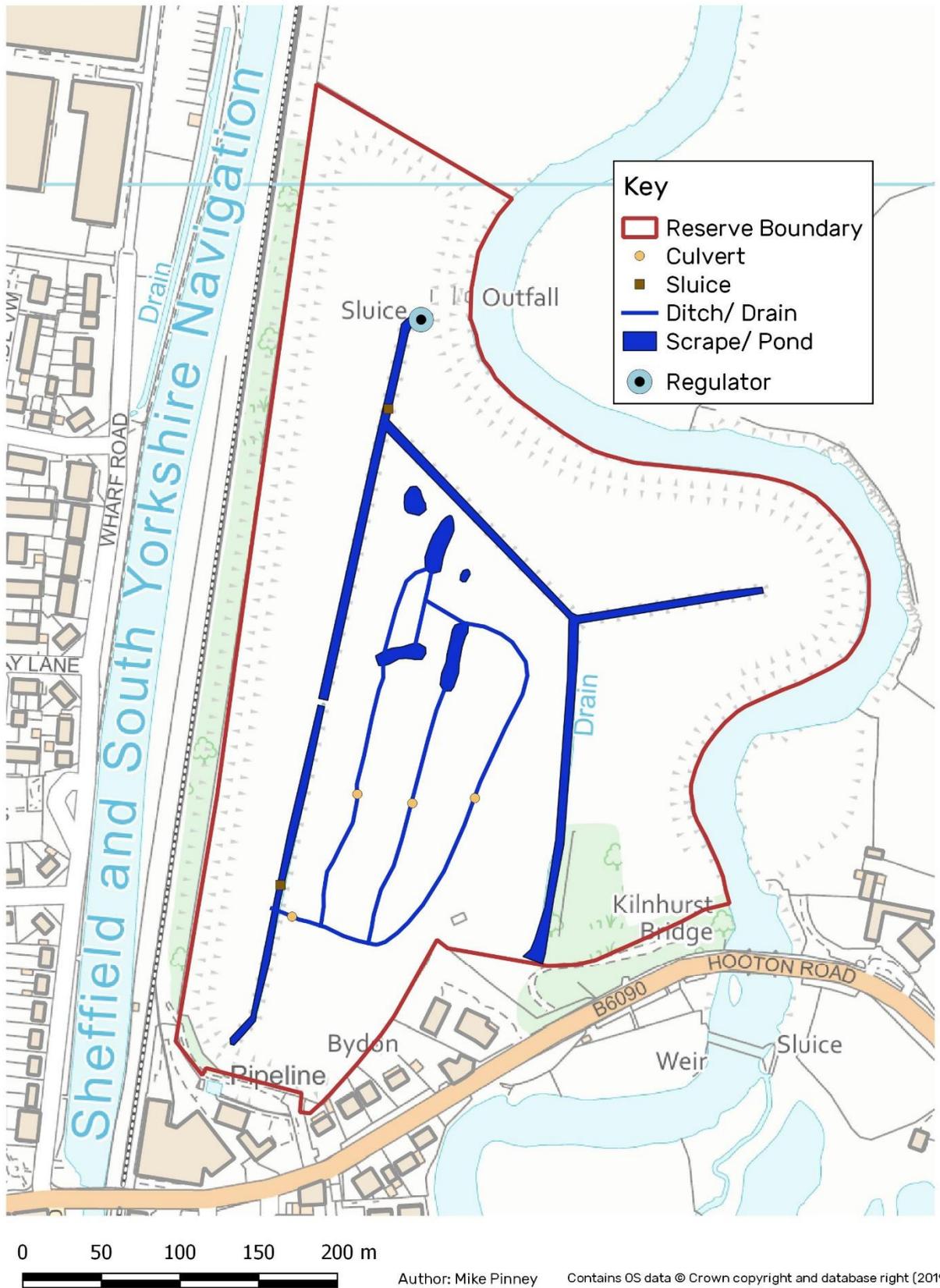
Author: Mike Pinney Contains OS data © Crown copyright and database right (2018)



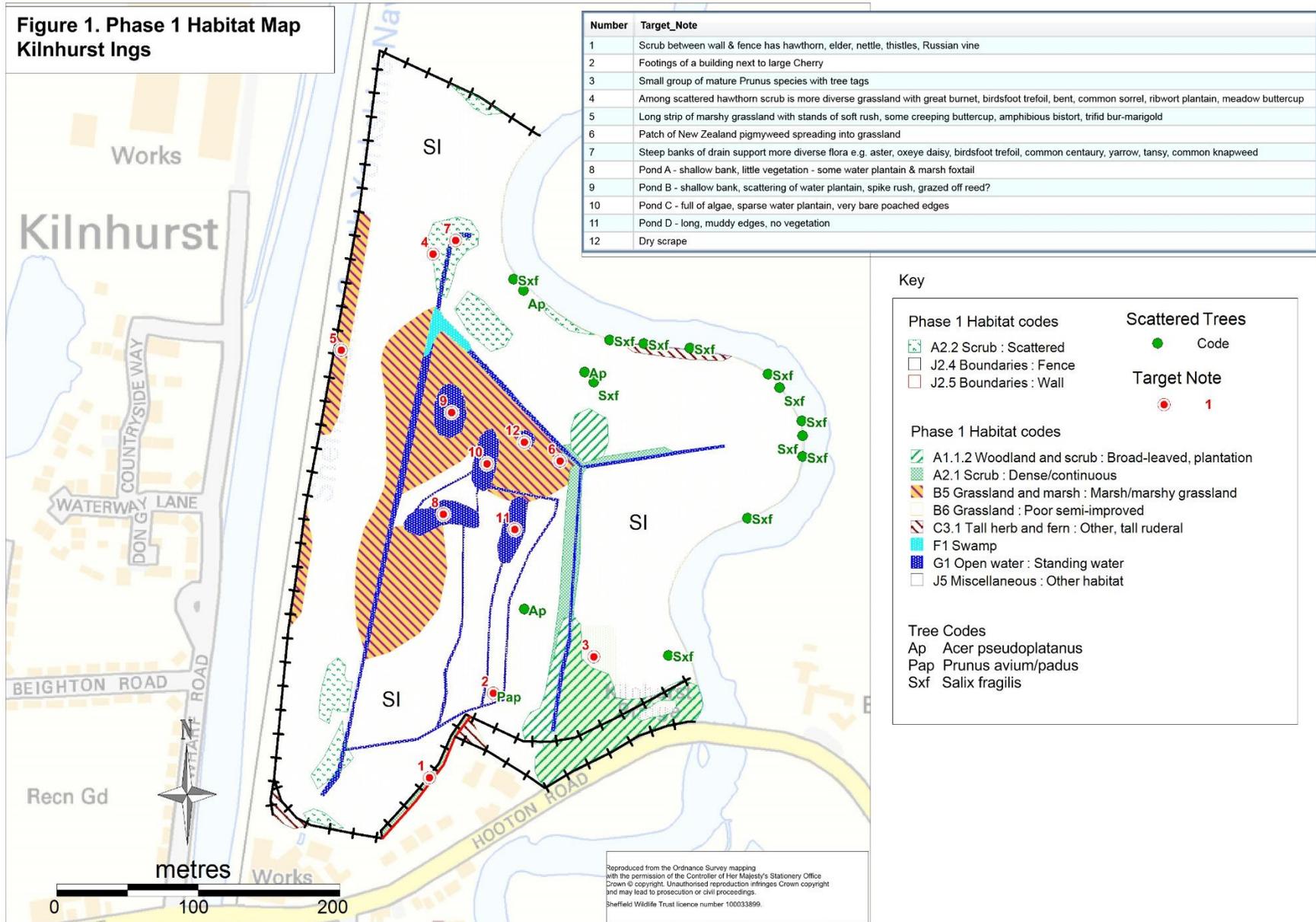


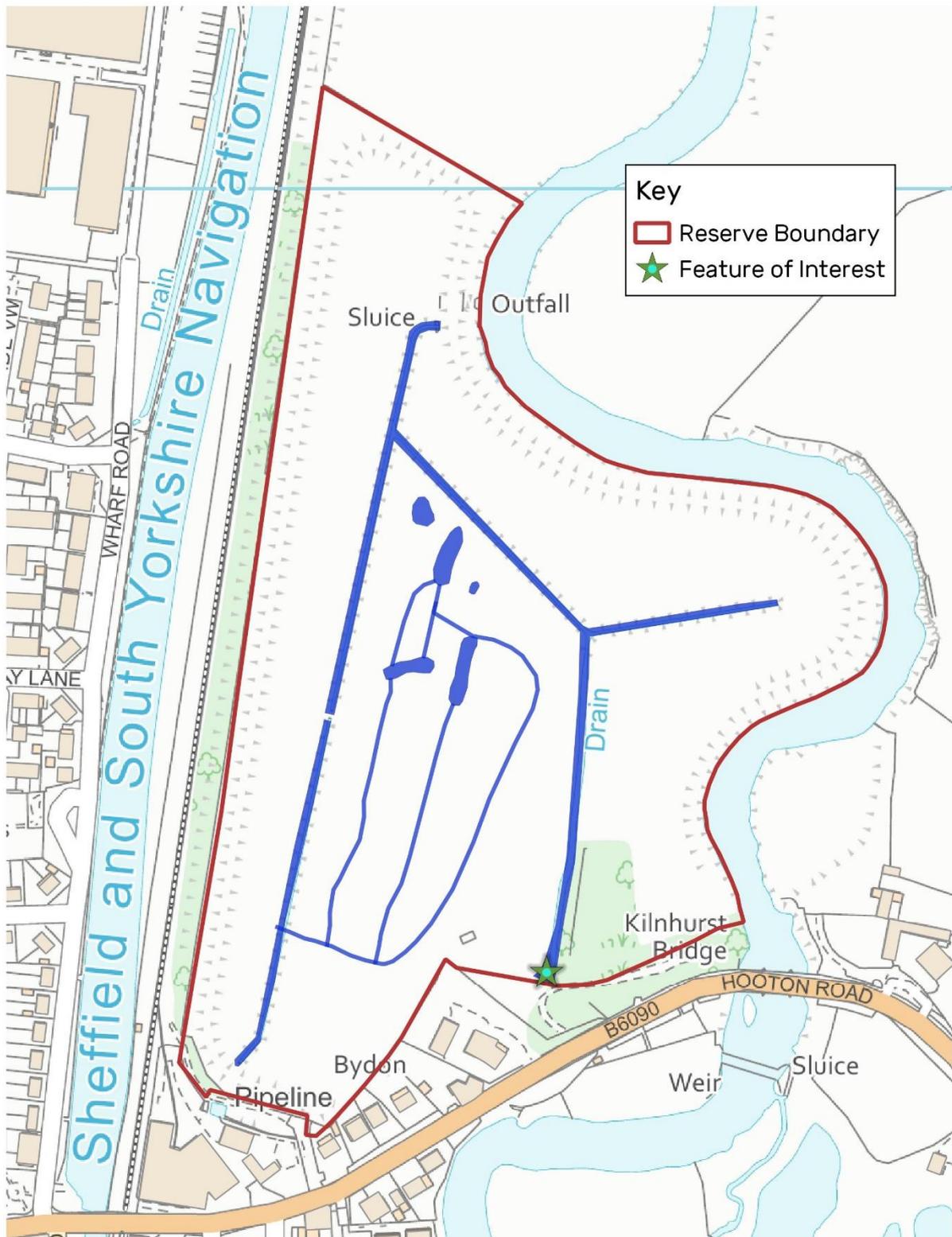
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**Figure 1. Phase 1 Habitat Map  
Kilnhurst Ings**



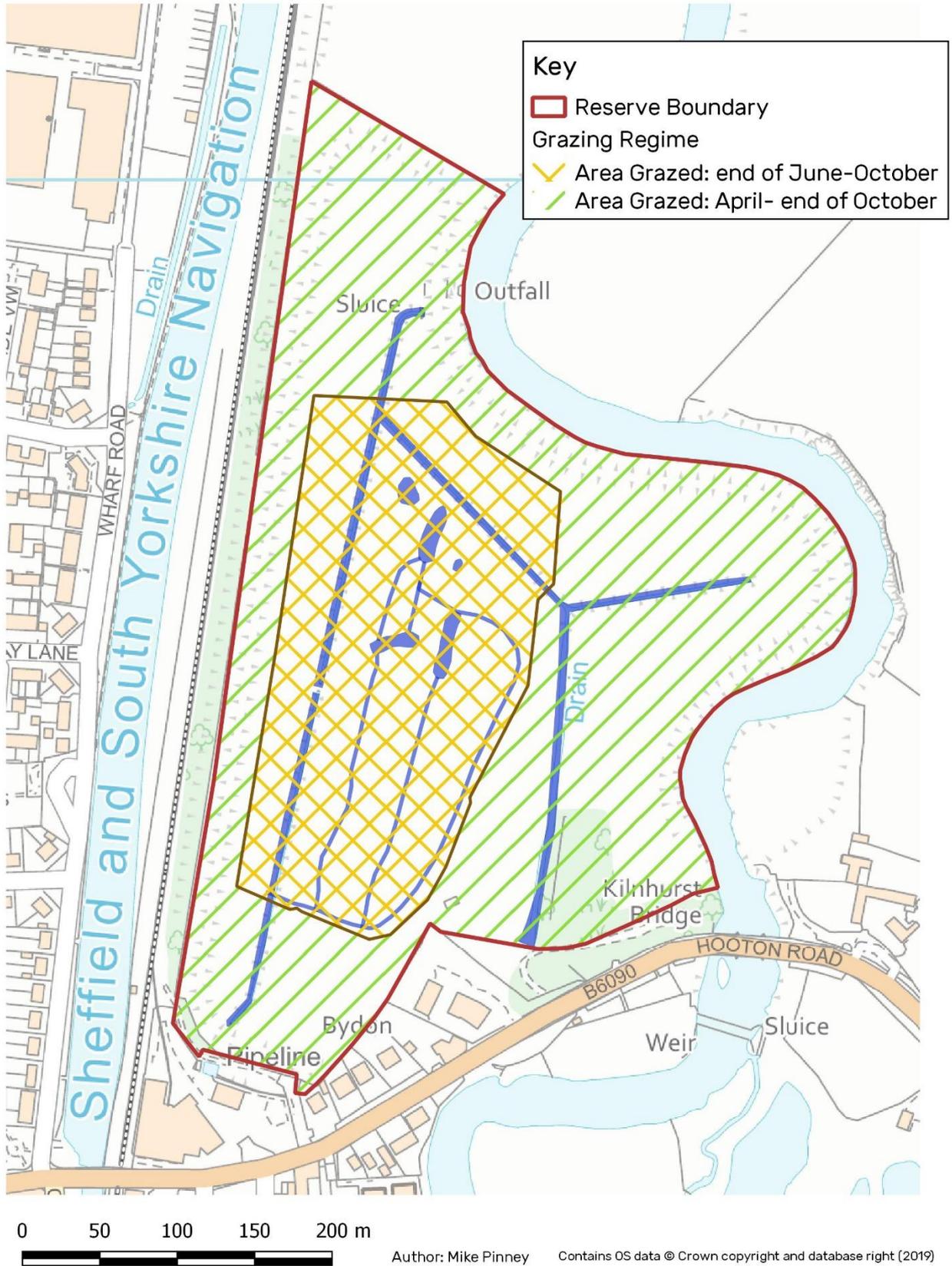


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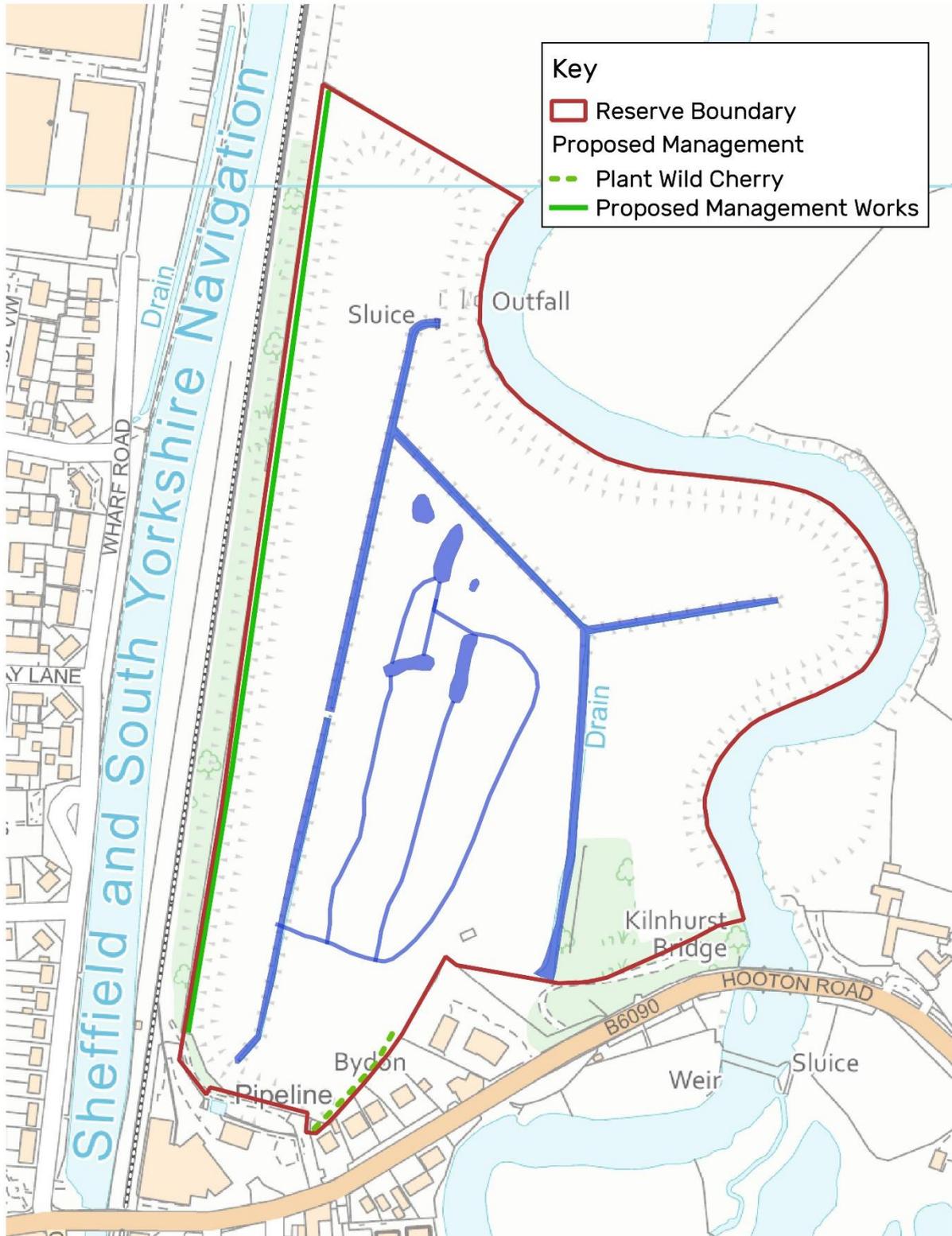


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## APPENDIX I: Glossary of Acronyms and terms

BAP	Biodiversity Action Plan
CS	Countryside Stewardship
EA	Environment Agency
LNR	Local Nature Reserve
PRoW	Public Right of Way
RMBC	Rotherham Metropolitan Borough Council
SRWT	Sheffield and Rotherham Wildlife Trust
TPT	Trans Pennine Trail

## APPENDIX II                      SUMMARY                      OF                      PROPOSED MONITORING

FEATURE	Monitoring Methodology	Frequency
1.     Breeding snipe	Territory mapping Vegetation monitoring	Every 3 years Every 3 years
2.     Open water habitat	Remote sensing Dragonfly monitoring	Every 3 years Every 3 years?
3.     Bird community	Remote sensing Casual records	Every 3 years Annually
4.     Brimstone butterfly	Casual observation	Annually
5.     Water vole	N/A	N/A

# APPENDIX III: Operational Standards and Techniques

## Management of grazing

Monitoring of the nitrate input to the reserve is carried out under the reserve's Countryside Stewardship (CS) agreement.

Care will be taken to ensure that the cattle-grazing season is strictly adhered to, with **cattle removed from site promptly at the end of October**, or earlier if feed becomes sparse or conditions are particularly wet.

Any management that decreases the net amount of water held on site, overgrazing and the use of pesticides (including vermicides) will be avoided.

Docile, hardy or semi-hardy cattle will be selected to graze the site and their behaviour monitored. No supplementary feeding will be allowed.

The condition of boundary fences and walls will be inspected regularly. Where fence repair is required, negotiation will begin with the neighbouring landowner, to contribute either partially or fully towards the cost of fence repair to ensure inclusion of stock, if applicable. There have been no incidents of stock escapes during the last five years.

## Biosecurity

Procedures and measures designed to protect the environment against harmful biological agents and invasive species e.g. *Crassula helmsii* are laid out in the Trust's Biosecurity procedure, which will be adhered to during the delivery of this management plan.

## Archaeology

The tail goit (**Figure 7**) and will be protected during any works on the reserve.

## Protected species

All management operations (with the exception of mowing) will be carried out between end August and end January to avoid disturbance to breeding birds.

## Veteran and Notable Trees

All mature willow trees on site will be retained.

## Water Management

The natural and man-made watercourses/features can be seen in Figure 5. Planning for operations in the vicinity of water features is in accordance with the EA guidance PPG5: prevent pollution.

The Environment Agency are to be alerted to any possible contamination of watercourses.

There are no plans to use fertilizers or herbicides on the reserve.

## Use of pesticides and fertilisers

Pesticide use on the reserve will be kept to a minimum, in accordance with SRWT policies and procedures, which undertakes to reduce the use of all synthetic chemicals where possible either by use of less harmful products or where appropriate, the use of an integrated pest management system.

Fertiliser will not be used at Kilnhurst.

If pesticides are used, COSHH assessments and completed pesticide reports will be held on file by SRWT.

## Waste disposal and pollution

No significant waste from management operations has been identified (see above re: nitrates).

The Environment Agency and SCC Environmental Enforcement Officer will be informed of all illegal activities as appropriate.

Fly-tipped waste will be removed and deposited by a licensed waste carrier. The reserve will be litter-picked on a regular basis.

Fuel and chemical containers will be removed from the site by operators and disposed of through a licensed tip or a specialist waste disposal contractor.

Surplus fuels and chemicals will be returned to the SRWT store before safe disposal in line with environmental requirements.

Procedures and equipment will be in place during operations for control of any oil or chemical spill on the reserve, see section Emergency Procedures below.

## Emergency procedures

### **Chemical and oil spill**

A chemical and oil spill emergency plan will be in place for all operations. Where work is being carried out by a third party, they will be required to have a robust procedure in place.

### **Accident plan**

All operations will have a risk assessment providing emergency procedure details in case of accident or injury, including nearest A & E hospital, main access grid reference and details of mobile telephone signal. Other work operations will include emergency details on the risk assessment for the work.

The SRWT telephone number is clearly indicated on site signage to allow members of the public to make contact in case of accident and emergency.

## Flood bank maintenance

Responsibility for the maintenance of the flood banks lies with the environment agency. SRWT will ensure their management operations do not damage or impede access to these banks in any way.

The reserve's woodlands will be surveyed and managed in line with the Trust's Tree Risk Management Procedure.

## Public Access and information

SRWT signage will be installed and maintained at reserve entrances.

Information about the reserve, and its management will be provided on site, and on the Trust's website [www.wildsheffield.com](http://www.wildsheffield.com)