



Sheffield & Rotherham

Reserve Management Plan

Wyming Brook

April 2019-March 2027

Wyming Brook by Sarah Sidgwick

Acknowledgements

Sheffield and Rotherham Wildlife Trust would like to thank the many individuals who have contributed to the formulation of this management plan.

Please note that information concerning sensitive species has been redacted from this plan.

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1.0 INTRODUCTION

Sheffield and Rotherham Wildlife Trust (SRWT) 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. The Trust aims to promote conservation, advance education in environmental matters and improve the quality of life in Sheffield and Rotherham, through the protection of biodiversity, and the development and promotion of sustainable land management practices.

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 local organisations. In order to fulfil this vision, we:

- i) Work to create and manage a more resilient network of natural spaces, to support a greater diversity and abundance of wildlife and habitats across Sheffield and Rotherham;
- ii) Help local people to visit, understand, enjoy, value and be inspired by nature;
- iii) Support local people and organisations take action for nature and wildlife.

1.1 Purposes and formulation of the plan

This management plan has been formulated for the following reasons:

- To provide comprehensive and cohesive information about the nature reserve in one document, with reference to other documents where necessary;
- To outline the long-term vision for the reserve and the associated objectives which form the framework of management;
- To outline the rationale for management, giving a clear and comprehensive explanation of why features require management, the form that this management will take and how this will be monitored;
- 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 objectives, prescriptions and monitoring 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.

1.2 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.

Please note that information concerning sensitive species has been redacted from this plan.

2.0 SITE DESCRIPTION

2.1 General Information

Location and Extent

Wyming Brook nature reserve is centred on O.S. Grid Reference SK 265 870 and covers an area of 69.8 ha (**Figure 1**). It forms part of the Western valleys landscape area (**Figure 2**).

Landscape value and context

Wyming Brook nature reserve falls within Natural England's Natural Character Assessment Profile 37: Yorkshire Southern Pennine Fringe, as a transitional area lying between the upland Pennine block to the west and the lower-lying arable land to the east.

The reserve's landscape is typified by steep slopes, deep-cut valleys with rushing streams and mature, mixed woodlands. Boulders and crags (both natural exposures and the result of past quarrying) form an important component of the landscape. The site's man-made features, particularly its winding paths and dry-stone walls, are generally in keeping with both the 'feel' of the site, and the surrounding countryside.

Viewed from the valley, Wyming Brook nature reserve appears as a woodland block reaching the skyline. From above, the reserve's mature woodlands provide a dramatic border to the moorland edge. The texture and colour of the woodland provide an attractive scene when viewed from the A57, one of the main routes into Sheffield. However, the predominance of natural regeneration, which follows the contour of the slope, has softened and naturalised the effect, and the reserve avoids the harsh lines typical of a conifer plantation. Similarly, although some of the woodlands are non-native in character, the age structure, variability and diversity of planting complement, rather than dominate, other landscape components. The gradient of the site's slopes also help to break up what would otherwise be a very dense canopy and the site provides excellent views of the surrounding countryside from its western fringe. The majestic conifers provide an important landscape feature which is unique in the Sheffield area.

Site tenure and occupancy

The site's freehold is owned by Sheffield City Council. From April 2002, Sheffield and Rotherham Wildlife Trust took on the leasehold for the site for a period of 30 years.

Fox Holes Plantation is owned by the Sheffield Town Trust and was previously under a 99-year lease to Sheffield City Council, which ceased in 2003. SRWT obtained a lease from the Sheffield Town Trust in 2012 and therefore the plantation is now incorporated into Wyming Brook nature reserve.

Designations and Policy Context

The southwest section of Wyming Brook nature reserve forms the boundary to the South Pennines **Special Protection Area** (European Birds Directive 79/490/EEC; **Figure 3**). This designation has been made in recognition of the importance of the South Pennines' upland breeding bird assemblage. In particular, this designation has been made to safeguard breeding populations of Merlin (*Falco columbarius*), golden plover (*Pluvialis apricaria*) and short-eared owl (*Asio flammeus*), none of which nest on the reserve.

This section of the reserve also forms part of the Southern Pennines candidate **Special Area of Conservation** (European Habitats Directive 92/43/EEC; **Figure 3**). This designation has been made in recognition of the existence of a number of habitats of European importance, which comprise blanket bog, European dry heath, North Atlantic wet heaths with *Erica tetralix*, upland oak wood and transition mire and quaking bogs.

This area of Wyming Brook nature reserve is also designated as a **Site of Special Scientific Interest (SSSI)** notified under section 28 of the Wildlife and Countryside Act, 1981 (amended), and given further protection under the Countryside and Rights of Way Act, 2000 (**Figure 3**). This designation was given as part of the elevation of the whole Eastern Moors to SSSI status, a designation made in recognition of the area's breeding bird assemblage, upland vegetation, lower plants, invertebrates and geological features. Under the SSSI designation Wyming Brook nature reserve is Unit 45 in the unit system and is named "New Hagg Woods" under this system. The reserve was assessed in February 2002 and found to be in favourable condition.

Wyming Brook nature reserve falls within the Peak District National Park; National Park status means that the priority to be placed on landscape conservation should be greater than for most other areas of England.

The **Environment Act** (1995) defined the purpose of National Parks as being to:

- Conserve and enhance natural beauty, wildlife and cultural heritage;
- Promote opportunities for the understanding and enjoyment of the special qualities (of the Parks) by the public.

The Act further places a duty on all 'relevant bodies' to have regard to National Park purposes in considering and carrying out their duties.

Under the **Peak District National Park's Structure and Local Plans** the central part of the reserve is designated as *Recreation Zone 2* (informal recreation uses acceptable with careful management, such as small car parks, picnic sites, facilities linked to walking, cycling and riding), whilst the remainder is classified as a *Natural Zone* (land which is particularly important for the conservation of wildlife, and whose natural and remote character should be retained).

A section of the site to the north of Rivelin Brook has been designated as **Plantation on Ancient Woodland Site (PAWS; Figure 4)**. This means that the area has been wooded since at least 1600AD, but at some point in the past the native trees were removed and planting of non-native species has taken place.

Sheffield's **Green and Open Space Strategy** (2010 – 2030) sets out the councils approach to managing for nature and biodiversity and making green connections for people and wildlife. Under this document the council sets out the following policies applicable to Wyming Brook:

ENV W1 Protect and enhance priority wildlife species and habitats within designated Local Nature Sites and Sites of Special Scientific Interest (SSSI).

ENV W2 Manage all public spaces, where appropriate, to protect and enhance their potential value for wildlife and habitats.

ENV W3 Develop the wildlife potential of other non-public spaces, where appropriate, to support the sustainability of the wider green space network.

ENV W4 Promote awareness and understanding of the nature conservation value of green spaces as a core part of managing those sites for wildlife and biodiversity.

ENV G1 Manage a network of links between local green spaces and the regional green infrastructure network, for the benefit of both people and wildlife.

ENV G2 Seek opportunities for enhancing the quality, functionality and continuity of the green network both for public use and for biodiversity.

Additionally, Wyming Brook nature reserve holds a **Green Flag award** which recognises the quality of green spaces. The Green Flag award is a benchmark national standard for parks and green spaces and is assessed on eight criteria.

- A **welcoming** place which provides good and safe access for all members of the community
- A **healthy, safe and secure** site with the appropriate and safe infrastructure, facilities, signage and policies.

- A **clean and well maintained** site with litter disposal facilities and policies for litter and vandalism.
- A **sustainable** site with an environmental policy and management strategy in place. The management of the site should minimise pesticide use, recycle waste plant material and have energy conservation, pollution reduction and waste recycling measures.
- Particular attention should be paid to the **conservation and heritage of natural features**, wildlife and fauna, landscapes, buildings and structural features.
- The site should actively pursue **community involvement** and demonstrate knowledge of levels and patterns of use and provide appropriate recreational facilities for all.
- A marketing strategy should be in place and there should be good provision of information to users.
- The management of the site should reflect the aspirations of Local Agenda 21 and should address all the above criteria. The management plan should be reviewed regularly and financial consideration should be addressed.

Public Rights of Way

Wyming Brook nature reserve has a **Public Rights of Way** network, including both footpaths and bridleways (**Figure 5**). Wyming Brook Drive is a designated by-way, but is now no longer open to all traffic and functions as a bridleway.

Reserve Management

The reserve is managed by the Trust's Living Landscapes Manager (north), with support from a Community Wildlife Ranger and the Trust's Land Management Team. At the time of writing the manager for Wyming Brook is Mr Rob Miller nature.reserves@wildsheffield.com.

Health and Safety

Sheffield and Rotherham Wildlife Trust has many detailed policies including a Environmental Policy & Health and Safety Policy, which are amended and updated at regular intervals or when key legislation changes.

The reserve is regularly patrolled by staff and volunteers from Sheffield and Rotherham Wildlife Trust and any issues on site are logged to be dealt with as soon as possible. Any known accidents or incidents are recorded on the relevant accident forms. A risk assessment for the site has been produced and is updated annually. Regular tree safety inspections and associated remedial work are carried out.

There are no litter bins or dog waste bins on site locate and visitors are encouraged to take all litter home with them for disposal.

Fly tipping is an occasional problem in the Redmires Road car park and is dealt with as necessary.

Regular litter picks of the reserve are carried out.

A number of our Reserve Advisory Group (RAG) members visit the site on a daily basis and will report any vandalism, fly tipping, Graffiti etc promptly.

Adjacent land ownership

Yorkshire Water, who also manages Redmires and Rivelin Reservoirs, own the woodlands to the north and east of Wyming Brook nature reserve, adjacent to Rivelin Reservoirs. The moorland to the west of the site (Hallam Moors) form part of the Moscar Estate and are tenanted by a local farmer. The moor is managed as grouse moor and is also lightly grazed by sheep. The land adjacent to Redmires Road car park and Ash

Cabin Flats is also privately owned by a local farmer. There is a stock-proofing between the moor and the nature reserve, although this does not follow the reserve boundary in places.

The owners of the land adjacent to the north-western tip of Wyming Brook nature reserve are not known at present.

A section of woodland to the east of Fox Holes plantation is part of the property of Fox Holes Lodge.

Site History and Past Management

It is believed that there was very little medieval settlement or exploitation in or around the area of the reserve, and wood pasture or wooded common is likely to have been the dominant land use until the early 19th century, at which time partial enclosure of the adjacent moorland occurred (EDAS 2001). Prior to this period, much of the tree cover on the reserve must have been cleared, as the earliest OS map (1840) shows Fox Holes Plantation as the only existing woodland. However, the woodland cover must have been regenerating over much of the remainder of Wyming Brook nature reserve at that time, since the 1846 tithe maps indicate a cover of woodland for much of the site, excluding the Rivelin Brook area. By 1905 the latter area had also developed woodland.

The existing woodlands include both broadleaved and coniferous plantations, and also naturally regenerating oak-birch woodland. Much of the conifer woodland was planted by the Sheffield Water Company (and later the Sheffield Corporation) to prevent soil erosion around the Rivelin Reservoirs, and later experimental plantings were made by the Forestry Commission to assess the growth rates of different conifer species (P. Ardron pers. comm.). During the 20th century the reserve was predominantly used for recreational or sporting purposes, either in the form of private grouse shooting on the moorland, or as public access via Wyming Brook Drive.

Services and Vehicular Access Points

The only utilities services present on site at Wyming Brook nature reserve are water mains pipes, which cross the car park and area of scrub at the southern entrance to the reserve (**Figure 6**).

Yorkshire Water has the right to take water from Redmires and Rivelin reservoirs, given under an abstraction licence (Water Resources Act 1995), which is granted by the Environment Agency. Wyming Brook is being used to transfer water between the two reservoirs. This transfer is being run under an agreement between Yorkshire Water, the Environment Agency and Sheffield City Council, and specifies maximum and minimum transfer rates between the reservoirs using the stream.

Vehicular access across the reserve is possible only via Wyming Brook. The drive can be accessed from Redmires Road, via the car park, or from two points on/adjacent to the A57 (**Figure 6**).

2.2 Environmental Information

Topography

Wyoming Brook nature reserve lies on a steep, rocky hillside in the Rivelin Valley, to the south of the A57. The reserve has a generally north-facing aspect, with an altitude between 175m and 285m.

Geology

The reserve lies on bedrock of the Carboniferous Millstone Grit series which is comprised of gritstone/sandstone, mudstone and conglomerates, interspersed by impermeable shales.

A resistant layer of coarse Rivelin Grit forms the major escarpment edge along the southern boundary of the woodland and is replicated on the opposite side of the valley at the north in Cpt 589. The strata dips gently to the south and large blocks have been broken off where spring lines below this strata emerge onto impermeable shale and wear it away. Blocks of grit occur down much of the lower slope throughout the woodland, perhaps aided by solifluction (boulder movement over permafrost) during periglacial times. This process is most evident along the crag in Cpt 590m.

A large wet flush area is present in Cpts 590cd within shales below the grit formation. Nearby geological fault lines may have made this area even more susceptible to the accumulation of water. Smaller pockets of flush are present throughout the woodland (as indicated by wet woodland in Fig 13).

Alluvial deposits occur within along stream in Cpt 589.

Pedology

Thin acid podzolic soils occur directly upon the Rivelin Grit outcrop, resulting in Heath and developing NVC W16 Oak/Birch communities. Such W16 ground flora communities (Bilberry & Wavy Hair Grass) are still present upon the large grit boulders throughout the remainder of the woodland.

The wetter shale below the Rivelin Grit has produced a deeper, more basic brown earth soil, giving rise to NVC W10e community of Oak/Bramble/Bracken.

Alder W6&7 communities are found in the alluvial deposits at the north of the woodland in Cpt 589.

Climate

Table 1 provides climate data for the thirty-year average (1970 - 2000), taken from the local Sheffield weather station at Weston Park. The prevailing wind is from the west.

Table 1. Thirty-year average climate data for Sheffield.

Location	Mean Annual Rainfall (mm)	Sunshine (hrs)	Mean maximum temperature (°C)	
			Daytime	Night
Sheffield (131m)	825	1380	13.1	6.4

It is recognized that 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. However, given the current uncertainty on the quantitative effect of climate change on the UK's climate (other than an acceptance that climatic extremes will become more frequent) and the difficulty in distinguishing the effect of climate change from other factors – changes in land use, changes in farming practice, disease etc – that affect

species, no recommendations to manage specific species or assemblages in response to climate change are made *at this time*. Instead, measures to make the reserve more resistant to climate change will be adopted.

Hydrology

Wyming Brook nature reserve is generally freely draining, but in places impermeable shales have impeded drainage, causing the formation of wet flushes. Elsewhere on the reserve, faults have led to the development of boulder-filled gullies, usually carrying running water. Two major streams are present on the site: Wyming Brook, which runs through the centre of the site and carries water from Redmires Reservoir to the Rivelin Dams; and Rivelin Brook, which enters the site at its north-western point and runs eastwards across the site to its confluence with the Rivelin Dams (**Figure 7**).

Yorkshire Water has formed an agreement with the Environment Agency to transfer water between the two reservoirs using the Wyming Brook. The flow rates are regulated and seasonally adjusted, and usually vary between 5 and 10Ml/d over the course of the year but are currently set at 2Ml/d due to drought conditions.

2.3 Biodiversity

Notable Habitats and Species

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

Table 2: BAP Priority habitats and species

UK Priority Species	
Habitats	Section 41 species, Natural Environment and Rural Communities (NERC) Act.
Rivers	Bullfinch (<i>Pyrrhula pyrrhula</i>)
Upland oak wood	Cuckoo (<i>Cuculus canorus</i>)
Upland heathland	Dunnock (<i>Prunella modularis</i>)
	Linnet (<i>Carduelis cannabina</i>)
	Nightjar (<i>Caprimulgus europaeus</i>)
	Song thrush (<i>Turdus philomelos</i>)
	Spotted flycatcher (<i>Muscicapa striata</i>)
	Red grouse (<i>Lagopus lagopus scotica</i>)
	Tree pipit (<i>Anthus trivialis</i>)
	Wood warbler (<i>Phylloscopus sibilatrix</i>)

Peak District National Park BAP Priorities	
Habitats	
Moorland fringe Woodland Rivers and streams	Bats (all species) Dipper (<i>Cinclus cinclus</i>) Yellow wagtail (<i>Motacilla flava</i>) Water vole (<i>Arvicola amphibius</i>)-present in the vicinity Woodland birds (lesser redpoll, nightjar, spotted flycatcher, tree pipit, willow tit, wood warbler) Brown trout (<i>Salmo trutta</i>)
Sheffield BAP Priorities	
Habitats	
Woodland Heathland	Bluebell (<i>Hyacinthoides non-scripta</i>) Bats (all species) Nightjar (<i>Caprimulgus europaeus</i>) Woodland birds (spotted flycatcher, lesser redpoll, woodcock, willow tit) Water vole (<i>Arvicola amphibius</i>)-present in the vicinity

In addition, a number of species are found within the reserves that receive special protection under the Wildlife and Countryside Act 1981.

Two Sheffield Red Data Book invertebrate species and one bird species have been found at Wyming Brook nature reserve (see Table 3).

Table 3. Red Data Book species.

Birds	Bullfinch (<i>Pyrrhula pyrrhula</i>)
Invertebrates	Hoverfly (<i>Xanthandrus comtus</i>) Hoverfly (<i>Xylota coeruleiventris</i>)

Habitats

Wyming Brook nature reserve is dominated by mature, semi-natural mixed woodland, with areas of heathland and bracken on its western boundary. Some areas of plantation woodland, both deciduous and coniferous are also present, whilst areas of semi-natural deciduous woodland are found across the reserve. These are dominated by oak and birch in drier areas, with wet alder (*Alnus glutinosa*) - dominated woodland and willow (*Salix* spp.) carr present along sections of the site's streams and flushes. (Figure 8).

Historically, the Wyming Brook area is likely to have been vegetated by botanically species-poor sessile oak (*Quercus petraea*) and birch (*Betula* spp.) W16 woodland common to moorland edge cloughs in the Peak

District, although the 1840 OS 1 inch to 1 mile map indicates that the majority of the area had been cleared of trees by that time. The regenerating woodland has been greatly modified over the past c.150 years by the introduction of a wide variety of coniferous species, sweet chestnut (*Castanea sativa*) and beech (*Fagus sylvatica*).

Conifer plantation

A few stands of coniferous plantation are present on the reserve, notably compartments 589c, a small part of 590b and 590 j-l. (Figure 8). In these areas the canopy is mature and even aged, the understory sparse and confined to shade tolerant species such as holly (*Ilex aquifolium*) and the ground flora species-poor and dominated by bramble (*Rubus fruticosus* agg.) and bracken (*Pteridium aquilinum*), although scattered wood sorrel (*Oxalis acetosella*) and opposite leaved golden saxifrage *Chrysosplenium oppositifolium* persist.

Mixed woodland

Mixed deciduous/coniferous woodland covers 32 hectares of Wyming Brook and comprises the most extensive habitat type present on the reserve. The coniferous component of the canopy is complex and highly variable across the site, with Scots pine (*Pinus sylvestris*) and European larch (*Larix decidua*) the species most frequently present, with smaller numbers of Corsican pine (*P. nigra laricio*), Norway spruce (*Picea abies*), white spruce (*P. glauca*), Sitka spruce (*P. sitchensis*) and Douglas fir (*Pseudotsuga menziesii*) also present in some areas. The deciduous component of the canopy is more homogenous and is dominated by oak, birch (silver and downy) or rowan (*Sorbus aucuparia*), with sycamore (*Acer pseudoplatanus*), sweet chestnut or beech locally dominant.

The woodland understory comprises downy birch and rowan, with occasional large holly and elder (*Sambucus nigra*) and extensive bramble. Tree saplings are also an important component of the understory across the reserve with the canopy species oak, beech, birch and sycamore all well represented. Heather (*Calluna vulgaris*) and bilberry (*Vaccinium myrtillus*) are also regular components of the woodland understory in compartments on the western side of the reserve.

The ground-flora across these woodlands is species-poor, and typical of that found on poor upland, acidic soils across the region. Wavy hair-grass (*Deschampsia flexuosa*), creeping soft-grass (*Holcus mollis*) are characteristic components of the ground flora and the reserve's rocky outcrops and north-facing aspect allow it to support a large biomass of ferns and bryophytes (see also 'Bryophytes and lichens' below).

The mixed woodlands of Wyming Brook contain a range of age classes of trees. A large number of mature trees, both coniferous and deciduous, are present. The oldest area of plantation woodland is that at Fox Holes on the reserve's eastern edge: the beech trees here are believed to have been planted in c. 1880 making them approximately 140 years old. Few veteran trees are present on the reserve, unsurprising given how recently much of it has become wooded. A recent survey (Riley, 2016) identified only 5 trees of veteran status, these comprise 2 silver birch, two rowan and one oak. A further 24 specimens were described as notable, including both coniferous and deciduous species. Most of these are of "standard" form but a number of worked oak and sweet chestnut are present.

Tree regeneration is widespread throughout the mixed woodlands but is largely confined to deciduous species, in particular birch in more open area and rowan, holly and beech under a canopy. Regeneration of pine and spruce is rare, except in more open areas, however some regenerating yew (*Taxus baccata*) have been noted.

The mixed woodland in cpt 589 is marked as plantation on an ancient woodland site on Natural England's ancient woodland inventory. Here the ground flora contains species such as dog violet (*Viola riviniana*), greater stitchwort (*Stellaria holostea*) and bluebell (*Hyacinthoides non-scripta*) indicative of ancient woodland sites.

Semi-natural deciduous woodland

Deciduous (broadleaved) woodland is relatively rare but does occur in pockets across the reserve, particularly on the heathland fringe (cpt 590a) and adjacent to the reserve's streams and watercourses. Two types of broad-leaved woodland are present. In drier, open areas successional processes have resulted in the development of young birch woodland with a ground flora of wavy hair-grass, creeping soft-grass, bilberry, heather and bracken. Oak and rowan are present in small numbers and, given time, these areas will mature into W16 upland oak wood, a climax community for this terrain.

In wetter areas, on slip-zones and along streams and flushes, areas of wet woodland occur. Some, particularly along streamsides, retain a canopy of mature alder, whilst in areas of more widespread flushing willow carr has developed. In all cases these areas of wet woodland support greater botanical diversity than adjacent drier areas. This ground flora is not homogenous but depends on the volume and nutrient levels of the water source. Where flushes form in nutrient-poor areas, such as at Reddicar Clough (cpt 590c), extensive areas of *Sphagnum* are found, whilst more nutrient rich flushes may be dominated by rushes such as *Juncus effusus*. In other areas, such as along the Rivelin Brook, a varied ground flora is present, including species such as meadow buttercup (*Ranunculus repens*), brooklime (*Veronica beccabunga*), marsh thistle (*Cirsium palustre*), and the ancient woodland indicator species wood sorrel and opposite-leaved golden saxifrage (*Chrysoxylum oppositifolium*). Stands of the invasive species Indian balsalm (*Impatiens glandulifera*) and pink purslane (*Claytonia sibirica*) are also present along the Rivelin Brook in compartments 589a and 589b.

Heathland

The south-western fringe of the reserve comprises birch woodland grading into heathland. This heathland was formerly managed as grouse moor through rotational burning and was therefore botanically degraded. At the current time a fence has been erected, in parts along the reserve boundary, dividing the reserve's heathland into that outside the fence line (cpts 590p and n), which is managed for grouse through sheep grazing and rotational burning, and that inside the fence line, which is ungrazed and managed only by manual cutting and scrub control.

This heathland is a homogenous dry heath dominated by heather, with frequent bilberry and occasional cowberry (*Vaccinium vitis-idaea*). Bracken is occasional and generally scattered in areas which are burnt, with beds of dense bracken present inside the fence line. Acid-loving grasses, including purple moor-grass (*Molinia caerulea*) are present in small quantities throughout and rosebay willowherb (*Chamerion angustifolium*) is present in areas recently disturbed by burning.

Only at Reddicar Clough (compartment 590c & d) does Wyming Brook nature reserve contain substantial areas of heathland, analogous to the *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* (H21) community described by the National Vegetation Classification (NVC). In compartment 590c, a rich mosaic of dwarf shrubs including bilberry, hybrid bilberry, heather, crowberry (*Empetrum nigrum*), cowberry, cross-leaved heath (*Erica tetralix*) and bell heather (*Erica cinerea*) dominates. A lack of burning and sparse grazing has allowed these species to grow to maturity.

In wetter areas (compartment 590d), heath communities grade into acid mire communities. Species previously recorded here include hare's-tail cotton grass (*Eriophorum vaginatum*), purple moor grass (*Molinia caerulea*), tufted hair-grass (*Deschampsia cespitosa*), cranberry (*Vaccinium oxycoccus*) and a well-developed sphagnum flora.

Species

Bryophytes and Lichens

The position of Wyming Brook nature reserve on a north-facing hillside, and the recent lack of disturbance, has allowed its lower plant communities to flourish. Bryophytes and lichens are common throughout the woodland and heathland habitats. The woodlands' boulder slopes and crags support a number of shade-

loving lichens, including *Cystocoleus nigra*, *Cladonia polydactyla*, *Lepraria incana*, *Micarea botryoides*, and the rare *Arthonia arthonioides*. The epiphytic, pollution-sensitive lichens *Evernia prunastri* and *Ramalina farinacea* are present on many tree trunks, and the common *Hypogymnia physodes* has formed well-developed communities on the older larch.

The woodland ground flora contains a significant bryophyte component, with *Eurhynchium praelongum* and *Mnium hornum* both widespread. Dry boulders throughout the woodland support communities of *Campylopus paradoxus* and *Dicranella heteromalla*. The old retaining wall, running along the site boundary adjacent to Wyming Brook Drive, is also an important habitat for bryophytes, particularly the liverwort *Pellia epiphylla*.

A bryophyte study of the Wyming Brook was commissioned by Yorkshire Water in 1999, as a prelude to the use of the stream for the portage of water between the reservoirs. 45 species of bryophyte were recorded along the stream corridor, with *Cephalozia bicuspidate*, *Mnium hornum*, *Pellia epiphylla*, and *Pseudotaxiphyllum elegans* being abundant along its length. One nationally scarce species, leafy liverwort (*Barbilophozia atlantica*) is present in very small and scattered populations within the gorge. *Hylocomium armoricum*, *Scapania gracilis* and *Scapania umbrosa*, are also present along the stream. These species have a high international conservation value as representatives of the Atlantic and sub-Atlantic flora. A dearth of similar, local studies makes it difficult to assess the significance of the bryophyte communities, but anecdotal evidence suggests that it may be a site of regional importance.

Bryophyte diversity was found to increase with decreasing altitude, reflecting the increase in suitable habitats and microclimatic conditions lower down the gorge. This pattern of diversity is also reflected by the stream's liverwort flora. The majority of species utilise the boulders and rock outcroppings of the stream bed, with fallen trees and the grassy margins of the stream also being colonised.

The reserve's heathland, flushes and bogs also support an extensive bryophyte flora. A survey of the wet flushes was carried out by Paul Ardron in 2003. He recorded 13 different species of *Sphagnum* moss, along with 15 other species of moss including *Aulacomnium palustre*, *Polytricum commune* and *Hypnum jutlandicum*. Four liverworts were also noted, *Lophocolea bidentata*, *Pellia epiphylla*, *Plagiochila asplenoides* and *Scapania*. *Sphagnum* mosses form an important component of these flush communities and those that have been recorded on Reddicar Clough, include *Sphagnum capillifolium*, *S. fimbriatum*, *S. palustre*, *S. quinquefarium*, *S. recurvum*, *S. subnitens*, and the uncommon *S. papillosum* and *S. russowii*.

Fungi

Little is known about the fungal communities of Wyming Brook and such data as is available is the result of casual records rather than systematic recording effort. The high amount of dead wood, and damp areas adjacent to the stream and brook mean that good populations of *Xerocomus pruinatas*, the uncommon Morel-like fungus, *Gyromita esculenta*, and *Amanita submembranacea* have been recorded here. In addition, a walk-through survey in 2010 recorded 28 species of fungi, including the blusher (*Amanita vaginata*), the brown roll-rim (*Paxillus involutus*), the greasy tough shank (*Collybia butyracea*), fly agaric (*Amanita muscaria*) and wood blewit (*Lepista nuda*).

Invertebrates

Wyming Brook nature reserve supports elements of both upland and lowland invertebrate communities, reflecting its transitional position on the moorland fringe and the relatively sheltered nature of much of the reserve.

Both Wyming Brook and Fox Hagg nature reserves have entries in the Invertebrate Site Register indicating that the wider area has a high invertebrate interest. Caution must be exercised when assessing the invertebrate records for the reserves, as the paucity of the data and the time over which it was collected preclude any detailed decisions from being drawn. However, although the dataset is generally thin, the relatively high number of macro-moth and hoverfly species, and the percentage of uncommon species detected through limited recording, indicate that the reserves are of considerable invertebrate interest.

Many of the invertebrates included in the dataset for Wyming Brook nature reserve are characteristic of moors, heaths and woodland. Several species associated with marshy habitats, for example the small wainscot moth (*Photedes pygmina*) and the hoverflies *Platycheirus angustatus*, *Platycheirus granditarsa* and *Cheilosia albitarsis* are also present.

No systematic survey of the reserve's invertebrate fauna has been carried out. A rare dipteran fauna has previously been noted as the main interest on Wyming Brook site. This included two Notable (Red Data Book) hoverflies *Xanthandrus comtus* and *Xylota coeruleiventris* and the locally uncommon *Platycheirus rosarum*, *Chrysotoxum arcuatum* and *Dasydyrphus pinastri*.

Forty species of macro moth have been recorded on the reserve. Several locally important species of lepidoptera, including ling pug (*Eupithecia goossensiata*), narrow wing pug (*E. nanata angusta*), Welsh wave (*Venusia cambrica*) and green hairstreak butterfly (*Callophrys rubi*), were recorded along Reddicar Clough. The nationally notable angle-striped sallow (*Enargia palacea*) is also present.

More recently, the Wyming Brook invertebrate fauna was surveyed by the Environment Agency. Fifty-four taxa were recorded, following kick-samples in the stream. The data was used to calculate BMWP (Biological Monitoring Working Party) and ASPT (Average Score Per Taxon) scores, which indicate that the water quality of the Wyming Brook is excellent, supporting several pollution-sensitive invertebrate families.

A moth survey was conducted between 1999 and 2004, with over 100 species of moths recorded.

A butterfly survey in 2010 recorded 10 species at Wyming Brook, consisting of 3 whites (*Pieris*), small copper (*Lycaena phlaeas*), small tortoiseshell (*Aglais urticae*), peacock (*Aglais io*), comma (*Polygonia c-album*), speckled wood (*Pararge aegeria*), gatekeeper (*Pyronia tithonus*) and meadow brown (*Maniola jurtina*) were recorded. In addition, brimstone (*Gonepteryx rhamni*) and wall brown (*Lasiommata megera*) have been recorded in recent years.

Fish

The Environment Agency (EA) undertook an experimental introduction of brown trout (*Salmo trutta*) into the Wyming Brook in 2004, with 27 individuals introduced. In 2005 and 2014 resurveys showed a population of brown trout with a range of age classes. It is clear, therefore, that the population is persisting.

The EA also introduced bullhead (*Cottis gobio*) to the brook in 2011. A single bullhead was recorded in the Wyming Brook in 2014.

Reptiles and Amphibians

Common lizards (*Lacerta vivipara*) have been sighted on the heathland on the western boundary of the reserve. Common frogs (*Rana temporaria*) are present in large numbers along Rivelin Brook.

Although frogs, toads and viviparous lizards have been recorded on the reserve, information regarding their extent and distribution is sparse.

Birds

Wyming Brook has long been recognised as an important ornithological area for resident species and also for the regular summer migrants found there. A detailed breeding bird survey of Wyming Brook, Fox Holes Plantation and Fox Hagg was carried out by Jim Clarke in 2011. A total of 83 species of birds were recorded on or over the reserves, with 49 holding territory and 32 proven to be breeding on site.

As may be expected, the reserve's most common birds are woodland species, namely willow warbler (*Phylloscopus trochilus*), coal tit (*Periparus ater*), wren (*Troglodytes troglodytes*), chaffinch (*Fringilla coelebs*) and robin (*Erithacus rubecula*).

A total of 11 red listed birds of high conservation concern have been recorded at Wyming Brook (**Table 6**). Three of the most important species at the site are nightjar (*Caprimulgus europaeus*), wood warbler (*Phylloscopus*

sibilatrix) and spotted flycatcher (*Muscicapa striata*) whose populations on the reserve rival those of any other sites in the North East Peak District and the Sheffield area.

Song thrush (*Turdus philomelos*) populations at the site are consistent with those expected for the habitat and large populations of linnet (*Carduelis cannabina*) are using the reserve, especially the area alongside Ash Cabin. Species holding just one territory include lesser redpoll (*Carduelis cabaret*) and tree pipit (*Anthus trivialis*).

A total of 15 amber listed birds of medium conservation concern were recorded at the site (**Table 6**). Swallows (*Hirundo rustica*) and house martins (*Delichon urbica*) frequently forage over the reserve. Mistle thrushes (*Turdus viscivorus*) are nesting in the reserve and feeding in the surrounding agricultural land. The population of pied flycatchers (*Ficedula hypoleuca*) is small but significant due to declining national populations and because of the reserve's position on the margins of this species' range. There are notably large populations of woodcock (*Scolopax rusticola*) and bullfinch (*Pyrrhula pyrrhula*), and both species are known to be breeding on site. Dippers (*Cinclus cinclus*) are also breeding in the reserve and using the brooks for feeding.

Table 6: Species of conservation concern recorded at Wyming Brook.

Red listed species of high conservation concern		Amber listed species of medium conservation concern	
Woodcock	<i>Scolopax rusticola</i>	Stock dove	<i>Columba oenas</i>
Cuckoo	<i>Cuculus canorus</i>	Tawny owl	<i>Strix aluco</i>
Wood warbler	<i>Phylloscopus sibilatrix</i>	Night jar	<i>Caprimulgus europaeus</i>
Song thrush	<i>Turdus philomelos</i>	Willow warbler	<i>Phylloscopus trochilus</i>
Mistle thrush	<i>Turdus viscivorus</i>	Dipper	<i>Cinclus cinclus</i>
Spotted flycatcher	<i>Muscicapa striata</i>	Dunnock	<i>Prunella modularis</i>
Pied flycatcher	<i>Ficedula hypoleuca</i>	Meadow pipit	<i>Anthus pratensis</i>
Grey wagtail	<i>Motacilla cinerea</i>	Bullfinch	<i>Pyrrhula pyrrhula</i>
Tree pipit	<i>Anthus trivialis</i>	Mallard	<i>Anas platyrhynchos</i>
Linnet	<i>Carduelis cannabina</i>	Honey buzzard	<i>Pernis apivorus</i>
Lesser red poll	<i>Carduelis cabaret</i>	Swift	<i>Apus apus</i>
		House martin	<i>Delichon urbicum</i>
		Kestrel	<i>Falco tinnunculus</i>
		Meadow pipit	<i>Anthus pratensis</i>
		Red grouse	<i>Lagopus lagopus</i>

Winter visitors to Wyming Brook include redwing (*Turdus iliacus*), which is a red listed bird, and brambling (*Fringilla montifringilla*), which is listed on Schedule 1 of the Wildlife and Countryside Act 1981.

Conifer plantation is the favoured habitat of species such as goldcrest (*Regulus regulus*), crossbill (*Loxia curvirostra*) and firecrest (*Regulus ignicapillus*). Goldcrest is one of the more common species present at Wyming Brook, but populations may have been reduced by recent cold winters. A large influx of crossbills arrived at the site during the summer of 2011, however it was too late in the season for them to breed. Firecrest was absent during the 2011 surveys, but is known to have bred or summered on the reserve in recent years.

Species noted flying over the site include osprey (*Pandion haliaetus*), oyster catcher (*Haematopus ostralegus*), lapwing (*Vanellus vanellus*) and curlew (*Numenius arquata*).

Illegal bird snares have occasionally been found on the reserve, in particular in cpts 589 and 590o. The Trust permits no trapping whatsoever on the reserve and where snares are detected they will be removed and the Wildlife Crimes officer contacted.

Mammals

Historic records of mountain hare (*Lepus timidus*), stoat (*Mustela erminea*), mole (*Talpa europaea*), rabbit (*Oryctolagus cuniculus*), and fox (*Vulpes vulpes*) exist for Wyming Brook nature reserve.

Grey squirrel (*Sciurus carolinensis*) are widespread throughout the reserve.

Water vole (*Arvicola amphibious*) are known to breed on land adjacent to the reserve, however, the stony banks of Wyming Brook and Rivelin Brook do not constitute ideal habitat for water vole, and they have not been recorded on the reserve. Water shrew (*Neomys fodiens*) have been recorded along the Rivelin Brook. Roe deer (*Capreolus capreolus*) are present across the reserve.

Bats are frequently observed feeding on site. Previously, the survey information available for Wyming Brook in relation to bats is very restricted and derived from ad hoc surveys or incidental records provided by South Yorkshire Bat Group. Recent monitoring and trapping on the reserve has confirmed the presence of 5 species, as follows: Brant's bat (*Myotis Brandtii*), whiskered bat (*Myotis mystacinus*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*). Of these whiskered bat are uncommon regionally whilst Brant's bat is very rare. It is thought likely that Daubenton's bat (*Myotis daubentonii*) is present on the reserve, given the suitability of the habitat and its occurrence nearby, although this has not yet been confirmed.

The site is considered to offer high suitability for roosting bats to be present, however specific survey work to establish this has not been undertaken. The current information suggests that the reserve may be regionally important for bats.

Snares and stink pits are employed by the adjacent Moscar estate, and are often found in the vicinity of the reserve, posing a threat to its mammalian fauna. Illegal snares have occasionally been found on the reserve, in particular in cpts 589 and 590o. The Trust permits no trapping whatsoever on the reserve and where snares are detected the Police Wildlife Crimes unit will be contacted.

2.4 Infrastructure

Paths, Tracks and By-ways

Wyming Brook Drive comprises the major structural feature on the reserve. The drive runs through the centre of the reserve and is the only vehicular access route to the site. Measuring approximately 1,300 metres in length and 4 metres in width, it was constructed at the beginning of the 20th century and was initially cobbled. Since its construction it has been resurfaced and patched using a variety of materials

including limestone, sandstone, concrete, and tarmac. Parts of the drive have also been resurfaced to make it more accessible to wheelchairs and mobility scooters.

Wyming Brook Drive is supported by retaining walls in places, and ditches and culverts used to shed water from it, or to allow water to pass across it. A structural report carried out during 2001 by Sheffield City Council Structural Engineers, concluded that it was in excellent condition with no major weaknesses, however storms in 2014 resulted in the collapse of a section of one retaining wall. This section remains unrepaired at the time of writing.

A car park with parking for approximately 20 vehicles is present at the southern end of the Drive, this can be accessed from Redmires Road. It is also surfaced. A bay with parking for 3 vehicles is present at the A61 entrance to the reserve.

Other than Wyming Brook Drive, only a short section of path running from the car park towards the stepping stones is surfaced. The remaining Public Rights of Way on the reserve are all unsurfaced footpaths, with stepping stones, stiles, and bridges installed to aid access over the reserve's streams and boundaries.

Access Furniture

Access is controlled at the site entrances by the existence of vehicle gates, horse hops and A-frames.

There are eight benches located around Wyming Brook; five along the central drive and 3 along the Wyming Brook. A bird-feeding station is present near the southern entrance, with a wheel-chair friendly picnic table in the same area. Both features are in a good state of repair.

There is a Wildlife Trust sign on Redmires Road at the entrance to the car park, plus another in the car park itself, one at the Rivelin Damns entrance and one at the northern end of the reserve.

Walls, Fences and Other Boundaries

Drystone walls and stock proof fencing run along the eastern boundary of Wyming Brook. These are in various states of repair but are functioning as protective boundaries and are largely owned by the adjacent properties.

The boundaries of Wyming Brook nature reserve vary in type and condition. A substantial wetstone retaining wall delineates the north-eastern boundary to the reserve where the gradient is steep, alternating with stock netting where the slopes are more gentle. The boundary wall running parallel to the Rivelin Brook on the north-western boundary is in good condition and stock-proof, with the adjacent farmland grazed by sheep. The drystone wall along the southern boundary of Fox Holes Plantation is in poor condition and has collapsed in many places.

A post and wire fence was installed along the moorland fringe in on the reserve's western boundary 2008/9 and acts to prevent the movement of sheep off the adjacent moor into the reserve. However, it should be noted that this fence does not mark the exact boundary of the reserve and parts of the reserve are now on the "wrong" side and managed as grouse moor.

The drystone wall along the south-eastern boundary is in poor condition and only serves as a boundary along certain sections. Stock proofing is in place where livestock are kept in the fields surrounding the reserve but in some places there is only loosely held together dry stone walling between woodland and fields where horses are kept.

Many of the internal drystone walls at Wyming Brook nature reserve are in poor condition and, whilst they are often of historical interest, they no longer serve any functional purpose. Therefore there are no immediate plans for repair of these internal walls except for the wetstone retaining walls, which will be constantly monitored for signs of deterioration.

2.5 Cultural Context

Archaeological interest and existing features (Figure 9)

The following information is sourced from an archaeological report undertaken in 2001 by Ed Dennison Archaeological Services.

Prehistoric Period

There is evidence of human activity during the Mesolithic (c.8,300-3,500 BC) and Neolithic (c.3,500-1,800 BC) periods on the East Moors, immediately adjacent to what are now Wyming Brook and Fox Hagg nature reserves. The Bronze Age (c.1,800-1,000 BC) saw extensive clearance of land on the East Moors, with evidence of permanent settlements, agriculture and burial sites, including several barrows that were excavated close to Lodge Moor Hospital (that is now a housing development). There is little evidence of Iron Age (1000 BC – 43 AD) activity in the immediate vicinity of the reserves.

Within Wyming Brook nature reserve, in the area known as Burtinat, there is recorded a settlement consisting of hut platforms and circular and oval enclosures, a hut circle, and a barrow of probable Bronze Age date. However, at the time of the current survey, all of these sites were covered in deep and dense heather or bilberry, and were not positively re-identified. A second concentration of prehistoric sites lies within the area known as Ash Cabin Flat, on the western edge of the reserve. One is a double-walled enclosure, another a small D-shaped promontory fort, both probably dating to the Bronze or Iron Ages, and a third site is a chert-working site, which may belong to a much earlier period. However, again none of these sites could be positively re-identified during the full survey of 2001.

A total of 12 presumed prehistoric sites have been identified in land immediately adjacent to the reserve, including a number of flint or chert fragments close to Redmires Road; a cist and cairns, hut circles and fields and a cleared terrace close to New Hagg (near Reddicar Clough); and cairns and a stone circle located on Ash Cabin Flat. The latter is believed to be of late Neolithic to Early Bronze Age, and is a Scheduled Ancient Monument.

Roman & Anglo-Saxon Periods

The only site within the immediate vicinity of the reserves dating from Roman times (AD 43-410) is a section of a long distance Roman road (Long Causeway) linking Chester with Lincoln. The route follows, or is close to, Redmires road where it adjoins the southern-most boundary of Wyming Brook nature reserve.

No specific artefacts from the Anglo-Saxon Early Medieval Period (AD 410-1066) have been found within or in the immediate area of the reserve, although there is considerable evidence of Anglo-Saxon origins in many nearby towns and villages.

Medieval Period (AD 1066-1540)

The reserve lies within an area known as Hallam in the Domesday Book, which was noted as containing c.16,000 acres of wood pasture. Medieval records indicate that whilst some of the lower slopes and valleys in the vicinity of the reserve would have been settled and cultivated, with wood pasture playing an important part in the local economy, much of the area was reserved as a chase for hunting by the lords of Sheffield. No medieval sites are known from within the reserve.

Post-Medieval Period (AD 1540 onwards)

The region immediately surrounding the reserves remained sparsely populated throughout the early to mid post-medieval period, and little industrial activity took place, although cutlery works were developed on the lower parts of the River Rivelin. Some fields were enclosed on Ash Cabin Flat by 1795, with much of the remainder remaining open until at least c.1840. The vast majority of archaeological sites recorded within the reserve date from the 19th or 20th century, although a few may predate this time, e.g. a small reservoir c.50 metres long by 30 metres wide with a low bank, to the north of New Hagg.

The Rivelin reservoirs were constructed by the Sheffield Water Company, and designed by John Towlerton Leather using banks of clay puddled earthworks, and were completed by 1848. Management was later taken

over by the Sheffield Corporation, and two boundary stones marked with “SCWW” (Sheffield Corporation Water Works) are located to the southwest of the reservoirs, immediately adjacent to the western boundary of the reserve. The most notable landscape feature within the reserve is Wyming Brook Drive, which was constructed by Sheffield City Council to improve public access and create a public amenity. The work was carried out as part of an employment creation scheme, and completed in 1912. A number of features are associated with the drive, including drystone walls, retaining walls, gritstone bridges and culverts, a small horse-watering pool, and three small sandstone quarries and gravel pit. The reserve also contains several old footpaths, and remnants of old sheepfolds on the moorland fringes. There are also a number of other unidentified archaeological features scattered around the reserve.

The only woodland within the reserves that was noted on the 1840 Ordnance Survey 1 inch to 1-mile map is Fox Holes Plantation (then named Wyming Brook Plantation). The majority of Wyming Brook nature reserve was wooded on the 1846 Stannington Storrs & Dungworth title map, with the exception of the area of Rivelin Brook. The latter area had also become wooded by 1905. The western upland fringes of Wyming Brook nature reserve remained as open grouse-shooting moorland, and several grouse drinking bowls are evident within the reserve, dating from 1911-12.

Community

The communities living adjacent to the reserve reside in the ward of Fulwood. The population of this ward contains a large number of people in the 20-24 age bracket, due to the proximity of the ward to the city’s universities. In the immediate vicinity of the reserve however the majority of the population are of older working age (46-64) or retired, reflecting the high levels of home ownership and high cost of housing in the area.

Fullwood has lower rates of long-term illness, unemployment and economic inactivity than the Sheffield average. Levels of educational attainment are above the Sheffield average, as are levels of car ownership. All these factors suggest a comparatively wealthy population.

The population of Fullwood is a predominately white British, with 14.7% of residents identifying as being black or of another minority ethnic group.

Recreation

Visitor survey 2018

A visitor survey was conducted in 2018, with four on-site sessions taking place and 50 individuals being interviewed.

Walking, including dog walking, was the main pastime given for visiting the reserve (46% of respondents), whilst other popular pastimes included experiencing wildlife/nature (16%) and picnicking (10%). Cyclists make up an increasing percentage of site visitors (6%), whilst horse-riding remained steady at 2%.

As with previous surveys, this one showed that naturalistic character and attractiveness of the reserve are the major attractions for visiting, as are location (many visitors choose it as it is local to them) and the availability of a wide variety of tracks and the availability of parking. “Shade” was also given as a major reason for visiting, especially by dog owners, perhaps reflecting the unusual duration of hot weather in summer 2018.

The majority of visitors questioned travelled to Wyming Brook nature reserve by car (61%) but significant numbers also travel on foot or by horse or bike (39%).

Overall people were happy with the work done by the Sheffield and Rotherham Wildlife Trust and are pleased with the current level of management and maintenance. There is general agreement that future management should concentrate on retaining the ‘wildness’ of the reserve and limit facilities for humans.

The survey suggests that the major issues concerning visitors are related to site use and that conflict exists between the different user groups. The main issues being dog walkers failing to control their dogs, especially around horses, and not removing dog faeces. Other visitors stated that mountain bikers ride too

fast along the paths without regard for other users and that motorbikes (not permitted on site) occasionally cause problems on the reserve.

Communities of Interest

Several distinct ‘communities of interest’ can be identified for the reserve.

The first of these is recreational **walkers**, as represented by the Ramblers Association and the Sheffield Campaign for Access to Moorland (SCAM). Both groups have a long-standing interest in the site and adjacent moorland. Walking is the most common recreational pastime on the reserve, with visitors either taking circular routes around it, or incorporating it into a longer walk across the adjacent hillside.

Dog walking is also a common activity on the reserve, with many frequent walkers citing this as the main reason for their visit. During summer 2018 it became apparent that the reserve is particularly attractive to dog walkers during hot weather, as it offers shady walks with access to water during times when owners are advised to take care to avoid over-heating their dogs during exercise.

Wyming Brook nature reserve forms part of a circular route for **horse-riding**. It is frequently used by local riders but does not attract riders from elsewhere due to a lack of parking for horse boxes.

Mountain biking is a growing sport nationally, locally and in the vicinity of the reserve. Mountain bikers frequently use Wyming Brook Drive – and sometimes the reserve’s footpaths - as part of a longer route through the Rivelin Valley. With a new downhill route planned for an adjacent site, it is anticipated that the number of mountain bikers in the general vicinity and the reserve is set to increase.

Wyming Brook nature reserve’s wildlife (fauna and flora) attracts **naturalists** from across the city, and the site is particularly popular with botanists, ornithologists and entomologists. Several environmental organisations, including the Sorby Natural History Society, the Sheffield Bird Study Group and the Rivelin Valley Conservation Group have a long-standing relationship with the site.

Motorcyclists also use the reserve illegally, and have caused significant erosion in certain areas, though this is less of a problem in recent years.

The Wildlife Trust for Sheffield and Rotherham recognise the significance of local community involvement in the management of Wyming Brook and Fox Hagg, and the potential to increase the involvement through consultation and involvement with decision-making both on the strategic approach to management as well as the work programme. The community have been most helpful in the construction of this management plan. The Wyming Brook and Fox Hagg reserve advisory group has been running for several years and their involvement has been most welcome. The Trust will look to continue to use the Reserve Advisory Group as a source of information and consultation.

Outdoor learning

There are several schools near the reserves (although none within easy walking distance), all of which perform well above the Sheffield average, and the national average, in terms of academic achievement. There are no records of schools independently using Wyming Brook nature reserve as a destination for educational activities or visits.

Although there is some potential to carry out outdoor educational trips and activities on the reserve, a number of issues: the reserve’s topography, its ecological sensitivity, lack of suitable parking and turning for coaches, lack of toilets and shelter, limit this. The Trust has no plans to develop Wyming Brook for Outdoor Learning during the course of this management plan.

2.6 Economics and Marketing

Past funding

Wyming Brook nature reserve has received considerable investment over the past 150 years. Initial investment dates from the pre-1920s and was used to plant up the woodlands with conifers, and in the creation and maintenance of Wyming Brook Drive (prior to the construction of the A57), and other site infrastructure.

Since the Trust took on the management of Wyming Brook, the majority of nature reserve has been under a Woodland Grants Scheme and, more recently, has been entered into DEFRA's Countryside Stewardship scheme which has replaced this.

Yorkshire Water have funded improvements to the reserve's footpath network, including access controls and the resurfacing of the top section of Wyming Brook Drive, in conjunction with the project to increase water flows down the Wyming Brook.

The Heritage Lottery Fund has also funded major capital works on the site for a 5-year period (2001 to 2006).

Funding for woodland & heathland management came through the Biodiversity Action Fund (BAF) between 2008 and 2011.

Productive land-use

No productive land use initiatives are operational on the reserve. When the woodland is thinned to improve its structure, timber arisings are extracted and sold where possible. However the difficulty in extracting timber from much of the site means that such operations rarely make a surplus; rather timber is sold to ameliorate the cost of the forestry operation. There is no expectation that commercial forestry operations will be carried out on the reserve during the period covered by this plan, although the arisings of major forestry operations will be sold if and when extraction is possible. It is also worth noting that major forestry works will be undertaken in adjoining woodlands during the course of this plan and these may impact on the reserve.

Current and future funding schemes, income and grants

Wyming Brook is currently enrolled in Forestry Commissions Countryside Stewardship scheme (CSS) – starting 2017 and running for 5 years. Through this scheme the site receives a Woodland Improvement Grant which supports work to improve woodland condition for biodiversity or to enhance resilience to climate change.

The reserve also falls within the Sheffield Moors Partnership area and the Sheffield Lakeland Landscape Partnership area and will receive funding through the latter for works included in this plan.

Sheffield and Rotherham Wildlife Trust Membership Recruitment

Wildlife Trust membership across the city is steadily increasing as a more pro-active approach to membership recruitment has taken place in recent years. When recruitment campaigns have been targeted at neighbouring communities these have met with a large degree of success. There is great potential to recruit members in the Wyming Brook area, and the high quality management and interpretation will go some way towards generating members.

Printed materials

Wyming Brook is also included in Sheffield and Rotherham Wildlife Trust's Nature Reserves booklet, which gives details on where the site is located and how it can be reached, and in the Trust's Living Landscape brochure.

News and articles about the reserves are printed in Sheffield and Rotherham Wildlife Trust's Kingfisher magazine, which is sent out to members three times a year. Press releases are sent to the Sheffield Star and the Sheffield Telegraph.

Websites

Wyming Brook nature reserve has a page on the Sheffield and Rotherham Wildlife Trust website. This gives general information about the reserve and access to electronic versions of information leaflets. <http://www.wildsheffield.com/nature-reserves/our-reserves/wyming-brook>

The location of Wyming Brook and information about the reserve is also included on the Green Flag website. <http://greenflag.keepbritaintidy.org/park-summary/?ParkID=1457>

3.0 RESERVE VISION AND FEATURES OF INTEREST

3.1 Vision Statement

Our vision for Wyming Brook by 2070 is:

Spanning the transition between upland and lowland, the zone where the moorland of the Dark Peak falls away to wooded river valley, Wyming Brook is a site rich in wildlife.

On the reserve's western fringe, heather-dominated moorland grades into W16 oak-birch woodland. A population of common lizard (*Zootoca vivipara*) are present here.

Moving east, the steep slopes and deep-cut valleys are vegetated by mature broadleaf woodlands dominated by oak, with some mature conifers.

The reserve's streams retain a reliable water flow and are home to a good population of freshwater invertebrates which, in turn, support populations of brown trout.

The reserve is a good place for birds, with over 30 species breeding here on a regular basis, including nightjar, tree pipit, wood warbler, pied flycatcher, spotted flycatcher, dipper and redstart. The reserve is also of regional importance for bats.

The reserve remains visually striking, the variation in texture and colour of the different tree species providing an attractive scene when viewed from its periphery or from Wyming Brook Drive. Boulders and crags are striking features of the landscape, and support a range of mosses and lichens.

The reserve's woodlands are structurally complex and contain a large number of mature trees; these are tall and well-spaced, giving the canopy an architectural quality. Deadwood, both standing and fallen, is an important component of the woodland across the reserve.

The site's man-made features are minimal, well-kept; and in keeping with the naturalistic 'feel' of the site, and the surrounding countryside.

Pathways offer a variety of routes around site, and vary in grade from the wide, smooth surface of Wyming Brook Drive, to the windy, rocky paths of the periphery.

Views across the Rivelin Valley are available from high points on the moorland edge.

The site is well-used by walkers, horse-riders and cyclists from across the city, yet retains an air of tranquillity and the sense of providing an escape from the hustle and bustle of city life. The majority of visitor usage is concentrated on Wyming Brook Drive, the streamside path and the open meadow adjacent to the car park. Other areas of the reserve see little recreational disturbance, with visitors sticking to well-established paths and desire lines.

Well-behaved dogs are welcome on the reserve; with dog owners assiduous about keeping them under control, and in picking up after them and in removing their waste from site.

3.2 Feature 1: Broadleaved Woodland

60+ ha of broadleaved woodland in good ecological condition by 2070, including 23 ha of upland oak woodland and 4 ha of wet woodland.

Attributes of woodland in good ecological condition

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
Species composition.	<p>≥ 70% of the canopy comprises native broadleaf species.</p> <p>≥ 8 native broadleaved tree and shrub species represented in the canopy and understory.</p> <p>In areas of upland oak woodland (W10) the dominant canopy species will be oak (<i>Quercus petraea</i> or the hybrid <i>Q. petraea x robur</i>), birch (<i>Betula</i> sp) and rowan (<i>Sorbus aucuparia</i>) with < 10% of the canopy comprising coniferous species.</p> <p>In areas of wet woodland the dominant canopy species will be alder (<i>Alnus glutinosa</i>) and/or willow (<i>Salix</i> sp) with < 10% of the canopy comprising coniferous species.</p>	Woodland Condition Monitoring
Successful broadleaf regeneration beneath canopy	<p>Evidence of browsing damage present across <40% of woodland.</p> <p>Evidence of regeneration present across >40% of woodland, of which 80% is native broadleaved species.</p>	Woodland Condition Monitoring
Woodland structure	<p>10 – 40% of woodland has areas of temporary open space, of at least 10m in diameter.</p> <p>Width of woodland edge habitat should be at least 1.5 times the height of the nearest mature tree.</p>	Woodland Monitoring Condition

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>	
Woodland structure cont.	Average of 3 different tree size classes present per 100m ² across woodland.** Average of 3 veteran trees in each ha**.	Woodland Monitoring	Condition
Dead Wood	>3 snags (standing dead wood including dead wood in live trees) per 100m ² across woodland. >50% of woodland area contains large* fallen dead wood (including large branches, stems, excluding stumps).	Woodland Monitoring	Condition

* >20cm diameter & >50cm long.

** Very mature/veteran (at least 80cm DBH) Mature/ mid-range (at least 35cm DBH) Young / Pole stage (at least 7cm DBH) Saplings (Over 50cm, under 7cm DBH) Seedlings (up to 50cm)

Reference: Woodland Condition Survey (2017), Online: (The England Woodland Biodiversity Group and Forest Research.).

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.

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Invasive non-native species	Rhododendron and Indian Balsam are present but scarce on the reserve. If no action is taken these species will spread, displacing the native flora.	Yes	No invasive non-native species (INNS) present in woodland.	Woodland Condition Monitoring (?)
Invasive native species (holly)	<p>This native species is spreading across woodlands in Sheffield, due to lack of natural control processes (grazing by deer and rooting by swine) and the cessation of past woodland management practices such as cutting for winter fodder.</p> <p>Without control holly forms dense thickets, displacing other species and preventing the regeneration of trees.</p> <p>Holly is currently spreading at Wyming Brook but is not yet problematic, except in Fox Holes plantation.</p>	Yes	<p>Holly cover is frequent over <50% of woodland.</p> <p>Holly cover is very frequent or continuous over <10% of woodland.</p>	Woodland Condition Monitoring
Topographical constraints	Large areas of the reserve are steep and inaccessible to people and machinery. This will constrain the type and rate of woodland management possible.	N/A	N/A	N/A

Factors	Rationale	Management Required	Technical Indicator of control	Monitoring
Tree disease	<p>Many species of native broadleaved trees are vulnerable to pathogens, several of which are active in the Sheffield area.</p> <p>Species known to be at imminent risk – ash, sweet chestnut – are present on Wyming Brook in small numbers. However, diseases of oak and beech are active in the UK and may pose a significant future threat to the woodland</p>	No, monitor	Persistence of oak, beech, and birch as dominant species in the woodland canopy, with at least 5 other native broadleaved species present on the reserve.	Woodland Condition Monitoring
Past management	Past management of the area has resulted in the introduction of conifers to the reserve, which in turn has affected the species diversity in the canopy, understory and ground flora and the reserve's soils, leaving it in unfavourable ecological condition.	Yes	<p>≥ 70% of the canopy comprises native broadleaf species.</p> <p>≥ 8 native broadleaved tree and shrub species represented in the canopy and understory across the reserve.</p>	Woodland Condition Monitoring
On-site archaeology	The reserve contains a number of features of archaeological interest. These may be vulnerable to damage during management operations, especially those involving ground disturbance or heavy machinery.	No, monitor	Archaeological features identified and, if necessary, protected during management operations.	Operational checklists (Appendix III)

Factors	Rationale	Management Required	Technical Indicator of control	Monitoring
Climate change	<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, fire events and gales should be a priority when management decisions are made.</p> <p>Long-term changes in climate may also 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>	No, monitor	No loss of wetland habitats across the reserve	<p>Woodland Condition Monitoring</p> <p>Site Risk Assessment.</p> <p>Fire Risk Assessment Plan</p>

Evaluation of current condition

The reserve currently contains 54 ha of woodland, of which 14 ha is broadleaved (deciduous), whilst 32 ha are mixed broadleaved/coniferous (> 10% conifers) and 8 ha are coniferous.

Coniferous woodland is not native to the Sheffield region and it is known that the conifers at Wyming Brook were introduced by the water board in the early 20th century. It is also known that, hectare for hectare, coniferous woodland in England does not support as much biodiversity as deciduous woodland, particularly when the coniferous woodland takes the form of even-aged plantation woodland. **The conversion of coniferous woodland to deciduous woodland at Wyming Brook would therefore provide overall benefits for reserve biodiversity.**

Analysis of the species-composition for natural regeneration of tree species at Wyming Brook shows the regeneration of deciduous species across the reserve. The regeneration of conifers (with the exception of yew, a native species) however, is overwhelmingly confined to the moorland fringe. This is due to the high light levels required by coniferous seedlings and saplings to thrive. **Without intervention, it is highly probable that the woodlands of Wyming Brook will become more dominated by deciduous species over time.**

The natural vegetation type for the vast majority of the reserve would be upland oak woodland and many areas of the reserve are gradually succeeding towards this community (the exception being wet areas where willow carr is forming). However, factors such as tree disease and climate change suggest that a more diverse woodland, with a component of additional canopy species such as beech and sycamore, may prove more resilient. **Consequently, the systematic removal of these species through management is not thought desirable, although oak retention may be favoured during thinning operations.**

It should also be noted that mature coniferous woodland, especially that where several different coniferous species are present, provides a valuable resource for conifer specialists, such as goldcrest, crossbill and firecrest. Mature conifers are also favoured as nesting sites by several species of raptor. The current trend in the woodlands of Sheffield and the Peak District is to remove conifer plantation and replace it with deciduous woodland. In consequence, our projection is that coniferous woodland, as a component of the landscape, will significantly decrease in the medium term. It is therefore argued that **the long-term retention of a coniferous element at Wyming Brook would prove beneficial, both in landscape terms and to support conifer specialists in the area.**

Holly, a native shrub, is spreading across woodlands throughout Sheffield. It is particularly problematic in combination with a beech canopy, where its spread is favoured by low light levels. Its abundance at Wyming Brook **will be monitored during the period covered by this management plan, with control of its spread being undertaken in Fox Holes Plantation.**

Woodland structure is also a key attribute of woodland in good ecological condition. Temporary open spaces (glades, clearings) are an important feature of woodland health as they provide habitat for early successional plants, basking spaces for invertebrates and reptiles and offer opportunities for the recruitment of tree seedlings. Temporary open spaces of at least 10m in diameter are currently found across 39% of the reserve's woodlands, meaning that the reserve meets this attribute of good woodland condition.

Woodland edge is defined as the transition zone between a maturing forest and adjacent habitats, such as grassland, crop land, or wetland. A well-developed woodland edge typically consists of plant communities that are intermediate in height when compared to adjoining habitat types. Many species make regular use of the edge habitats for feeding due to higher herb layer productivity and larger invertebrate populations. Productive woodland edge habitats are those where the width of the woodland edge habitat is at least 1.5 times the height of the nearest mature tree. At Wyming Brook 64% of the edge habitat falls within this category, the majority of which lies along the moorland fringe. **Due to successional processes and a lack of natural processes (grazing/browsing) to counteract this, this habitat will require proactive management in order to ensure its retention on site.**

Wetland features such as wet woodland, flushes and streams are a major feature of Wyming Brook and are widely distributed across the reserve. A baseline figure for the frequency and distribution of these habitats

was established in 2018 and their persistence on site will be subject to onward monitoring, in order that any drying of the reserve is detected.

Another structural factor affecting a woodland's biodiversity is its age structure, and particular, the presence of mature and senescent trees. Woodland with a diverse age structure provides more ecological niches for exploitation than even-aged woodland. Equally, mature and, in particular, veteran trees provide extremely important ecological resource, attracting a range of specialist saprophytic species not otherwise supported by younger vegetation. The structural complexity of such trees also allows them to provide suitable roost and nest sites for a range of animals, including the bats for which this site is of importance.

Wyming Brook currently supports a number of mature trees, many of which are conifers, but few notable or veteran trees of large size. The benefit of moving from conifer-dominated woodland to broadleaved woodland must therefore be balanced with the benefits associated with the presence of mature and ultimately veteran trees on the reserve. Consequently, **the shift from mixed woodland to broadleaved will be incremental and achieved by a gradual decrease in conifer cover across compartments** over the next 50 years. **The veteran and notable trees recorded on the reserve during the 2016 survey will be protected during woodland works and retained** (unless they become dangerous).

The presence of standing and fallen dead wood is an important feature of woodlands in good ecological condition, providing a habitat for a range of saprophytic species including 75% of the woodlands at Wyming Brook meet the target for dead wood, with 79% meeting the target for fallen. Consequently, the reserve's woodlands contain an acceptable dead wood resource, in the short-term, forestry operations may reverse this through the removal of mature trees which would otherwise become senescent. **Deadwood creation and retention activities will therefore be carried out over the period covered by this management plan to counteract this.**

The woodlands of Wyming Brook are browsed by deer, squirrel and (on the moorland fringe) hare. Evidence of browsing damage to trees was detected in 9% of the woodland surveyed during winter 2018, suggesting browsing pressure is currently well within the tolerance limits suggested for woodlands in good ecological condition.

Two invasive non-native species are present on the reserve. Rhododendron (*Rhododendron ponticum*) was recorded in 2 areas of the site, whilst patches of Indian balsalm are recorded along the length of the Rivelin Brook. **Control of these species will therefore be necessary during the period covered by this management plan.**

Management Objectives

1.0 60+ ha of broadleaved woodland in good ecological condition by 2070, including 23 ha of upland oak woodland and 4 ha of wet woodland.

- 1.1 To decrease the proportion of conifers in the canopy across 46 ha of the reserve by 2027 (**Figure 10**).
- 1.2 To provide for the long-term retention of conifers in compartments 590b and l, and compartment 588a (**Figure 10**).
- 1.3 To increase the proportion of woodland edge ecotone in good condition to 70% by 2027 (**Figure 10**).
- 1.4 To control the spread of holly in Fox Holes Plantation cpt 588b
- 1.5 To retain standing and fallen deadwood across the reserve and to actively recruit veteran trees.
- 1.6 To eradicate rhododendron and Indian balsalm from the reserve by 2027.

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: Bird community.

Reserve supports a diverse woodland bird community including breeding wood warbler, spotted flycatcher, pied flycatcher, dipper and crossbill, nightjar, redstart and tree pipit.

Attributes of a diverse bird community

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
Diverse breeding bird assemblage	≥ 30 native species of bird nesting on the reserve on an annual basis, including willow warbler, coal tit, wren, chaffinch and robin.	MacKinnon List Survey
Crossbill	Crossbill present on the reserve during the period covered by this management plan.	Bird records
Breeding wood warbler	≥ 3 pairs of wood warbler breeding on the reserve.	MacKinnon List Survey Incidental monitoring by reserve manager
Breeding spotted flycatcher	Spotted flycatcher present on the reserve during the breeding season.*	MacKinnon List Survey
Breeding pied flycatcher	Pied flycatcher present on the reserve during the breeding season.*	MacKinnon List Survey
Breeding dipper	Dipper present on the reserve during the breeding season.*	MacKinnon List Survey
Breeding nightjar	≥ 2 pairs of nightjar regularly breeding on the reserve.	Nightjar territory monitoring
Redstart	Redstart present on the reserve during the breeding season.*	MacKinnon List Survey
Breeding tree pipit	Tree pipit present on the reserve during the breeding season.*	MacKinnon List Survey

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
Suitable habitat heathland	12 ha of heathland in cpts 590 a, o and p <3 ha of dense bracken in heathland mosaic 10-20% heathland areas to contain mature heather 1% of heathland area to contain small (1-2m ²)gaps in the heather > 10 trees per hectare of heathland	Remote sensing
Suitable habitat woodland	As per Feature 1. Broadleaved Woodland	

*PI minimum acceptable frequency of recording to be determined after 3 MacKinnon list surveys carried out.

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.

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Woodland canopy species composition.	The woodland's current canopy composition, in particular, its mixture of broadleaved and coniferous species, allow all the species given above to breed on the reserve. Onward management to increase the proportion of broadleaved species in the canopy, whilst retaining mature conifers, will benefit the majority of species.	Yes	Cross reference w those for Feature 1 above	Woodland Condition Monitoring

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Woodland structure	A well-structured woodland containing trees of each age class, standing dead wood, a well-developed but not uniformly dense understory and network of glades and open areas is necessary to support a diverse bird assemblage, with each species having its own particular set of requirements.	Yes	Cross reference w those for Feature 1 above	Woodland Condition Monitoring
Invasive native species (holly)	This native species is spreading across the woodlands of Wyming Brook. Without control holly forms dense thickets, which are utilized by some species for shelter and nesting but make the understory to dense for others.	Yes	Cross reference w those for Feature 1 above	Woodland Condition Monitoring
Structure of woodland edge habitat	A well-structured woodland edge containing occasional large trees, a scalloped edge, with open areas and areas of younger trees and scrub is necessary to support redstart and tree pipit. Further work (and time) is required to optimize the woodland fringe for these species.	Yes	Width of woodland edge habitat should be at least 1.5 times the height of the nearest mature tree along reserve's woodland/moorland fringe. Average of 3 different tree size classes present per 100m along woodland edge.* Scalloped woodland edge along woodland and moorland fringe. Availability of redstart nest boxes reserve's woodland fringe.	Woodland Condition Monitoring

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Scrub encroachment on heathland	Without management, heathland will succeed to woodland over time. Species such as nightjar and tree pipit require open heathland, with a high dwarf shrub/acid grassland component and low bracken and scrub component in order to breed.	Yes	Presence of 12 ha open heath on the reserve.	Bird survey
Regional, national or international decreases in population size for individual species	The bird species found at Wyming Brook constitute a sub-set of a wider population and may therefore be indirectly affected by population changes on a national or international level. This is particularly true of species on the current red or amber lists which are already undergoing population declines.	Monitor	Local and national populations of individual species remain stable or increase.	BTO published data SBSG published data showing species trends
Disturbance	Visitor numbers are increasing at Wyming Brook, with this increase set to continue as population levels in the city rise. Increases in the popularity of certain activities, such as mountain biking and commercial dog walking are increasing the extent and amount of disturbance experienced by wildlife on the reserve, with ground nesting birds being particularly badly affected.	Monitor	No increase in the amount of footpaths or bridleways on the reserve. No increase in the number of desire lines on the reserve.	Informal monitoring through Wildlife Trust patrols

* Very mature/veteran (at least 80cm DBH) Mature/ mid-range (at least 35cm DBH) Young / Pole stage (at least 7cm DBH) Saplings (Over 50cm, under 7cm DBH) Seedlings (up to 50cm)

Evaluation of current condition

Currently, Wyming Brook's bird assemblage is of special importance, the western part of the reserve being notified as a Site of Special Scientific Interest and Special Protected Area for this reason.

Two bird communities can be identified on the reserve: a woodland bird community and the birds of the moorland fringe, broadly reflecting the habitats and accompanying ecological niches available in the area. While several of the species recorded are of conservation concern, none has conservation management needs that go beyond the management of their habitat(s) outlined elsewhere in this report. Current management activities such as bracken control, retaining veteran trees and both fallen and standing deadwood will benefit bird populations.

Much of the reserve's importance for birds lies in the diversity of the age and structure of its woodland, and the community it supports is typical for an area of upland woodland of this size. The maturity of the trees favour many of the woodland birds, who utilise natural cavities for nesting. The large number of mature conifers adds additional interest, attracting species such as crossbill, and firecrest. However, wintering bird surveys have shown that the majority of species favour the areas of mixed woodland or upland oak wood over mature conifer stands. **Continued diversity in tree age, woodland structure and species composition will therefore be promoted on the reserve in the long-term. Compartment specific management will be carried out to support particular species.**

Nest boxes can be used to encourage certain bird species to breed, where natural nesting features, such as knotholes, are absent or restricted. 50 nest boxes are present on Wyming Brook at the time of writing. However, take up of these by pied flycatcher is limited, possibly because the boxes are utilized by tits and other hole-nesting species, which begin their breeding season before the migrant pied flycatchers arrive. Programmes of **early blocking of nest boxes** have shown to be beneficial for pied flycatcher **and will be undertaken** over the period covered by this management plan. Additionally, **nest boxes for spotted flycatcher and redstart will be installed on the reserve** to increase the number of nest sites available for these species.

The reserve has the potential to support several species of breeding raptor. **Where raptors are known to favour certain trees as nesting sites these will be identified and retained during forestry operations.**

The management of woodland fringe is of particular importance to birds such as tree pipit, spotted flycatcher and redstart. Successional processes mean that the woodland fringe will continue to mature and encroach onto the surrounding moorland without management. **This encroachment will be halted and the area managed to maintain a graduated edge between the moorland and the woodland. Work will be carried out to increase the proportion of suitable fringe habitat on the reserve.**

Nightjar and meadow pipit require open heathland, with a high dwarf shrub component and low bracken and scrub component in order to breed. It is estimated that each pair of Nightjar require 10 ha of suitable habitat to support a brood (however it should be noted that the 10 ha can include contiguous areas in suitable condition but under different ownership). **Compartment specific management will be carried out to support this species.**

Management Objectives

2.0 Reserve supports a diverse woodland bird community including breeding wood warbler, spotted flycatcher, pied flycatcher, dipper and crossbill, nightjar, redstart and tree pipit.

Cross reference with objectives 1.1-1.5.

2.1 To carry out compartment-specific woodland management operations in cpts 589, 590 and 588 to benefit dipper, wood warbler and redstart.

2.2 To retain 12 ha of heathland in favourable condition in cpt 590o to benefit nightjar.

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: REDACTED.

3.5 Feature 4: Microchiropteran (bat) community.

Reserve supports a diverse microchiropteran community.

Attributes of a diverse microchiropteran community

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
Diverse range of bat species live or feed on the reserve.	≥ 6 native species of bat can be recorded on the reserve, including Brant’s bat, whiskered bat, common pipistrelle, soprano pipistrelle and brown long-eared bat.	In conjunction with South Yorkshire Bat Group

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.

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Woodland canopy species composition.	The woodland’s current canopy composition, in particular, its mixture of broadleaved and coniferous species, allow all the species given above to use the reserve. Onward management to increase the proportion of broadleaved species in the canopy, whilst retaining mature conifers, will benefit bat species.	Yes	Cross reference w those for Feature 1 above	Woodland Condition Monitoring

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Woodland structure	A well-structured woodland containing trees of each age class, standing dead wood, a well-developed but not uniformly dense understory and network of glades and open areas is necessary to support a diverse microchiropteran assemblage, with each species having its own particular set of requirements.	Yes	Cross reference w those for Feature 1 above	Woodland Condition Monitoring
Woodland operations	Bats utilize cracks, knotholes and rot holes in trees as summer or hibernation roosts and are therefore at risk of death, injury or disturbance during felling operations.	Yes	Woodland surveyed in accordance with BS8596 before felling operations begin.	Operational Standards and Techniques checklist Appendix IV

Evaluation of current condition

Survey in 2018 suggests that Wyming Brook reserve may be of regional importance for bats. This importance derives from the habitats present on the reserve, and the variety and extent of the habitats present in its immediate vicinity. The reserve's rocky crags and stone tunnels are also important as potential roost sites and should remain undisturbed.

The species composition and structure of the reserve's woodlands are of prime importance for the reserve's bat population, both as a source of food and shelter. A gradual return to broadleaved woodland in good ecological condition will benefit bats. However care should be taken to ensure the continuity and connectivity of woodland cover during this process to allow these species to fully utilise the reserve's woodland resource. Consequently clear-felling will be largely avoided on the reserve.

In addition to the works outlined in section 3.2 above, it is recommended that bat boxes are erected across the reserve, to counter the loss of potential roost sites through felling. Felling works to be carried out in line with the Operational Standards and Techniques outlined in Appendix III.

Management objectives

4.0 Reserve supports a diverse microchiropteran community.

4.1 Provide artificial roosts across the reserve's woodlands.

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: Public access

Reserve is safe, well-maintained and accessible for people of all ages and physical abilities.

<u>Attribute</u>	<u>Performance Indicator</u>	<u>Monitoring</u>
Path network	4.3 km of footpaths maintained in line with PROW standards. 1.3 km of by way closed to traffic maintained in line with PROW standards <i>and</i> with surfacing suitable for mobility scooters.	Through routine patrols
Car parking	Parking for 15 cars available at Redmires Road entrance.	Through routine patrols
Cleanliness	Reserve has low levels of litter and dog waste. Fly tipping on reserve is rare and cleared promptly.	Through routine patrols
Safety	≥ 90% of visitors feel that the reserve is safe and well-cared for. Reserve retains its Green Flag status.	Visitor survey Green Flag Award assessment
Disabled access	Wyming Brook Drive is accessible to those with limited mobility, both on foot and by mobility scooter.	Through routine patrols

Factors

Factors	Rationale	Management Required (Yes/no/monitor)	Technical Indicator of control	Monitoring
Dogs and dog walking services	Increasing dog ownership and the popularity of the reserve for commercial dog walking are leading 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, and on leads during the bird breeding season. Dog faeces and abandoned bags containing the same are rare on the reserve.	Through routine patrols Visitor survey Monitoring of incident log
Correct use of PRoW network	Problems have been reported on the reserve with mountain bikes and motor bikes using the footpath network. Both can cause erosion of unsurfaced paths and prove a danger to walkers (and, in the case of motor bikes, all other reserve users).	Yes	Motorbikes not reported on the reserve. PRoW footpaths used by walkers only. The different user groups on the reserve treat each other with respect, with low levels of conflict between them.	Through routine patrols Monitoring of incident log Monitoring of incident log
Increasing visitor numbers	Visitor numbers are increasing at Wyming Brook, with this increase set to continue as population levels in the city rise. Without careful management, an uncontrolled rise in visitors to the reserve will not only result in increased disturbance to wildlife, but may destroy the peace, tranquility and sense of “getting away from it all” which visitors value.	Yes	“Peace and tranquility” remain highly valued attributes of the reserve	Visitor survey

Evaluation of current condition

Wyming Brook remains a popular site with members of the public. Visitor numbers are high at weekends, and especially during hot weather when the combination of shade and water make it an attractive destination.

Respondents to the 2018 visitor survey show that the majority of visitors live within a couple of miles of the reserve, but that visitor numbers from further afield are increasing. Most visitors are walkers or dog walkers, but the reserve is also popular with runners, local horse riders and mountain bikers.

The majority of visitors, including those who live nearby, drive to the reserve, with most of these parking in the Redmires Road car park. Consequently, this car park is often filled to capacity at weekends, a problem that is likely to increase as visitor numbers to the area continue to increase. Despite this, there are no plans to increase parking capacity at Wyming Brook, as it is feared that such a move would only serve to further increase visitor numbers to the reserve, to the detriment of both wildlife and the visitor experience. **However, the current car park will be maintained to a high standard so that parking capacity within the current footprint is maximised.** The Trust will also work with partners in the Sheffield Lakeland Landscape Partnership project to identify other, more sustainable areas for parking expansion in the Redmires area.

Levels of visitor satisfaction with the reserve are high. The combination of varied, well maintained paths in a natural setting with a high level of visual attractiveness are what attract people to the reserve, with the opportunity to picnic next to a stream in which children can play being particularly attractive to families. When questioned, the vast majority of visitors expressed a desire for the reserve to “remain unchanged”, with no appetite for increases in infrastructure or visitor facilities expressed. **The reserve has currently been awarded “Green Flag” status and SRWT will strive to maintain this over the course of this management plan.**

Much of the existing access infrastructure at Wyming Brook is associated with the public rights of way network. Maintenance of the bridges across the Wyming and Rivelin Brooks falls under the remit of the AMEY PFI contract. Infrastructure related to the upper portions of Wyming Brook drive remains the responsibility of SRWT, with lower parts of the drive falling under Yorkshire Water’s remit. In recent years, part of the drive’s retaining wall has become undermined and unsafe. This will be repaired during the course of this management plan.

Levels of mobility impairment are increasing in the general population. Improvements in transport (public and private) along with improvements in mobility technology mean that those with limited mobility are no longer unable to reach rural locations. However, the number of rural and semi-rural locations with paths and tracks which are suitable for wheelchairs or mobility scooters are limited, especially in Sheffield where gradients are often steep. At Wyming Brook, steep gradients and rough paths make the majority of the reserve inaccessible to those with impaired mobility. However, Wyming Brook Drive could be accessible to mobility scooters and has a suitable surface and gradient for those with more limited mobility, if it were provisioned with suitable access points and frequent rest points. **Work is therefore needed to open up the drive to mobility scooters,** although this must be done in such a way that egress for motorbikes and quad bikes is not inadvertently created. **The existing footpath network should also be maintained to a high standard to ensure that existing levels of access are not lost. However, this network will not be permitted to expand further,** in order that disturbance to wildlife, and the peace and tranquillity of the site so valued by visitors are not compromised.

Works by Yorkshire Water on adjacent land is resulting in an increase in lorry traffic on Redmires Road. Consequently, local horse riders are facing increased difficulty in safely accessing the reserve by the Redmires Road entrance, due to poor visibility to oncoming traffic. A variety of solutions to this issue have been considered and it has been decided that **lowering the scrub vegetation adjacent to the reserve boundary, to improve sight lines, is the solution that will be adopted.**

Periodic fly tipping is a problem in the reserve’s Redmires Road car park. In order to help counter this, a height barrier to the car park will be installed.

Although levels of conflict between different visitor groups on the reserve are generally low, two such areas have been identified. The first is caused by the occasional presence of motorcycles and mountain bikes on the reserve's footpaths. As well as being illegal, such usage is potentially dangerous to walkers and damaging to the paths themselves and will be discouraged. The second area of conflict relates to the increased use of the reserve by professional dog-walking services. Although not all such use is problematic, the number of negative incidents relating to such usage is increasing. Many of these are the result of the walker being accompanied by a large number of dogs, under poor control, which can then be perceived as (and sometimes are) threatening to other reserve users. Poorly controlled dogs, in all numbers, are also proving an increasing source of disturbance to wildlife on the reserve, and are particularly damaging to the breeding success of low or ground-nesting birds such as wood warbler. **SRWT will work to decrease these conflicts during the course of this plan.**

5.0 Reserve is safe, well-maintained and accessible for people of all ages and physical abilities.

- 3.1 To maintain the Public Rights of Way network in line with national and local standards.
- 3.2 To increase the accessibility of Wyming Brook Drive to those with reduced mobility.
- 3.3 To ensure the reserve is kept clean of litter, and safe for public usage.

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.

4.0 WORK PROGRAMME

It is important to note that items included within the work programme may be aspirational. Completion of the designated tasks is highly dependent on Sheffield & Rotherham Wildlife Trust managing to secure external funding to finance ongoing maintenance, habitat management and access improvements and works may be delayed or brought forward depending on the funding climate.

Feature	Objective no.	Objective with prescriptions	2019	2020	2021	2022	2023	2024	2025	2026	2027
Broadleaved woodland	1.1	To decrease the proportion of conifers in the canopy across 46 ha of the reserve by 2027.									
		Calculate the % conifer cover for each woodland compartment across the reserve	X	X							X
		Thin cpt 588 to decrease % conifers in canopy by 30%. Fell to waste. Mix to favour oak/Scots Pine.	X	X					X		
		Selective fell in cpt 589 to decrease % conifers in canopy by 20%.			X						
		Thin cpt 590a to favour oak and other native broadleaved species.			X						X
		Thin cpt 590c to remove conifers from wet woodland			X						X
		Thin cpt 590d to remove conifers from wet woodland. Fell to waste.			X					X	
		Selective fell in cpt 590e to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.			X						X
		Selective fell in cpt 590f to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.			X						X
		Selective fell in cpt 590g to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.				X					
		Thin out conifers in cpt 590h to favour oak and other native broadleaved species around wet woodland.			X						
		Selective fell in cpt 590i to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.				X					
		Clear fell cpt 590j and leave to regenerate naturally with native broadleaved species.				X					
		Selective fell in cpt 590k to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.				X					
		Selective fell in cpt 590m to decrease % conifers in canopy by 20% and to favour oak and other native broadleaved species.				X					
		Selective fell in cpt 590n to decrease % conifers in canopy by 20% and to favour birch and other native broadleaved species.				X					
	1.2	To provide for the long-term retention of conifers in compartments 590b and I, and compartment 588d.									
		Lightly thin cpt 590b for the long-term retention of conifers. Thin broadleaved species to favour oak.			X						
		Lightly thin cpt 590l for the long-term retention of Scot's pine.				X					
		Plant groups of Scot's pine in cpt 588d, adjacent to the stream	X								
		Aftercare for new Scots pine planting		X	X	X					

Feature	Objective no.	Objective with prescriptions	2019	2020	2021	2022	2023	2024	2025	2026	2027
Broadleaved woodland	1.3	To increase the proportion of woodland edge ecotone in good condition to 70% by 2027.									
		For cpt 588a, thinning works prescribed in 1.1, to include removal of mature conifers along 150m of the reserve boundary.	X	X							
		Following removal of conifer on boundary cpt 588a, plant hawthorn, rowan and elder whips along reserve boundary.		X							
		To coppice scrub along one third of the reserve's boundary with the heath each year, to create and maintain a mixed age-range of scrub and young woodland with a scalloped edge.	X	X	X	X	X	X	X	X	X
		Pollard mature trees immediately adjacent to retaining wall section of Wyming Brook Drive in cpt 588d		X							
		Following pollarding of adjacent to Drive in cpt 588a, plant wych elm, hazel and elder whips to stabilize soils.			X						
		1.4	To prevent the domination of the woodland understory by holly across the reserve.			X					
		To monitor and map the extent of holly cover across the reserve's woodlands using data from the woodland condition assessment monitoring.	X								
		To remove 30% of existing holly cover across cpt 588b (Fox Holes Plantation)	X	X		X		X		X	
	1.5	To retain standing and fallen deadwood across the reserve and to actively recruit veteran trees.									
		Map deadwood resource across the reserve using data from the woodland condition assessment monitoring.	X				X				
		Use data to identify compartments and areas where dead wood is lacking, and target these areas for deadwood creation during forestry works.		X	X	X			X	X	X
		Select, mark and halo thin 10 mature or notable trees on the reserve, to assist their succession to veteran status		X	X	X					
	1.6	To eradicate rhododendron and Indian balsam from the reserve by 2027.									
		To map the distribution of rhododendron and Indian balsam on the reserve using data from the woodland condition assessment monitoring.	X				X				
		Eradicate rhododendron and treat stumps.		X	X						
		Starting at the far western end of the reserve, work downstream to control patches of Indian balsam at a rate of 100m/year.	X	X	X	X	X	X	X	X	X

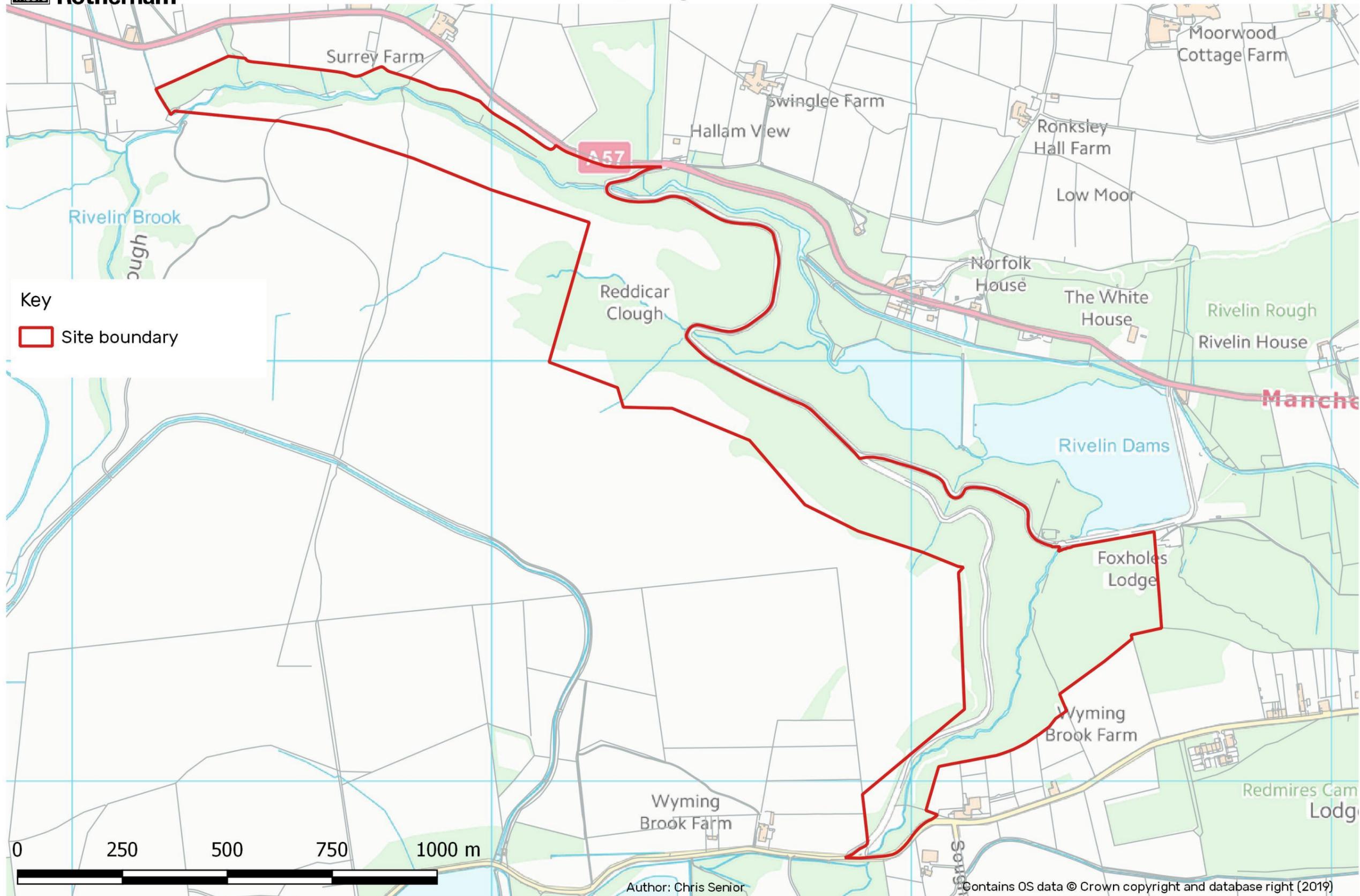
Feature	Objective no.	Objective with prescriptions	2019	2020	2021	2022	2023	2024	2025	2026	2027
Bird Community	2.1	To carry out compartment-specific woodland management operations in cpts 589, 590 and 588 to benefit dipper, wood warbler, pied flycatcher and redstart.									
		Open up 2 x 50m sections of the woodland canopy along each of the Rivelin and Wyming Brooks to benefit dipper .			X	X					
		Select, mark and retain suitable nesting trees for redstart along woodland fringe in cpt 590	X								
		Create 6 areas of sparse understory across cpt 590 to benefit wood warbler			X	X					
		Install 10 nest boxes suitable for redstart along woodland edge.		X							
		Install 10 nest boxes suitable for spotted flycatcher (including nest box cameras) within woodland.						X			
		Undertake early blocking programme for pied flycatcher nest boxes across woodland to encourage uptake		X	X	X	X	X	X	X	X
	2.2	To retain 12 ha of heathland in favourable condition in cpt 590o to benefit nightjar.									
		Remove scrub and young trees from woodland fringe in cpt 590o to retain 12 ha open heathland	X	X	X	X	X	X	X	X	X
		Reduce area of continuous bracken cover in cpt 590o to <3ha by 2027					X	X	X	X	X
		Cut a network of channels and glades into most mature heather in cpt 590o so that 1% of heathland area contains small (1-2m2)gaps in the heather s			X			X			X
Redacted	3.1										
Microchiroptera	4.1	Provide artificial roosts across the reserve's woodlands									
		<i>Cross ref w 1.1-1.5 above</i>									
		Install 30 bat boxes across woodland		X							
Public Access	5.1	To maintain the Public Rights of Way network in line with national and local standards (Figure 11).									
		To install a flight of sleeper steps on the footpath leading north from the Redmires Road car park		X							
		To replace the flight of sleeper steps along the path leading from Wyming Brook Drive to the Wyming Brook			X						
		To repair the subsidence on the retaining wall along Wyming Brook Drive	X								

		Objective with prescriptions	2019	2020	2021	2022	2023	2024	2025	2026	2027
Public Access	5.2	To increase the accessibility of Wyming Brook Drive to those with reduced mobility									
		Replace the 2 benches adjacent to the Wyming Brook	X								
		To install an additional bench along Wyming Brook Drive							X		
		To replace the A-frames at the eastern and southern entrances to Wyming Brook Drive with K frames or radar gates		X							
		Resurface Redmires Road car park				X					
		Improve sight lines along Redmires Road in vicinity of entrance by coppicing young woodland	X	X	X						X
		Install Kent carriage hop at entrance to Redmires Road car park	X								
	5.3	To ensure the reserve is kept clean of litter, and safe for public usage.									
		Mow the grassy area adjacent to the car park 3 times annually	X	X	X	X	X	X	X	X	X
		Carry out regular litter picks across reserve	X	X	X	X	X	X	X	X	X
		Enter reserve for Green Flag award	X	X	X	X	X	X	X	X	X
		Work w SCC and other partner organisations, the reserve advisory group and the kennel club to draw up a code of conduct for dog walking on the reserve.	X								
		Install fencing squeeze across neck of reserve at Redmires Rd car park to exclude motorbikes from boundary footpath.		X							
		Install height control access barrier at entrance to Redmires Road car park	X								

5.0 FIGURES

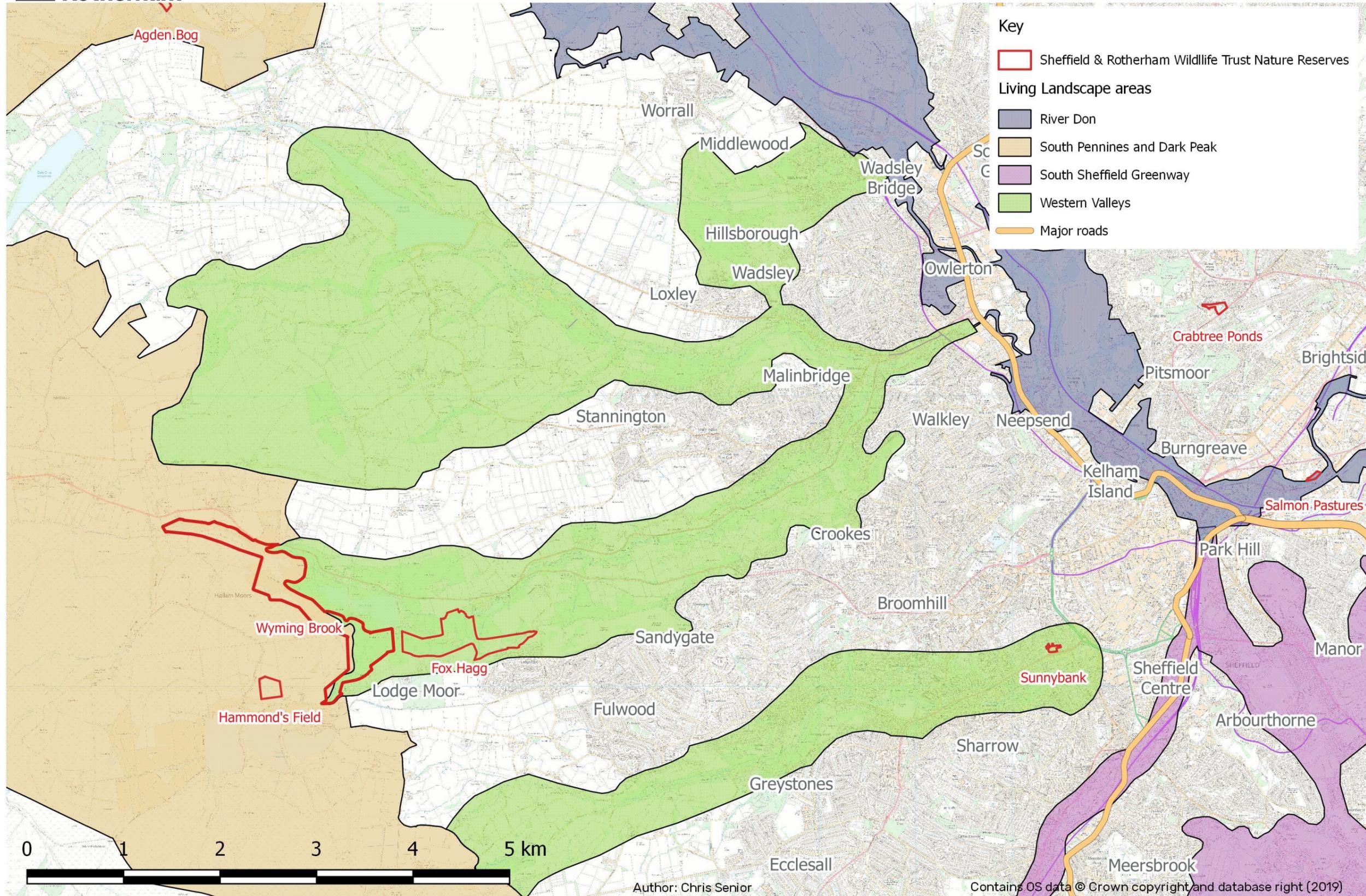
Wyming Brook

Figure 1: Site location & boundary



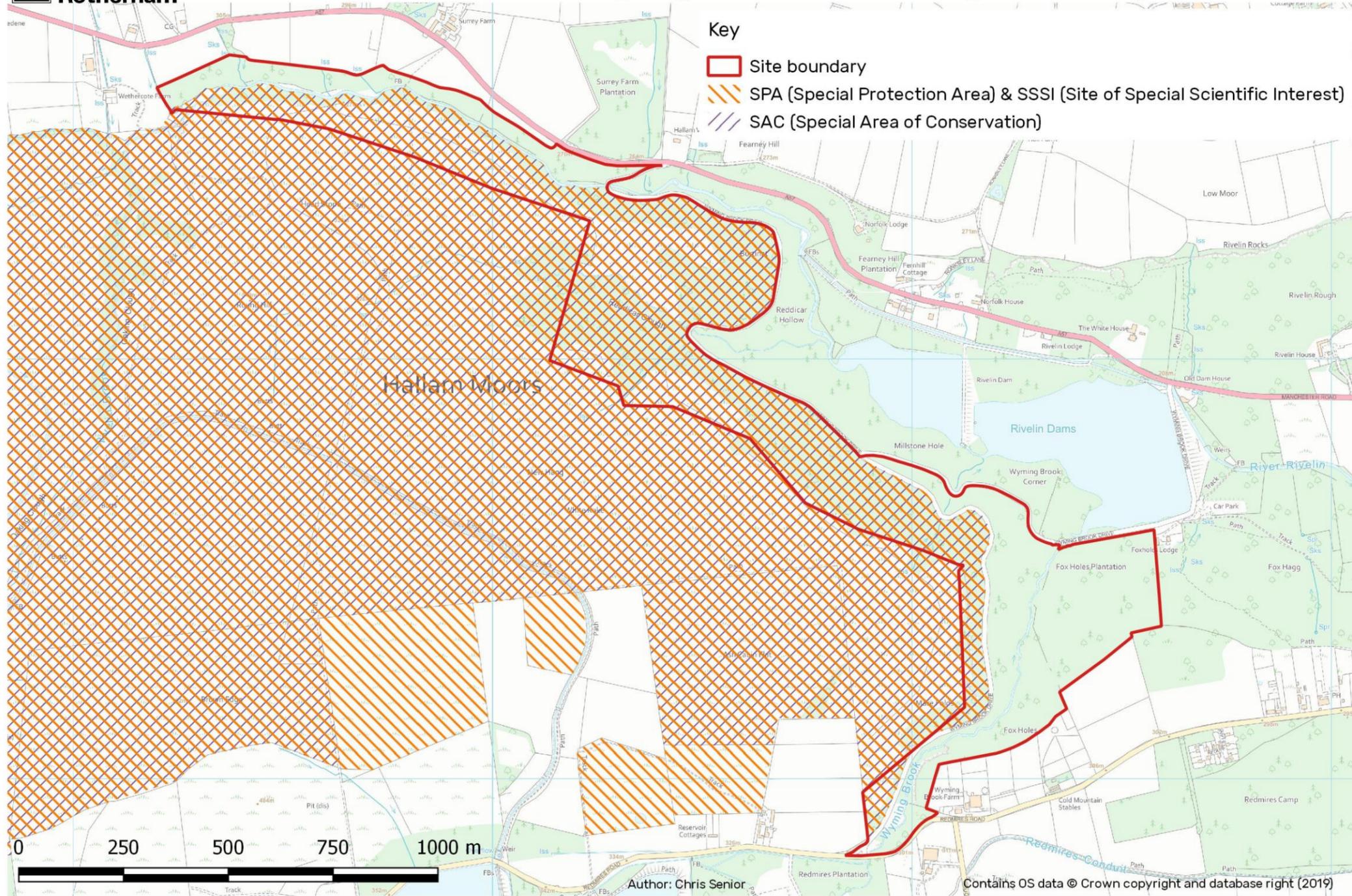
Wyming Brook

Figure 2: Wyming Brook in the landscape



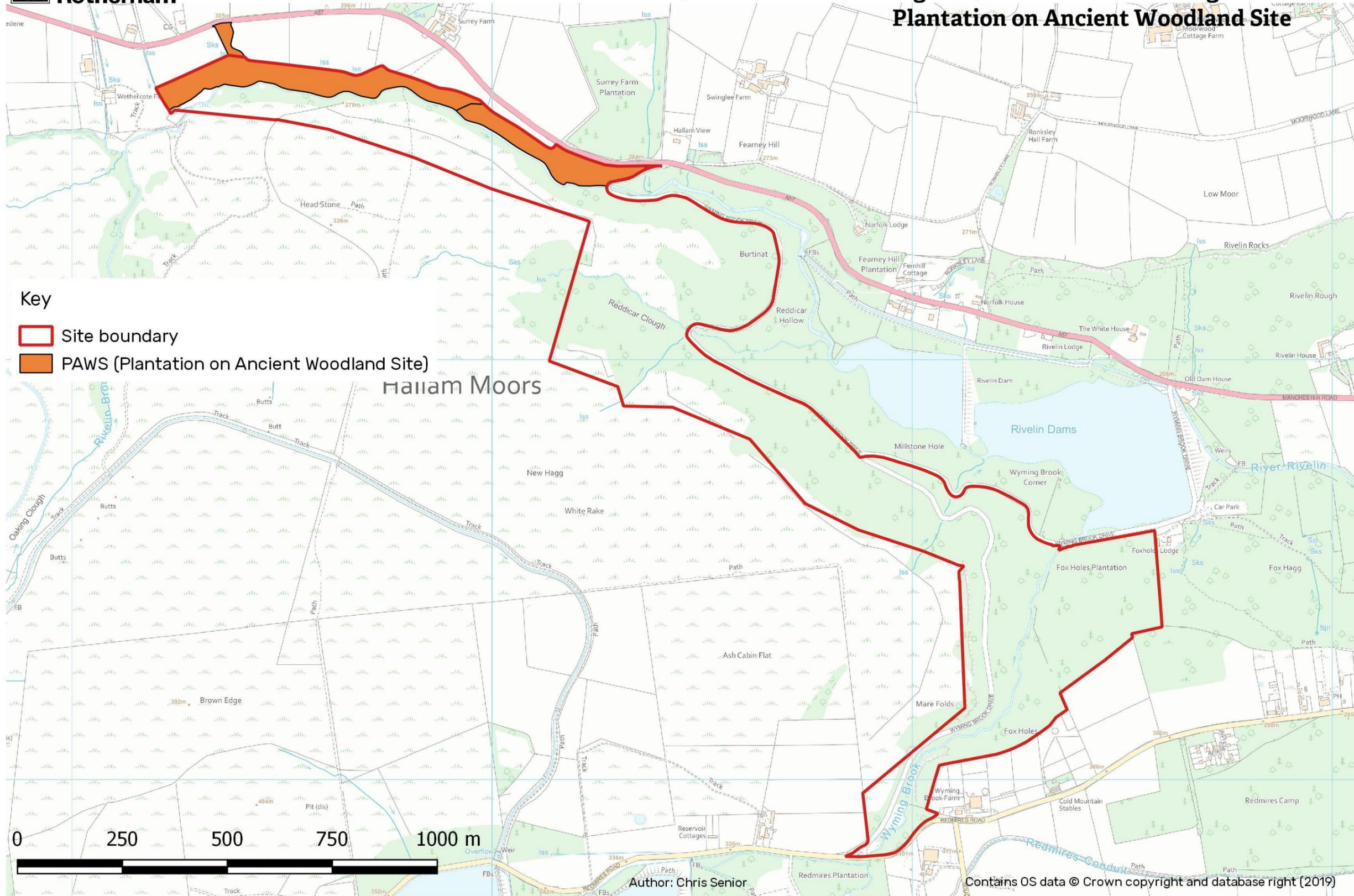
Wyming Brook

Figure 3: Site designations



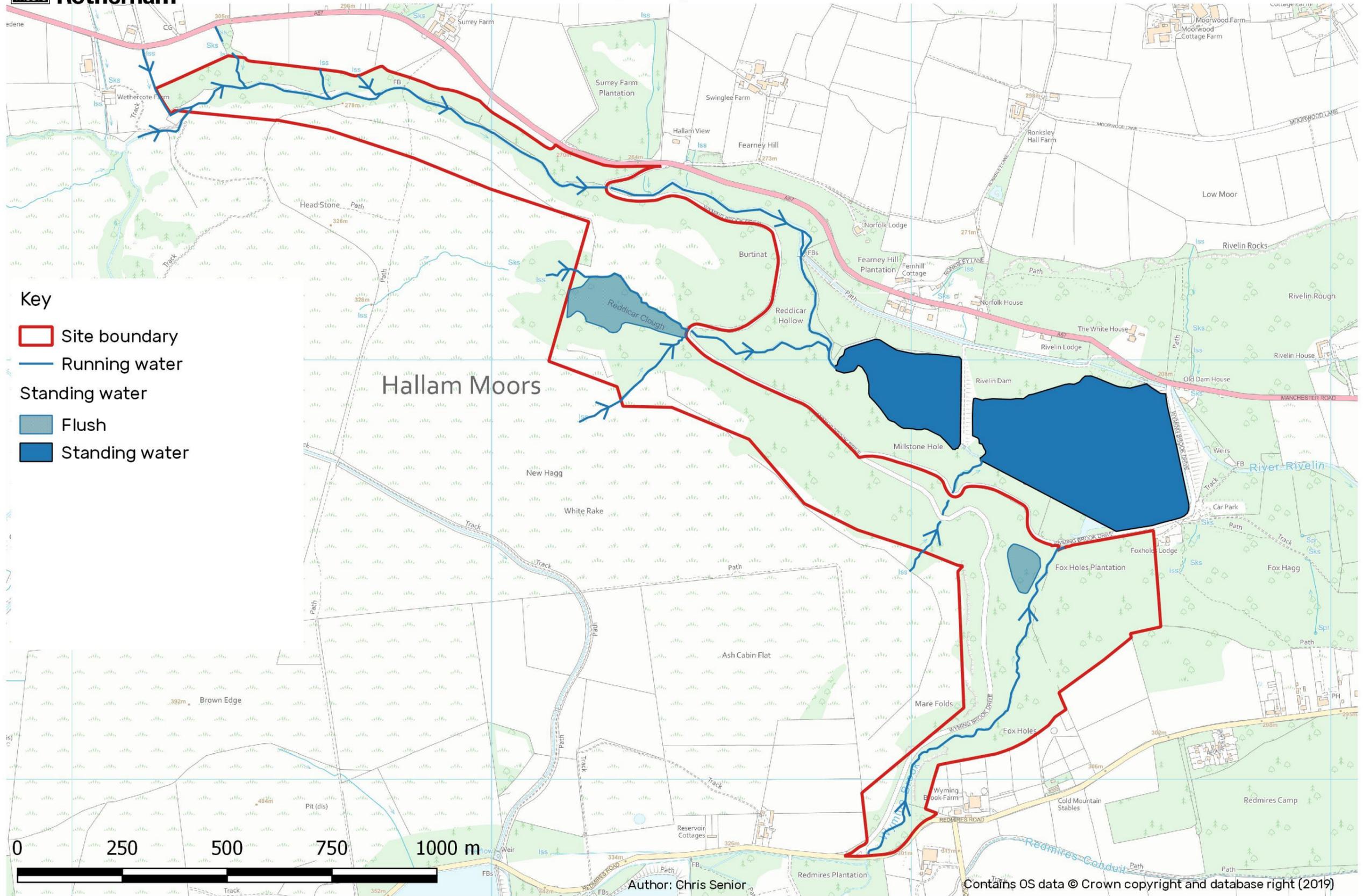
Wyming Brook

Figure 4: Area of reserve designated as Plantation on Ancient Woodland Site



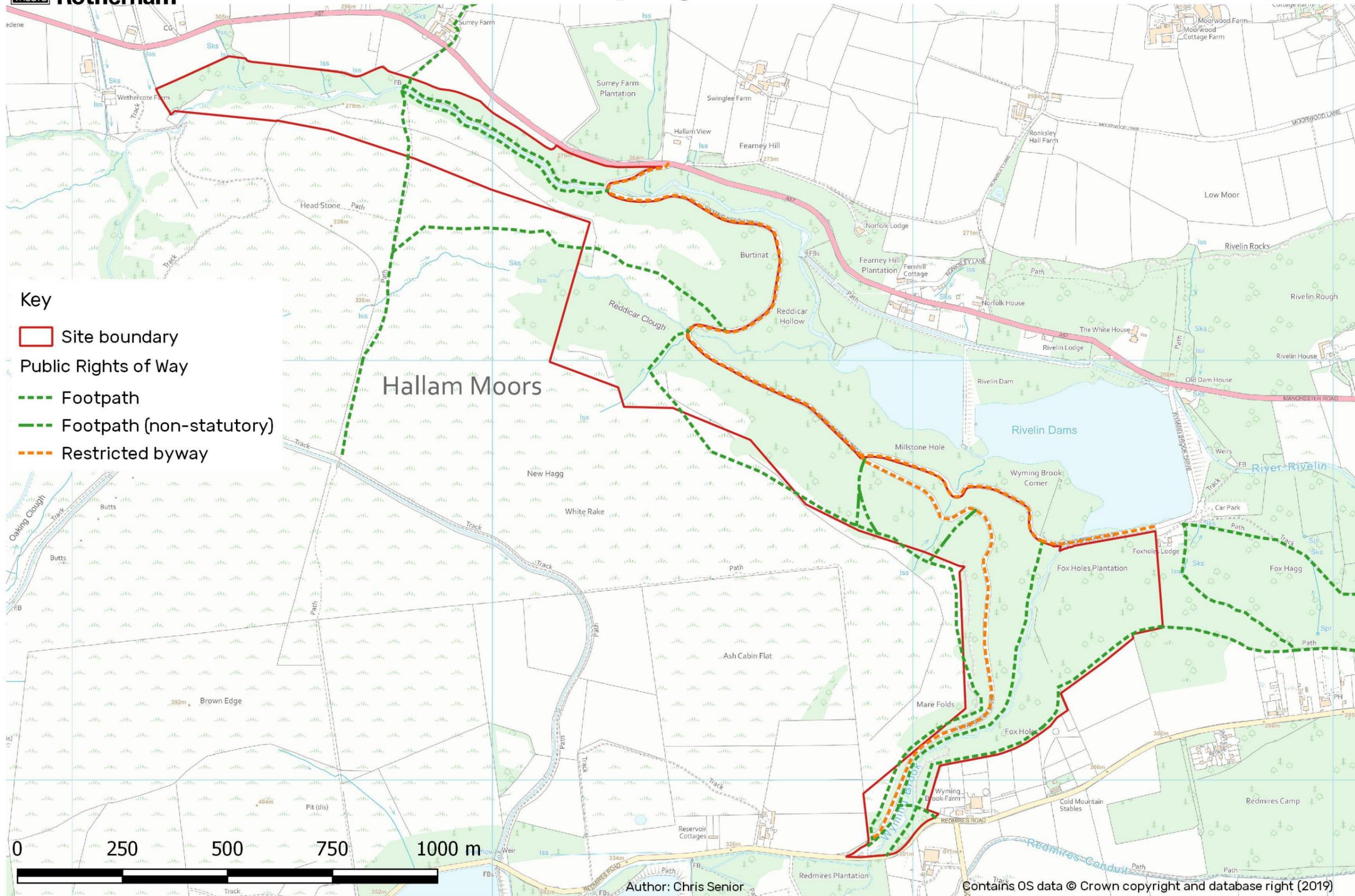
Wyming Brook

Figure 4: Hydrology



Wyming Brook

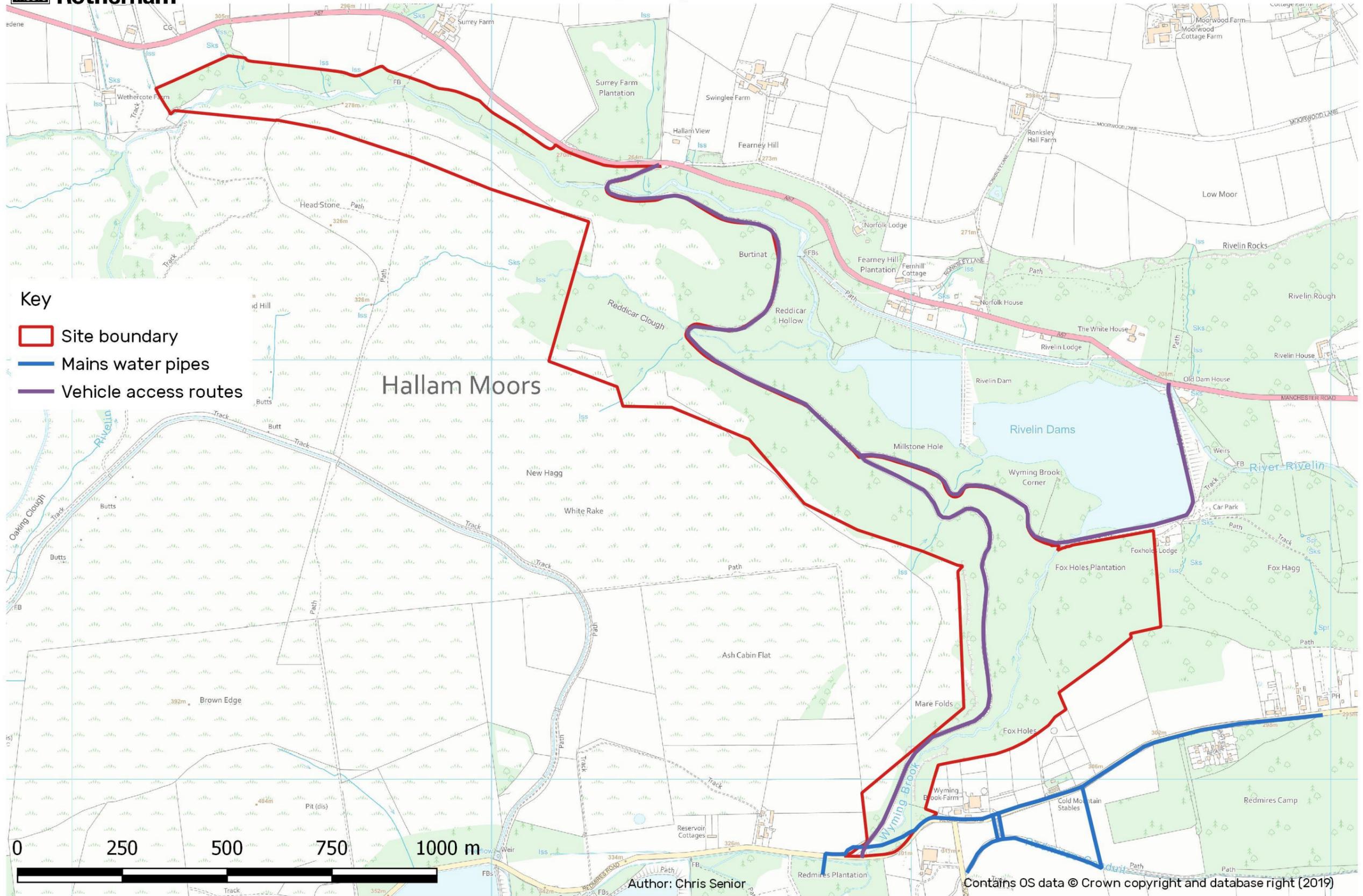
Figure 5: Public Rights of Way



- Key**
- Site boundary
 - Public Rights of Way
 - Footpath
 - Footpath (non-statutory)
 - Restricted byway

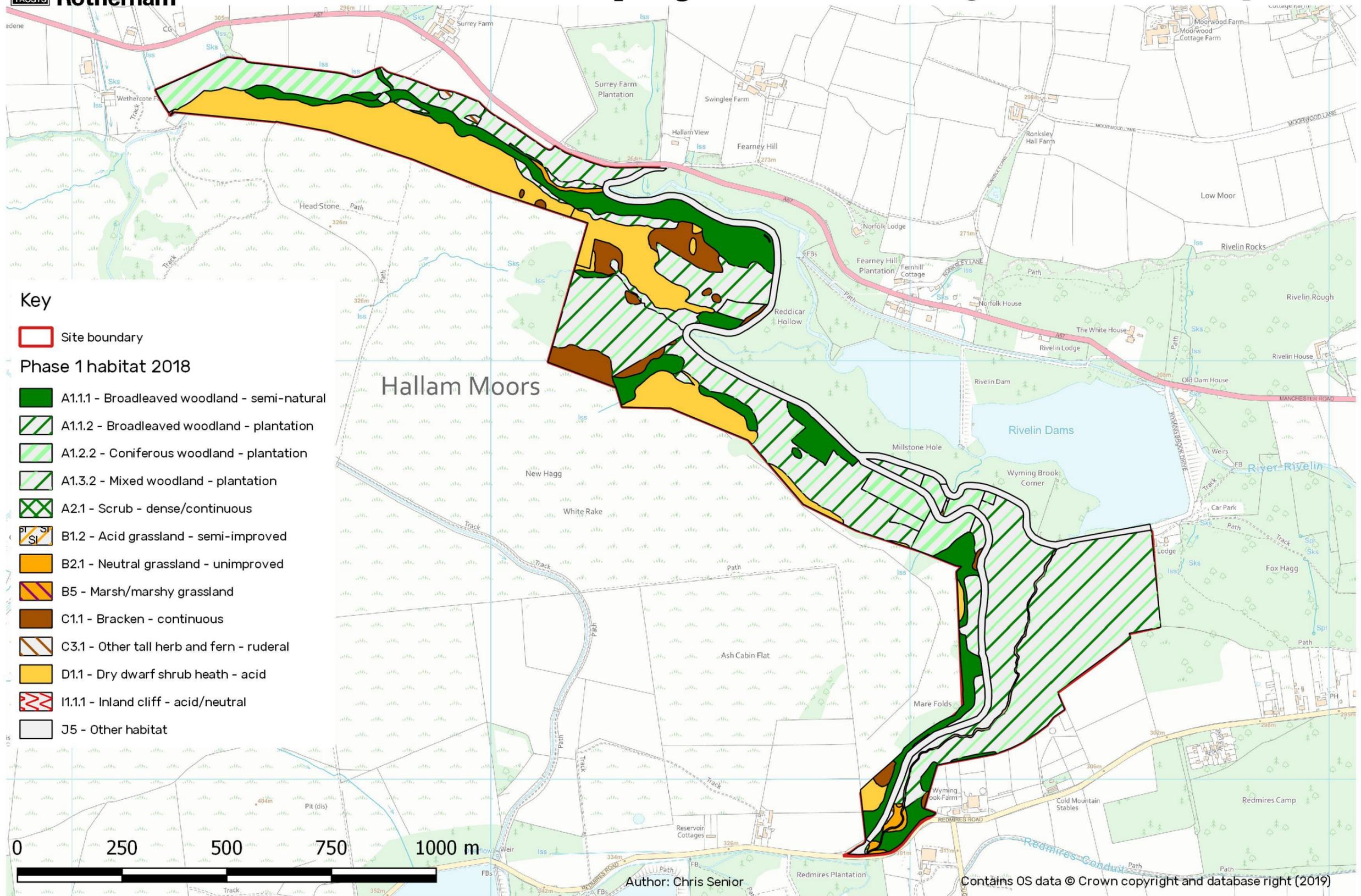
Wyming Brook

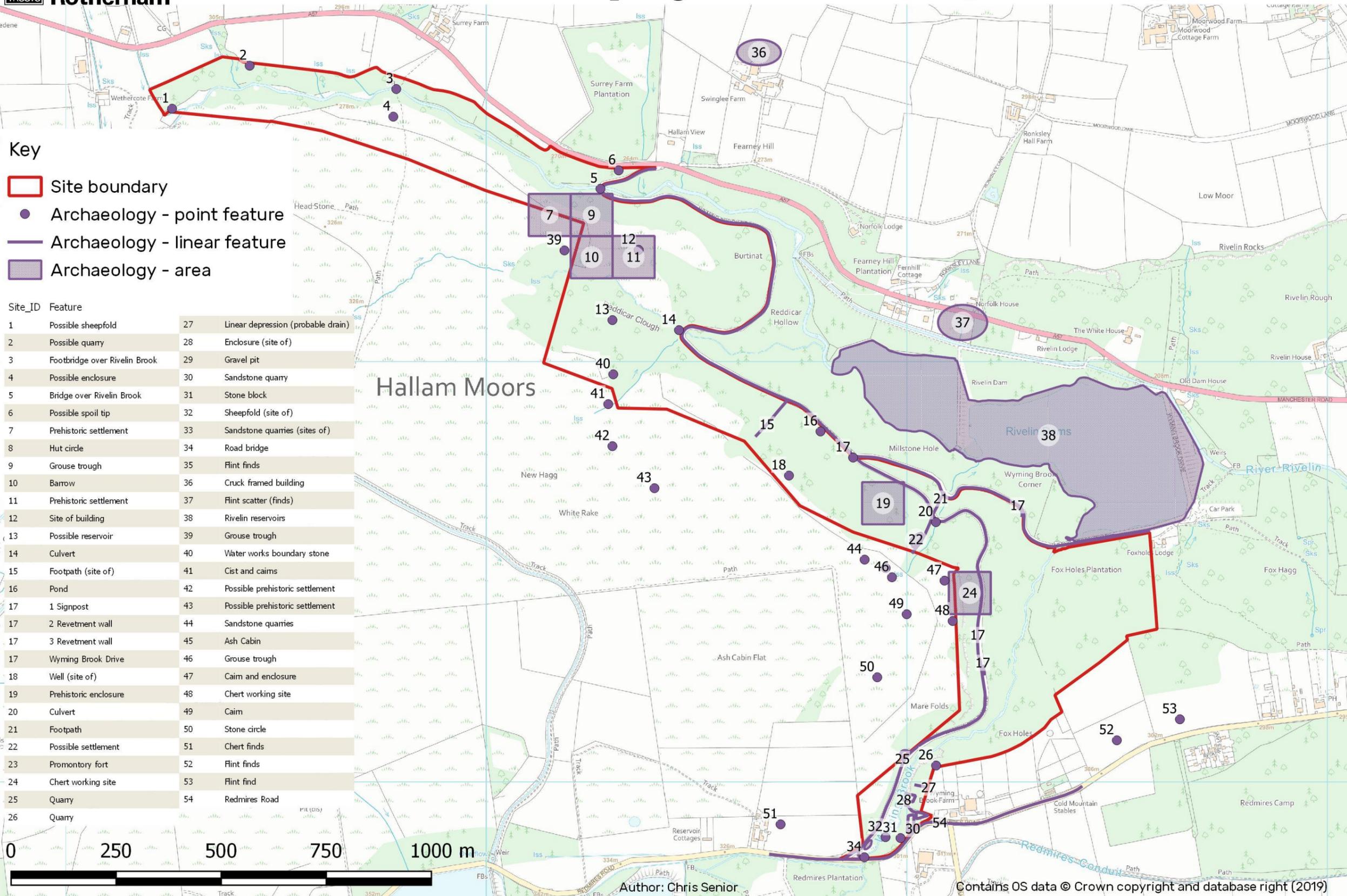
Figure 6: Services & vehicular access



Wyming Brook

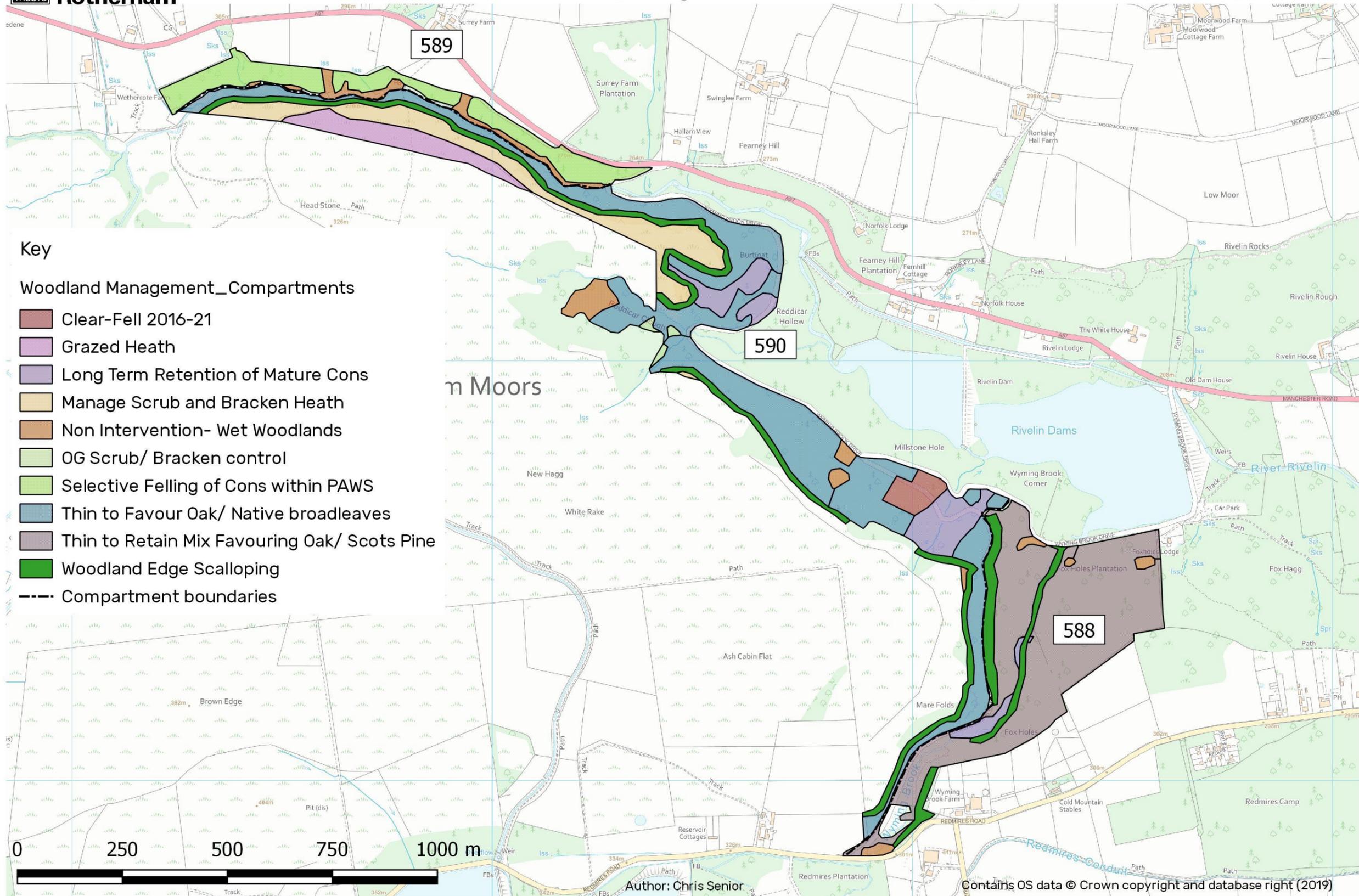
Figure 8: Phase 1 habitat map 2010

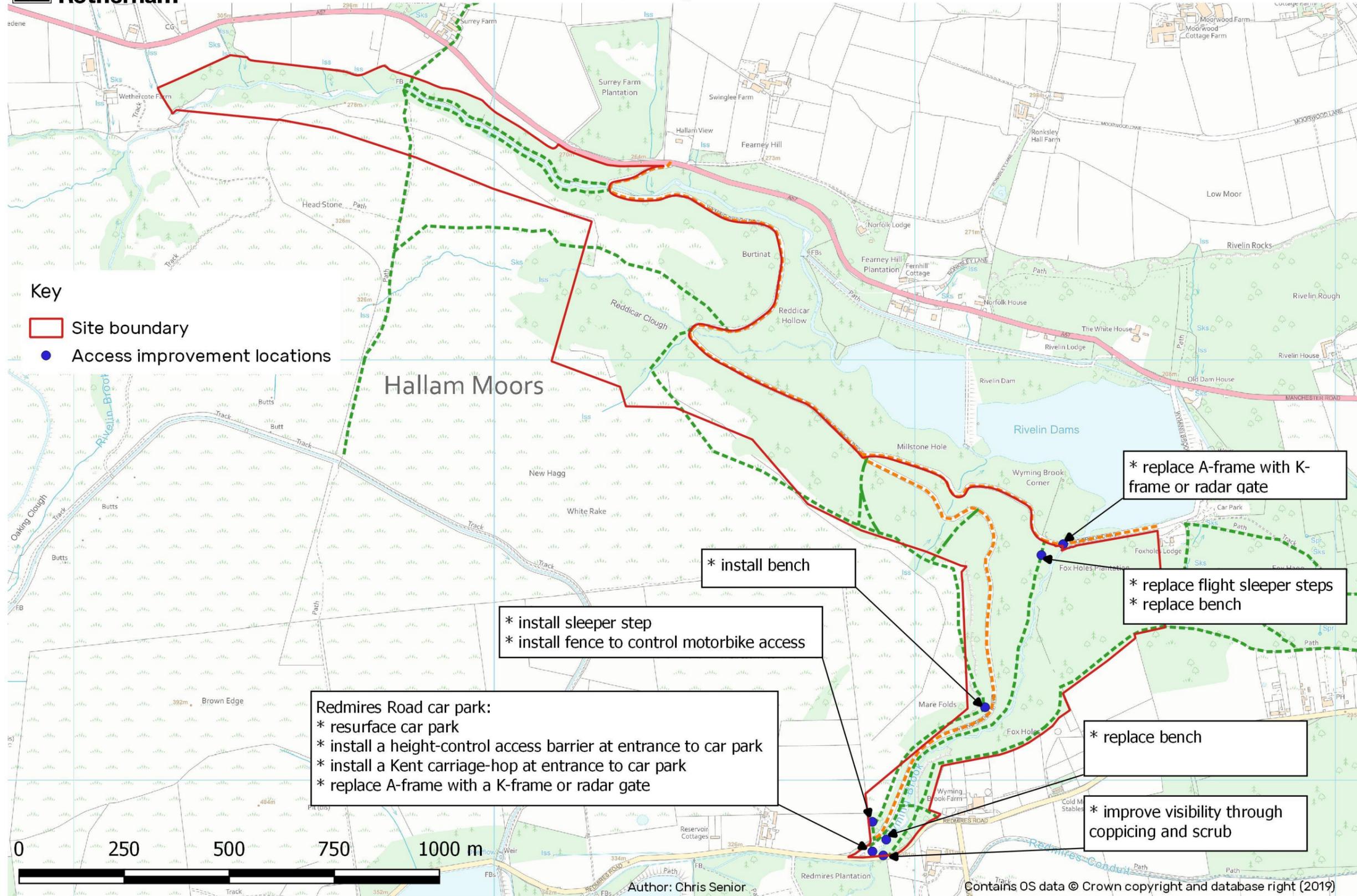




Wyming Brook

Figure 10: Woodland management





APPENDIX I: GLOSSARY OF ACRONYMS AND TERMS

Attribute	Measurable quality of a feature, against which its condition will be monitored in order to judge the effectiveness of management.
BAP	Biodiversity Action Plan
CS	Countryside Stewardship
EA	Environment Agency
Factor	Anything that have the potential to influence or change a feature, or which can affect the way in which a feature is managed.
Feature	The most valued elements of the site, for which it is managed.
LBAP	Local Biodiversity Action Plan
PDNPA	Peak District National Park Authority
PDRMG	Peak District Raptor Monitoring Group
PI	Performance Indicator
SAC	Special Area of Conservation
SCC	Sheffield City Council
SPA	Special Protection Area
SRWT	Sheffield and Rotherham Wildlife Trust
SSSI	Site of Special Scientific Interest
Vision	A statement describing the ideal condition of a site, at a given point in the future.
YW	Yorkshire Water

APPENDIX II SUMMARY OF PROPOSED MONITORING

FEATURE	Monitoring Methodology	Frequency
1. Broadleaved woodland	Woodland Condition Assessment Periodic assessment of percentage conifer in canopy	Every 6 years Every 10 years
2. Bird Community	MacKinnon List Survey Incidental monitoring of wood warbler territories by reserve manager Breeding Bird Survey for Nightjar	Every 3 years Annually Every 3 years
3. Redacted		
4. Microchiroptera	Survey and harp trapping	In conjunction with Sheffield Bat Group
5. Public Access	Through routine patrols Visitor survey Green Flag Award assessment	Monthly Every 5 years Annual

APPENDIX III: OPERATIONAL STANDARDS AND TECHNIQUES

Protection and control

All clear-felling operations will be designed to minimise the risk of damage from wind, fire, pests and diseases through individual coupe sizes not exceeding 5h and the appropriate treatment of waste (lop and top) from thinning and felling operations.

Minimising wind damage

All restructuring will make use of wind firm edges, where available, to minimise the risk of damage from wind. Assessment using the ForestGALES modelling system may be used to further limit the risk from wind damage if required.

Minimising fire risk

A fire plan is in place and is reviewed periodically. Although there are several vehicular access points for local emergency services, most are gated to prevent motorbike and quad bike access. Local emergency services will be issued with a combination lock number. Due to the generally dry ground conditions, age class distribution and the location of the site, the fire risk is moderately high. During periods of high risk (early spring and late summer), restrictions are not put on public access through the wood, as it is accepted that public access leads to better reporting of fire.

Pests and diseases

There are no rabbits present in the woodland. There is a healthy population of grey squirrel and roe deer. Browsing damage will be monitored during Woodland Condition Assessments.

Phytophthora ramorum (and a similar but distantly related disease *Phytophthora kernoviae*) is a fungus-like water mould first recorded in the UK in 2002. Since 2009 *Phytophthora ramorum* has been affecting Japanese Larch in the west of England, and can be hosted by European and hybrid larch. The affected foliage is visible as wilted, withered shoot tips with blackened needles which are shed prematurely. Trees with branch dieback may have numerous cankers on their branches and upper trunk that can bleed resin. In some cases the FC has enforced the felling of infected stands to control the spread of the disease. Rhododendron exhibits wilting and dieback to the same disease and acts as an indicator to its presence and Douglas Fir, Sitka spruce, beech and sweet chestnut can also be infected.

The Common Leaf Weevil *Phyllobius pomaceus* and *P. argentatus* may attack broadleaved restock sites during early May and June. A site, approximately 6km to the south, owned by Sheffield City Council was decimated by the insect in 2005, necessitating an additional 4,000 beat ups. The insect requires adjacent grassland during the larval stages and little can be done to prevent the attacks without the use of insecticides.

During future restocking of pine sites there is a small risk of infestation by of *Hylobius abietis*. Suspected incidents will be reported to the Forestry Commission and also managers of neighbouring forests. Restocking may be delayed by two planting seasons to allow the weevil to complete its life cycle and move on.

Chalara (ash dieback) is a windborne disease of ash trees that is now widespread throughout Sheffield. Ash are not common at Wyming Brook but it is anticipated that all ash trees on the reserve will be lost to this disease during the course of this management plan.

Tree health will be monitored through an annual inspection by the forest manager and the results recorded. Where necessary, foliar samples, etc, may be sent to Forest Research for analysis. Monitoring for other more serious insect pests will be done during harvesting operations.

Biosecurity

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

Archaeology

Features on the area known as Burtinat, and a second concentration of prehistoric sites on Ash Cabin Flat, on the western edge of the reserve, will be marked and protected if heavy machinery is to be used in the area.

Protected species

All forestry operations will be carried out between end August and end January to avoid disturbance to breeding birds.

Where raptors are known to favour certain trees as nesting sites these will be identified and retained during forestry operations.

The reserve is considered to offer high suitability for roosting bats to be present. The trees on site are likely to contain various roosts types, likewise, the site rocky outcrops and man-made features such as tunnels offer suitable habitat for hibernating bats.

No felling works should be carried out until a ground based/aerial PRF (potential roost feature) assessment has been undertaken and the risk to roosting bats managed by an appropriate risk assessment (eg. BS8596).

Any roosts identified will be protected.

Veteran and Notable Trees

Trees identified as veteran or notable during the 2016 survey will be marked and retained during forestry operations.

Water Management

The natural and man-made watercourses/features can be seen in Figure 7. Planning for operations in the vicinity of water features is in accordance with the Forestry Commission (UKFS) Forest and Water Guidelines (<https://www.confor.org.uk/media/246145/forest-and-water-guidelines.pdf>).

The following UKFS buffer widths apply at Wyming Brook from forest edge to watercourse/body:

Buffer Width	Situation
10m	Along permanent watercourses with a channel less than 2m wide.

20m	Along watercourses with a channel more than 2m wide and along the edge of large ponds.
-----	--

The largest stream in Wyming Brook Nature Reserve is the Rivelin Brook at around 2-3m wide.

All water features within the vicinity of harvest operations will be highlighted within the Hazard Assessment with regard to fuel storage and possible spillage. Only minimal intervention of forest operations will take place within the above to further reduce any impact of soil erosion, sedimentation and harvest pollution.

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

There are no plans to use fertilizers or herbicides within the above buffer areas.

Domestic stock and fencing

The condition of boundary fences and walls will be inspected annually. 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 exclusion of stock. There have been no incidents of stock incursion during the last eight years.

Use of pesticides and fertilisers

The range of pesticide use on the reserve has been kept to a minimum, with only two chemicals, glyphosate and asulox, in use since at least 2000. No fertiliser has been applied.

Work will be carried out 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.

COSHH assessments and completed pesticide reports are held on file for the woodland.

All pesticide applications will be carried out in accordance with Forestry Commission Field Book 8 - The Use of Herbicides in the Forest. All operators will be competent to apply pesticides. Warning signs will be erected on treated sites and site visitors informed of the operations in advance.

Pesticide report forms are completed on a daily basis by operators and held on file.

Assessments will be made as to whether pesticide treatments are required. An environmental appraisal will be carried out to select methods of application that minimise the risk of detrimental effects of pesticides and fertilisers.

Waste disposal and pollution

No significant waste from forest operations has been identified.

The Environment Agency and SCC Environmental Enforcement Officer will be informed of all illegal activities as appropriate. The dumping of oil drums, car batteries and asbestos has previously been an issue at Redmires Road. These will continue to be removed by a specialised disposal service including the issue of a removal certificate.

Fly-tipped waste and garden refuse 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 in the woodland, see section Emergency Procedures below.

Control of harvesting operations

Varied ground conditions and silvicultural treatments require a range of harvesting methods. Conifer operations in more accessible areas can be completed with mechanised harvesters and forwarders. Broadleaved and steeper areas mostly require felling by chainsaw, either to waste or for extraction by forwarders.

Most of the woodland will be thinned by both line and selective thinning. Control of the thinning yields will be undertaken through sample marking and management tables from appropriate yield models. Records of thinning yields will be maintained to help with future monitoring.

Stands that are designated to be treated under CCF systems will be thinned on a more selective basis, in order to enable regeneration. It is anticipated that later thinning operations during the stand re-initiation stage will be fully marked in order to ensure a sustainable cut from each management unit.

The presumption in the plan is that all timber will be sold on a standing sale basis. The buyer of the standing timber will be selected not only for the price offered for the timber, but also for their quality of work and safe working practices.

Harvesting operations will be limited to periods outside of bird nesting times when the ground conditions are suitable to support, without significant damage, the machinery and level of activity expected for the operation. Harvesting sites will be organised and will employ the use of brash mats.

Emergency procedures

Chemical and oil spill

A chemical and oil spill emergency plan will be in place for all operations. Where a third party is taking the responsibility of Forest Works Manager (FWM), such as in a standing sale, they will be required to have a robust procedure in place.

Fire plan

See above.

Accident plan

All harvesting operations will have a harvesting plan 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. The forest manager and/or SRWT personnel will attend as quickly as possible when an accident or injury occurs, unless very minor.

Road, track and ride maintenance

Wyming Brook Drive, the only vehicular track on the reserve, acts as a PRoW and special care is required, especially following harvesting, to ensure there is no hazard to the public.

Routine side drain and culvert road maintenance will be carried out during periods of dry weather to avoid run-off. Post harvesting maintenance will be required to be completed soon after harvesting so as to avoid ponding in wheel ruts and run off of suspended solids.

Management of health and safety

The management of health and safety underpins all operational activities. A framework of responsibility as set out in 'Managing Health and Safety in Forestry Operations' (HSE, 1999) will be established in all operations. When standing timber is sold, SRWT will mostly take on the role of the Landowner, with the purchaser taking on the role of Forest Works Manager (FMW).

Vendors and sub-contractors will be selected after being audited for health and safety compliance.

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

APPENDIX IV: OPERATIONAL STANDARDS AND TECHNIQUES CHECKLIST

To be completed before management operations undertaken

	Yes/No/ Applicable	Not
<p>Protection and control</p> <p>Clear-felling operations designed to minimise the risk of damage from wind, fire, pests and disease.</p> <p>Coupe sizes does not exceed 5h</p>		
<p>Wind damage and fire risk</p> <p>Forestry operations designed to make use of wind firm edges, where available</p> <p>Up to date fire risk plan in place for the reserve</p>		
<p>Tree pests and diseases</p> <p>Tree diseases currently active in work area (please list):</p> <p>Appropriate biosecurity measures in place</p>		
<p>Other Protected Species</p> <p>Harvesting operations will be limited to periods outside of bird nesting season</p> <p>Ground conditions suitable to support machinery and level of activity expected for the operation without risk significant damage (Y/N) If no, list mitigations below:</p> <p>All/any raptor nesting sites within operational areas identified and marked for retention.</p> <p>Ground based/aerial PRF bat roost assessment has been undertaken and the risk to roosting bats managed by an appropriate risk assessment.</p>		
<p>Archaeology</p> <p>All/any prehistoric archaeological features excluded from operational areas.</p>		
<p>Veteran and notable trees</p> <p>All/any veteran and notable trees in operational areas identified and marked for retention.</p>		

<p>Water management</p> <p>Buffer areas in place along all watercourses in operational area.</p> <p>All water features within the vicinity of harvest operations highlighted within the Hazard Assessment with regard to fuel storage and possible spillage.</p> <p>Use of fertilizers and pesticides excluded from buffer areas.</p> <p>Procedures and equipment for control of any oil/ fuel spill in the woodland in place.</p>	
<p>Pesticides use</p> <p>Assessments made to determine if pesticide treatment required.</p> <p>If yes:</p> <p>Least harmful pesticide and delivery mechanism selected for use.</p> <p>Necessary COSHH assessments and completed pesticide reports completed and held on file.</p> <p>Copies of competency certificates for all operators on file.</p> <p>Pesticide report forms to be completed on a daily basis by operators and held on file.</p> <p>Warning signage to be erected on treated sites and visitors informed of the operations in advance.</p> <p>Fuel and chemical containers to be removed from the site by operators and disposed of through a licensed tip or a specialist waste disposal contractor.</p> <p>Surplus fuels and chemicals will be returned to the SRWT store before safe disposal in line with environmental requirements.</p> <p>Procedures and equipment for control of any oil or chemical spill in the woodland in place.</p> <p>All pesticide applications to be carried out in accordance with Forestry Commission Field Book 8 - The Use of Herbicides in the Forest and with SRWT pesticide policies and procedures.</p>	
<p>Management of Health and Safety</p> <p>Risk assessment for works has been produced, signed off and placed on file.</p> <p>Chemical and oil spill emergency plan in place.</p> <p>Site fire plan shared with all contractors (if fire risk high)</p> <p>Warning signage agreed and in place. Responsibility for maintenance of signage has been allocated.</p> <p>Contact details for all parties (contract manager, principle contractor, site manager etc) shared and placed on file.</p>	

APPENDIX V: LIST OF SURVEYS, MONITORING PROGRAMMES AND REPORTS

Author	Date	Survey	Summary of surveys at Wyming
Andrea Needham and Lisa Fox	1997	Rivelin/Redmires Parking and Visitor Survey	This is the first traffic and visitor survey in this area, required for nature conservation issues in the area. The road network to the parks (1 at Wyming Brook and 1 just off Redmires roadside).
Chris Falshaw	1999	The Birds of Wyming Brook	A brief report discussing the records of bird life since 1990. As of 1999, the records discussed are incomplete since people tend to record therefore more 'common' species are under-recorded. Over 100 migrants and winter visitors are important at this site and are discussed.
Yorkshire Water Services	1999	Wyming Brook Bryophyte Survey	The report describes the bryophyte assemblage which is part of an evaluation of the ecological value of the bryophyte flora, in relation to increased water flows on the bryophyte assemblages in the stream. Conditions for bryophytes, but diversity is limited by the relative sandstone.
Yorkshire Water Services	1999	Redmires Reservoir Release Trials	The objective of the trial was to demonstrate the effect on Wyming Brook Redmires Reservoir Group, at varying flow rates, for transfer to the Wyming Brook Group. A number of different flow rates were tested: 0, 2, 8, 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63, 68, 73, 78, 83, 88, 93, 98, 103, 108, 113, 118, 123, 128, 133, 138, 143, 148, 153, 158, 163, 168, 173, 178, 183, 188, 193, 198, 203, 208, 213, 218, 223, 228, 233, 238, 243, 248, 253, 258, 263, 268, 273, 278, 283, 288, 293, 298, 303, 308, 313, 318, 323, 328, 333, 338, 343, 348, 353, 358, 363, 368, 373, 378, 383, 388, 393, 398, 403, 408, 413, 418, 423, 428, 433, 438, 443, 448, 453, 458, 463, 468, 473, 478, 483, 488, 493, 498, 503, 508, 513, 518, 523, 528, 533, 538, 543, 548, 553, 558, 563, 568, 573, 578, 583, 588, 593, 598, 603, 608, 613, 618, 623, 628, 633, 638, 643, 648, 653, 658, 663, 668, 673, 678, 683, 688, 693, 698, 703, 708, 713, 718, 723, 728, 733, 738, 743, 748, 753, 758, 763, 768, 773, 778, 783, 788, 793, 798, 803, 808, 813, 818, 823, 828, 833, 838, 843, 848, 853, 858, 863, 868, 873, 878, 883, 888, 893, 898, 903, 908, 913, 918, 923, 928, 933, 938, 943, 948, 953, 958, 963, 968, 973, 978, 983, 988, 993, 998, 1003, 1008, 1013, 1018, 1023, 1028, 1033, 1038, 1043, 1048, 1053, 1058, 1063, 1068, 1073, 1078, 1083, 1088, 1093, 1098, 1103, 1108, 1113, 1118, 1123, 1128, 1133, 1138, 1143, 1148, 1153, 1158, 1163, 1168, 1173, 1178, 1183, 1188, 1193, 1198, 1203, 1208, 1213, 1218, 1223, 1228, 1233, 1238, 1243, 1248, 1253, 1258, 1263, 1268, 1273, 1278, 1283, 1288, 1293, 1298, 1303, 1308, 1313, 1318, 1323, 1328, 1333, 1338, 1343, 1348, 1353, 1358, 1363, 1368, 1373, 1378, 1383, 1388, 1393, 1398, 1403, 1408, 1413, 1418, 1423, 1428, 1433, 1438, 1443, 1448, 1453, 1458, 1463, 1468, 1473, 1478, 1483, 1488, 1493, 1498, 1503, 1508, 1513, 1518, 1523, 1528, 1533, 1538, 1543, 1548, 1553, 1558, 1563, 1568, 1573, 1578, 1583, 1588, 1593, 1598, 1603, 1608, 1613, 1618, 1623, 1628, 1633, 1638, 1643, 1648, 1653, 1658, 1663, 1668, 1673, 1678, 1683, 1688, 1693, 1698, 1703, 1708, 1713, 1718, 1723, 1728, 1733, 1738, 1743, 1748, 1753, 1758, 1763, 1768, 1773, 1778, 1783, 1788, 1793, 1798, 1803, 1808, 1813, 1818, 1823, 1828, 1833, 1838, 1843, 1848, 1853, 1858, 1863, 1868, 1873, 1878, 1883, 1888, 1893, 1898, 1903, 1908, 1913, 1918, 1923, 1928, 1933, 1938, 1943, 1948, 1953, 1958, 1963, 1968, 1973, 1978, 1983, 1988, 1993, 1998, 2003, 2008, 2013, 2018, 2023, 2028, 2033, 2038, 2043, 2048, 2053, 2058, 2063, 2068, 2073, 2078, 2083, 2088, 2093, 2098, 2103, 2108, 2113, 2118, 2123, 2128, 2133, 2138, 2143, 2148, 2153, 2158, 2163, 2168, 2173, 2178, 2183, 2188, 2193, 2198, 2203, 2208, 2213, 2218, 2223, 2228, 2233, 2238, 2243, 2248, 2253, 2258, 2263, 2268, 2273, 2278, 2283, 2288, 2293, 2298, 2303, 2308, 2313, 2318, 2323, 2328, 2333, 2338, 2343, 2348, 2353, 2358, 2363, 2368, 2373, 2378, 2383, 2388, 2393, 2398, 2403, 2408, 2413, 2418, 2423, 2428, 2433, 2438, 2443, 2448, 2453, 2458, 2463, 2468, 2473, 2478, 2483, 2488, 2493, 2498, 2503, 2508, 2513, 2518, 2523, 2528, 2533, 2538, 2543, 2548, 2553, 2558, 2563, 2568, 2573, 2578, 2583, 2588, 2593, 2598, 2603, 2608, 2613, 2618, 2623, 2628, 2633, 2638, 2643, 2648, 2653, 2658, 2663, 2668, 2673, 2678, 2683, 2688, 2693, 2698, 2703, 2708, 2713, 2718, 2723, 2728, 2733, 2738, 2743, 2748, 2753, 2758, 2763, 2768, 2773, 2778, 2783, 2788, 2793, 2798, 2803, 2808, 2813, 2818, 2823, 2828, 2833, 2838, 2843, 2848, 2853, 2858, 2863, 2868, 2873, 2878, 2883, 2888, 2893, 2898, 2903, 2908, 2913, 2918, 2923, 2928, 2933, 2938, 2943, 2948, 2953, 2958, 2963, 2968, 2973, 2978, 2983, 2988, 2993, 2998, 3003, 3008, 3013, 3018, 3023, 3028, 3033, 3038, 3043, 3048, 3053, 3058, 3063, 3068, 3073, 3078, 3083, 3088, 3093, 3098, 3103, 3108, 3113, 3118, 3123, 3128, 3133, 3138, 3143, 3148, 3153, 3158, 3163, 3168, 3173, 3178, 3183, 3188, 3193, 3198, 3203, 3208, 3213, 3218, 3223, 3228, 3233, 3238, 3243, 3248, 3253, 3258, 3263, 3268, 3273, 3278, 3283, 3288, 3293, 3298, 3303, 3308, 3313, 3318, 3323, 3328, 3333, 3338, 3343, 3348, 3353, 3358, 3363, 3368, 3373, 3378, 3383, 3388, 3393, 3398, 3403, 3408, 3413, 3418, 3423, 3428, 3433, 3438, 3443, 3448, 3453, 3458, 3463, 3468, 3473, 3478, 3483, 3488, 3493, 3498, 3503, 3508, 3513, 3518, 3523, 3528, 3533, 3538, 3543, 3548, 3553, 3558, 3563, 3568, 3573, 3578, 3583, 3588, 3593, 3598, 3603, 3608, 3613, 3618, 3623, 3628, 3633, 3638, 3643, 3648, 3653, 3658, 3663, 3668, 3673, 3678, 3683, 3688, 3693, 3698, 3703, 3708, 3713, 3718, 3723, 3728, 3733, 3738, 3743, 3748, 3753, 3758, 3763, 3768, 3773, 3778, 3783, 3788, 3793, 3798, 3803, 3808, 3813, 3818, 3823, 3828, 3833, 3838, 3843, 3848, 3853, 3858, 3863, 3868, 3873, 3878, 3883, 3888, 3893, 3898, 3903, 3908, 3913, 3918, 3923, 3928, 3933, 3938, 3943, 3948, 3953, 3958, 3963, 3968, 3973, 3978, 3983, 3988, 3993, 3998, 4003, 4008, 4013, 4018, 4023, 4028, 4033, 4038, 4043, 4048, 4053, 4058, 4063, 4068, 4073, 4078, 4083, 4088, 4093, 4098, 4103, 4108, 4113, 4118, 4123, 4128, 4133, 4138, 4143, 4148, 4153, 4158, 4163, 4168, 4173, 4178, 4183, 4188, 4193, 4198, 4203, 4208, 4213, 4218, 4223, 4228, 4233, 4238, 4243, 4248, 4253, 4258, 4263, 4268, 4273, 4278, 4283, 4288, 4293, 4298, 4303, 4308, 4313, 4318, 4323, 4328, 4333, 4338, 4343, 4348, 4353, 4358, 4363, 4368, 4373, 4378, 4383, 4388, 4393, 4398, 4403, 4408, 4413, 4418, 4423, 4428, 4433, 4438, 4443, 4448, 4453, 4458, 4463, 4468, 4473, 4478, 4483, 4488, 4493, 4498, 4503, 4508, 4513, 4518, 4523, 4528, 4533, 4538, 4543, 4548, 4553, 4558, 4563, 4568, 4573, 4578, 4583, 4588, 4593, 4598, 4603, 4608, 4613, 4618, 4623, 4628, 4633, 4638, 4643, 4648, 4653, 4658, 4663, 4668, 4673, 4678, 4683, 4688, 4693, 4698, 4703, 4708, 4713, 4718, 4723, 4728, 4733, 4738, 4743, 4748, 4753, 4758, 4763, 4768, 4773, 4778, 4783, 4788, 4793, 4798, 4803, 4808, 4813, 4818, 4823, 4828, 4833, 4838, 4843, 4848, 4853, 4858, 4863, 4868, 4873, 4878, 4883, 4888, 4893, 4898, 4903, 4908, 4913, 4918, 4923, 4928, 4933, 4938, 4943, 4948, 4953, 4958, 4963, 4968, 4973, 4978, 4983, 4988, 4993, 4998, 5003, 5008, 5013, 5018, 5023, 5028, 5033, 5038, 5043, 5048, 5053, 5058, 5063, 5068, 5073, 5078, 5083, 5088, 5093, 5098, 5103, 5108, 5113, 5118, 5123, 5128, 5133, 5138, 5143, 5148, 5153, 5158, 5163, 5168, 5173, 5178, 5183, 5188, 5193, 5198, 5203, 5208, 5213, 5218, 5223, 5228, 5233, 5238, 5243, 5248, 5253, 5258, 5263, 5268, 5273, 5278, 5283, 5288, 5293, 5298, 5303, 5308, 5313, 5318, 5323, 5328, 5333, 5338, 5343, 5348, 5353, 5358, 5363, 5368, 5373, 5378, 5383, 5388, 5393, 5398, 5403, 5408, 5413, 5418, 5423, 5428, 5433, 5438, 5443, 5448, 5453, 5458, 5463, 5468, 5473, 5478, 5483, 5488, 5493, 5498, 5503, 5508, 5513, 5518, 5523, 5528, 5533, 5538, 5543, 5548, 5553, 5558, 5563, 5568, 5573, 5578, 5583, 5588, 5593, 5598, 5603, 5608, 5613, 5618, 5623, 5628, 5633, 5638, 5643, 5648, 5653, 5658, 5663, 5668, 5673, 5678, 5683, 5688, 5693, 5698, 5703, 5708, 5713, 5718, 5723, 5728, 5733, 5738, 5743, 5748, 5753, 5758, 5763, 5768, 5773, 5778, 5783, 5788, 5793, 5798, 5803, 5808, 5813, 5818, 5823, 5828, 5833, 5838, 5843, 5848, 5853, 5858, 5863, 5868, 5873, 5878, 5883, 5888, 5893, 5898, 5903, 5908, 5913, 5918, 5923, 5928, 5933, 5938, 5943, 5948, 5953, 5958, 5963, 5968, 5973, 5978, 5983, 5988, 5993, 5998, 6003, 6008, 6013, 6018, 6023, 6028, 6033, 6038, 6043, 6048, 6053, 6058, 6063, 6068, 6073, 6078, 6083, 6088, 6093, 6098, 6103, 6108, 6113, 6118, 6123, 6128, 6133, 6138, 6143, 6148, 6153, 6158, 6163, 6168, 6173, 6178, 6183, 6188, 6193, 6198, 6203, 6208, 6213, 6218, 6223, 6228, 6233, 6238, 6243, 6248, 6253, 6258, 6263, 6268, 6273, 6278, 6283, 6288, 6293, 6298, 6303, 6308, 6313, 6318, 6323, 6328, 6333, 6338, 6343, 6348, 6353, 6358, 6363, 6368, 6373, 6378, 6383, 6388, 6393, 6398, 6403, 6408, 6413, 6418, 6423, 6428, 6433, 6438, 6443, 6448, 6453, 6458, 6463, 6468, 6473, 6478, 6483, 6488, 6493, 6498, 6503, 6508, 6513, 6518, 6523, 6528, 6533, 6538, 6543, 6548, 6553, 6558, 6563, 6568, 6573, 6578, 6583, 6588, 6593, 6598, 6603, 6608, 6613, 6618, 6623, 6628, 6633, 6638, 6643, 6648, 6653, 6658, 6663, 6668, 6673, 6678, 6683, 6688, 6693, 6698, 6703, 6708, 6713, 6718, 6723, 6728, 6733, 6738, 6743, 6748, 6753, 6758, 6763, 6768, 6773, 6778, 6783, 6788, 6793, 6798, 6803, 6808, 6813, 6818, 6823, 6828, 6833, 6838, 6843, 6848, 6853, 6858, 6863, 6868, 6873, 6878, 6883, 6888, 6893, 6898, 6903, 6908, 6913, 6918, 6923, 6928, 6933, 6938, 6943, 6948, 6953, 6958, 6963, 6968, 6973, 6978, 6983, 6988, 6993, 6998, 7003, 7008, 7013, 7018, 7023, 7028, 7033, 7038, 7043, 7048, 7053, 7058, 7063, 7068, 7073, 7078, 7083, 7088, 7093, 7098, 7103, 7108, 7113, 7118, 7123, 7128, 7133, 7138, 7143, 7148, 7153, 7158, 7163, 7168, 7173, 7178, 7183, 7188, 7193, 7198, 7203, 7208, 7213, 7218, 7223, 7228, 7233, 7238, 7243, 7248, 7253, 7258, 7263, 7268, 7273, 7278, 7283, 7288, 7293, 7298, 7303, 7308, 7313, 7318, 7323, 7328, 7333, 7338, 7343, 7348, 7353, 7358, 7363, 7368, 7373, 7378, 7383, 7388, 7393, 7398, 7403, 7408, 7413, 7418, 7423, 7428, 7433, 7438, 7443, 7448, 7453, 7458, 7463, 7468, 7473, 7478, 7483, 7488, 7493, 7498, 7503, 7508, 7513, 7518, 7523, 7528, 7533, 7538, 7543, 7548, 7553, 7558, 7563, 7568, 7573, 7578, 7583, 7588, 7593, 7598, 7603, 7608, 7613, 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8448, 8453, 8458, 8463, 8468, 8473, 8478, 8483, 8488, 8493, 8498, 8503, 8508, 8513, 8518, 8523, 8528, 8533, 8538, 8543, 8548, 8553, 8558, 8563, 8568, 8573, 8578, 8583, 8588, 8593, 8598, 8603, 8608, 8613, 8618, 8623, 8628, 8633, 8638, 8643, 8648, 8653, 8658, 8663, 8668, 8673, 8678, 8683, 8688, 8693, 8698, 8703, 8708, 8713, 8718, 8723, 8728, 8733, 8738, 8743, 8748, 8753, 8758, 8763, 8768, 8773, 8778, 8783, 8788, 8793, 8798, 8803, 8808, 8813, 8818, 8823, 8828, 8833, 8838, 8843, 8848, 8853, 8858, 8863, 8868, 8873, 8878, 8883, 8888, 8893, 8898, 8903, 8908, 8913, 8918, 8923, 8928, 8933, 8938, 8943, 8948, 8953, 8958, 8963, 8968, 8973, 8978, 8983, 8988, 8993, 8998, 9003, 9008, 9013, 9018, 9023, 9028, 9033, 9038, 9043, 9048, 9053, 9058, 9063, 9068, 9073, 9078, 9083, 9088, 9093, 9098, 9103, 9108, 9113, 9118, 9123, 9128, 9133, 9138, 9143, 9148, 9153, 9158, 9163, 9168, 9173, 9178, 9183, 9188, 9193, 9198, 9203, 9208, 9213, 9218, 9223, 9228, 9233, 9238, 9243, 9248, 9253, 9258, 9263, 9268, 9273, 9278, 9283, 9288, 9293, 9298, 9303, 9308, 9313, 9318, 9323, 9328, 9333, 9338, 9343, 9348, 9353, 9358, 9363, 9368, 9373, 9378, 9383, 9388, 9393, 9398, 9403, 9408, 9413, 9418, 9423, 9428, 9433, 9438, 9443, 9448, 9453, 9458, 9463, 9468, 9473, 9478, 9483, 9488, 9493, 9498, 9503, 9508, 9513, 9518, 9523, 9528, 9533, 9538, 9543, 9548, 9553, 9558, 9563, 9568, 9573, 9578, 9583, 9588, 9593, 9598, 9603, 9608, 9613, 9618, 9623, 9628, 9633, 9638, 9643, 9648, 9653, 9658, 9663, 9668, 9673, 9678, 9683, 9688, 9693, 9698, 9703, 9708, 9713, 9718, 9723, 9728, 9733, 9738, 9743, 9748, 9753, 9758, 9763, 9768, 9773, 9778, 9783, 9788, 9793, 9798, 9803, 9808, 9813, 9818, 9823, 9828, 9833, 9838, 9843, 9848, 9853, 9858, 9863, 9868, 9873, 9878, 9883, 9888, 9893, 9898, 9903, 9908, 9913, 9918, 9923, 9928, 9933, 9938, 9943, 9948, 9953, 9958, 9963, 9968, 9973, 9978, 9983, 9988, 9993, 9998, 10003, 10008, 10013, 10018, 10023, 10028, 10033, 10038, 10043, 100

			damp conditions along the stream valley.
Henna Tanskanen	2001	Visitor Survey Report for Wyming Brook	The aim was to find out who uses the reserve, for what purposes and how they would like to see the reserve managed for use with the management plan.
Author unknown	2001	Silvicultural Survey and Assessment of Wyming Brook	The site was divided into Compartments and sub-Compartments to assess the plant community/species, age-class and structure. Compartment and sub-compartment to the nearest 0.1 hectare using a dot grid. Recommendations are given for work required here.
Ed Dennison Archaeological Services	2001	Archaeological Desk-Top Survey	The survey was required to gather sufficient information to assess the condition and quality and probable date of any archaeological remains in the area. 34 archaeological sites were recorded within the survey area and buffer zone. Dense shrub vegetation at time of survey restricted recording. No identified prehistoric settlement and burial sites. The absence of settlement or agricultural exploitation sites implies that the area was not used in this period. Wood pasture or wooded common and moorland are present.
Paul Ardron	2003	Wet Flush and Bryophyte Survey	A detailed look at the plant communities in these flushes, particularly the <i>Sphagnum</i> s and any other significant flora: especially mosses. Spring to maximise bryophyte recording, thus was too early to record some plants. Some patches of species-rich bryophytes are suffering from drought.
Paul Housley	2003	Moth survey	Methodology. Moths recorded at Wyming Brook between 1998 and 2003. Moths recorded. Photos and descriptions of moths.
Gareth Taylor	2003	Visitor Survey Report for Wyming Brook and Fox Hagg	SRWT conducted this visitor survey during the summer of 2003 to find out who uses the reserve, for what purpose, where they come from and how they would like to see the reserves managed for use with the new management plan. The reserves are enjoyed for their beauty and because of the large number of public rights of way. Concerns were the safety and dumping in Wyming Brook off Redmires Road.
Chris Falshaw and Richard Hill	2004	Common Bird Census	A survey to assess the bird species present at the site. The area was surveyed during the previous survey in 2001. For most species the size of the area surveyed during the previous survey may not be meaningful.
Author unknown	2004	Water Vole Survey	A component of the Sheffield LBAP is to identify the current distribution of water voles in Sheffield. This survey is essential for the accurate description of the environment for environmental assessment prior to any work that may affect water voles. 1 burrows, 1 possible latrine and 1 set of possible footprints. Mire and Rivelin Brook and a mixture of boulders, stones, rock cliffs and other features are habitats for water voles therefore is a limiting factor to their presence.
Katie Lawrence	2004	Water Shrew Survey	The Mammal Society is conducting a national water shrew survey (Mammal Society 2005). This survey hopes to find the current distribution of this species of mammals and there is concern it may be undergoing a decline in distribution due to habitat loss, pollution and pesticide use. Water shrew scats were collected and put out for the 2 week survey period.

Belinda Wiggs	2002, 2003, 2004	Woodland monitoring	Fixed point quadrats were established at points across the reserve. The survey was due to take place to assess the effects of the management on the ground flora.
Liz Jeffreys	2005	Phase One Survey	Detailed site description, a species list and habitat map.
SRWT	2010	Woodland Survey	A survey to assess woodland species present on the site. Estimated the number of each species at canopy, shrub and ground flora layers. Estimated the amount of dead wood, tree stumps, leaf litter, bare ground and rocks as well as ground cover.
Michael Sims	2010	Phase One Survey	Detailed site description, species list and habitat map.
Alistair Campbell	2010	Butterfly Survey	A survey was conducted over all of the SRWT Nature Reserves. The results were populating each site. 10 species of butterfly were found. Notable butterfly species include peacocks, commas, gatekeeper and small tortoiseshell.
Jim Clarke	2011	Common Bird Census	A detailed survey of Wyming Brook, Foxholes Plantation and the surrounding area using census methodology. This involved mapping the territories of common birds to confirm breeding. The site was visited 70 times between March and October. Nocturnal visits and fixed point raptor surveying. A total of 100 individual breeding season territories identified.
Sarah Sidgwick	2011	Visitor Survey	SRWT conducted a visitor survey with an aim of finding out where they come from and what improvements to the site they would like to see. The site is mainly used for walking, exercise, dog-walking and enjoying the view. Improvements visitors would like to see are benches, rubbish bins, Survey of Wyming Brook nature reserve more regular litter control and better signage.
Julie Riley	2016	Veteran Tree Survey	Survey of veteran and notable trees on the reserve on the reserve.
Julie Riley	2016	Winter Bird Survey	Survey carried out to record bird species overwintering on the reserve.
Rachel Stevenson and Rae Smith	2018	Visitor Survey	SRWT conducted a visitor survey with an aim of finding out where they come from and what improvements to the site they would like to see.
Julie Riley	2018	Phase One Survey	Detailed site description, species list and habitat map.