Sheffield & Rotherham

Draft Management Plan for

Carr House Meadows Nature Reserve

April 2016 – March 2026

Acknowledgements

Sheffield and Rotherham Wildlife Trust would like to thank the many individuals who have contributed to this management plan. In particular, thanks go to Steve Clements, Brian Mitchell, Julie Riley and the members of the Carr House Meadows reserve advisory group for their input.

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Summary

Carr House Meadows nature reserve covers 15.73 hectares of hay meadows, pastures and hedgerows, and lies in the Ewden Valley, northwest Sheffield. Belonging to Sheffield City Council, the site was leased by the Trust in 2001 and is managed for the purposes of conservation, public recreation and the production of sustainable hay and beef.

Carr House Meadows has numerous features of (biological) conservation interest, and is particularly noteworthy for its species-rich hay meadows and pastures. Additionally, it supports a diverse fungal community and a variety of bird species. The reserve is designated as a Local Wildlife Site under the Sheffield Plan and includes a number of public footpaths which give access to the site and connect it with the wider Rights of Way network.

This management plan covers the period April 2016-March 2026. Physical works contained in the plan are aimed at increasing the proportion and quality of priority habitats on the site and maintaining features of interest. Works to maintain and improve recreational infrastructure are also included. A survey and monitoring programme will be implemented over the course of the plan, providing data on ecological conditions which will inform future management works.

In addition to these physical works, the Trust plans to engage the public in the management of Carr House Meadows through the Reserve Advisory Group. The reserve will be through the Trust's website, and the ***Wild Sheffield*** app. An annual programme of volunteer work days and guided walks will be held to attract visitors, and to promote public understanding of its wildlife and history.

Through the implementation of this plan, the Trust intends to ensure the reserve remains true to the vision:

"Carr House Meadows is a remnant of the wildflower-rich hay meadows and pastures that were once common in the countryside. The nature reserve will offer a wonderful opportunity for people to experience a taste of the past, in a traditionally managed landscape seemingly untouched by modern agriculture, and preserved for future generations to enjoy."

1.0 Introduction

Carr House Meadows, located in Sheffield's Ewden Valley near Wharncliffeside, is an area of species-rich hay meadows and pasture. It, along with the adjacent areas of countryside, forms a section of Sheffield's rural fringe, and the southern half the reserve lies within the Peak District National Park. The reserve is managed for the purposes of conservation, public recreation and the production of sustainable hay and beef. The habitats of the reserve form part of the River Don Living Landscape area and act to combat climate change by acting as a carbon store and prevent flooding by retaining and slowly releasing rainfall.

Sheffield and Rotherham Wildlife Trust (SRWT) is part of a national association of 47 local Wildlife Trusts, which work with communities throughout the UK to protect wildlife in town and country.

Our vision is to see a Living Landscape – an amazing, green landscape for the wildlife and people of Sheffield and Rotherham, a landscape which is understood, enjoyed and cared for by local people and organisations. 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 Trust's land holding Carr House Meadows in one document, with reference to other documents where necessary.
- To outline the key long-term aims and the associated objectives which form the framework of management.
- To outline the rationale for management so as to give a clear and comprehensive explanation of why aspects need management and in what form that management will take place.
- To provide a key document from which projects are developed and associated funding sought.
- To provide consistency and continuity, so that when changes of staff take place, or changes in ownership or disposal of the land occurs, then management aims, objectives and prescriptions are continued.

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

1.2 How to use this plan

This Plan is written in 11 sections; for a detailed list of contents, please refer to the **Contents** pages.

Section 1 contains the **vision statement** for Carr House Meadows and lists the **management aims** on which this plan is based.

Sections 2-7 contain the s**ite description** and, where appropriate, evaluation against key management aims.

Section 8 comprises a **table of aims and objectives**. This describes the work that will be delivered to achieve each aim during the period covered by this management plan. The primacy of individual objectives is given as HIGH, MEDIUM or LOW. This system will be used to prioritise works when resources are limited. It is, however, our intention to deliver all objective contained within this plan.

Section 9 is the **work programme**, which is used to schedule management works and shows when individual pieces of work will be carried out. Costings for the work programme for the first three years of the plan are given here.

Section 10 contains the **Figures** – maps and charts that support the plan and which are referred to in the text.

Section 11 comprise the **Appendices**.

1.3 Vision statement and management aims

The following vision for Carr House Meadows was formulated through public consultation

Carr House Meadows is a remnant of the wildflower-rich hay meadows and pastures that were once common in the countryside. The nature reserve will offer a wonderful opportunity for people to experience a taste of the past, in a traditionally managed landscape seemingly untouched by modern agriculture, and preserved for future generations to enjoy.

To deliver this vision, the Trust has set the following aims for the management of Carr House Meadows:

1. Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value.
2. Record and monitor the reserve's ecological features with an expectation that key features will be retained or increase.
3. Secure, maintain and restore the reserve's infrastructure.
4. Assess, protect and preserve the reserve's archaeological and historic interest and farming landscape character.

5. Promote and encourage community involvement in the reserve & utilise Carr House Meadows nature reserve to raise awareness and understanding of the importance of biodiversity and the natural world.
6. Continue to develop ongoing sources of grant aid to support the management of the nature reserve.
7. Continue to develop productive land use on the nature reserve.
8. Increase public support for SRWT's through our work at Carr House Meadows.

These aims were informed by the history of the reserve, by its current biodiversity value, national and local conservation and recreational strategies, public opinion (through consultation) and the Trust's own charitable aims and objectives.

2.0 Site Details

2.1 Location and extent

Carr House Meadows nature reserve is an area of farmland consisting of 16 fields intersected by drystone walls, hedges and copses. It covers 15.73 hectares and is centred on grid reference SK 282 954. The reserve lies in northwest Sheffield, close to Wharncliffe Side in the Ewden Valley **(see Figure 1).**

2.2 Landscape value and context

Carr House Meadows is located on a steep north-facing slope, with spectacular views across the Ewden Valley. Spout House Wood, an area of ancient woodland, borders it on the southern edge, and a conifer plantation that has been clear felled and planted with broadleaves by SCC in 2010/11 between the site and Moor Hall Reservoir in the bottom of the valley.

The reserve is a visually appealing patchwork of habitat types, including unimproved pasture and species-rich hay meadows. Most fields are quite small, and are divided by a network of traditional drystone walls in varying states of repair and hedges. The field boundaries include many thick overgrown hedges, mature trees and narrow blocks of mixed deciduous woodland. Many of the hedgerows are ancient, species-rich and attractive, and as such are an especially important feature of the site, the drystone walls have an important historic landscape value. This combination of drystone walls, hedge and tree boundaries provide important landscape features, ideal habitats for a variety of native species and are in keeping with the aesthetic and environmental aims of the site.

Bud Lane, which runs along the eastern edge, is an old sunken bridleway with ancient hedge banks and is part of a public bridleway route. Carr House Lane is a narrow country lane. Along the lane, there are high hedge banks featuring diverse woodland ground flora, where the hedges have been cut there are views down the fields across the mosaic of flower meadow, woodland and hedgerow habitats in fields 4, 5 and 6.

The part of Carr House Meadows nature reserve that lies to the south of Carr House Lane, is within the Peak District National Park, while the northern half lies within a designated Area of High Landscape Value in the Sheffield Plan. Both these designations give the reserve and its surroundings protection from development.

The reserve falls within Natural England's Natural Character Assessment (NCA) 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.

2.3 Site ownership and tenure

Carr House Meadows nature reserve is owned by Sheffield City Council, and was let to the Sheffield and Rotherham Wildlife Trust on a long lease in 2002.

2.4 Designations and policy context

Carr House Meadows Nature Reserve is split between Sheffield Planning Authority and the Peak District National Park, with the boundary running along Carr House Lane. As a result, the land to the north of Carr House Lane is covered by the Sheffield Nature Conservation Strategy and Unitary Development Plan, while the southern section of the site comes under the jurisdiction of the Peak District National Park's Structure and Local Plans.

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 purposes 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 also placed a duty on National Park Authorities, in pursuing these twin purposes, to "seek to foster the economic and social well-being of local communities by working closely with the agencies and local authorities responsible for these matters, but without incurring significant costs."

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

Carr House Meadows lies within the with the exception of the plantation woodlands is within the 'Dark Peak and Moorland Fringe' as defined in the **Peak District Core Strategy.** This designation is lined to policies under which the National Park will "seek opportunities to protect and manage the tranquil pastoral landscapes and distinctive cultural character of the Dark Peak Yorkshire Fringe" and "limit development to appropriate signage and interpretation, in line with the recreation Strategy, Interpretation Plan and Working With people and Communities Strategies" (all available on line).

The northern half of Carr House Meadows lies within the Green Belt and is identified in the Sheffield Plan, as an Area of Higher Landscape Value, and part of the South Yorkshire Forest. Under these designations the site is covered by policies which protect it from development and promote its management for biodiversity and public recreation.

Several Public Rights of Way footpaths run through Carr House Meadows. The **Public Rights of Way Improvement Plan (2007)** seeks to facilitate and develop inclusive access to woodlands, riverbanks, water edge and urban and rural open space and ensure that all public rights of way are safe and easy to use. It includes the following policies that are relevant to Carr House Meadows:

Policy 14. In areas designated for nature conservation the impact of access provision will be treated with sensitivity and with due regard to the likely effects on the fauna, flora and any important geology.

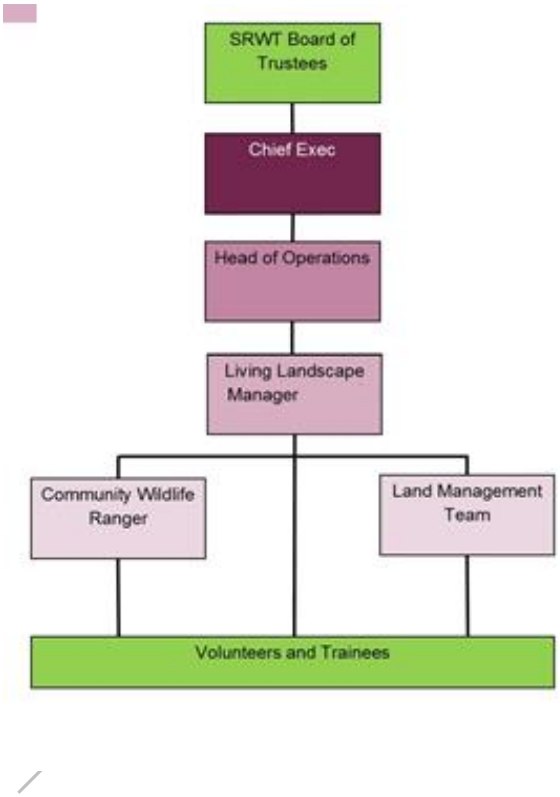
Policy 17. To provide confidence building measures and opportunities for wider path use through public education, community liaison and physical improvements.

Policy 26. To work with path user groups, landowners and occupiers, parish councils, the National Park Authority, adjacent local authorities and community groups to better focus path provision and reduce conflict.

The residents at Carr House Farm have access and extraction rights to the hydraulic ram and header tank, which takes water from a spring in field 6 and pumps it to a settling tank in field 7.

2.5 SRWT staff structure for reserve management

The organogram below shows all staff who are directly involved with management of the site.



2.6 Site safety, security and maintenance

2.6.1 Site safety

A site specific risk assessment has been written for Carr House Meadows and is reviewed on an annual basis. Further risk assessments are prepared for specific tasks and events at the site as necessary. The Trust also manages the reserve in line with its many detailed polices covering environmental management and Health and Safety. These are amended and updated at regular intervals or to reflect legislative changes.

Carr House Meadows is regularly patrolled by SRWT staff and volunteers. Any problems are logged on a spreadsheet and addressed as soon as possible. Problems and incidents reported by members of the public are also logged on the spreadsheet and are dealt with as necessary. Any

known accidents or incidents that occur on the reserve are recorded on the relevant accident forms. An accident book is kept at SRWT headquarters.

Tree inspections for the entire site are carried out every six years, with trees adjacent to Carr House Lane assessed every two years. Associated remedial work is undertaken as recommended.

2.6.2 Site security

Carr House Meadows' boundaries are marked and secured by drystone walls and fencing. |Access points to the reserve are provided with gates, squeezes and/or stiles as appropriate, to allow access by legitimate users of the site whilst excluding entry by horses, bikes, cars (other than management vehicles), quad bikes and motorcycles.

2.6.3 Litter, cleanliness and vandalism

No litter bins or dog waste bins are present on site, rather visitors are encouraged to take their litter/dog waste home for disposal. The installation of litter/dog waste bins has been discounted due to the low footfall on site, the costs associated with maintaining these and a desire to keep the reserve as 'wild' as possible.

The Trust's Land Management Team and/or Community Wildlife Rangers visit the site at least once per month.

2.7 Past and current land use

Carr House Meadows is farmland, owned by Sheffield City Council. The area comprising the reserve used to be part of two farms, owned by a Mr. Elliot and a Mr. Rowe. Previous tenants include a Mr. Ardy and his daughter. The land was historically used for grazing livestock (pastureland).

According to Mr Stan Helliwell (pers comm), the 5 hay meadows (fields 4, 15, 16, 17 and 18) were ploughed and reseeded with traditional hay meadow seed mix by Mr Elliot, about 25 years ago (approx 1985). These fields have been traditionally managed as hay meadows since then, with no spraying of chemicals.

Mr Elliot latterly used to keep up to 20 sheep on the grazing fields. A small area of conifer plantation was established on the reserve c1970.

Sheffield and Rotherham Wildlife Trust took on responsibility for the site in 2001, putting it under Countryside Stewardship Scheme (Higher Level) and managing the grasslands for nature conservation purposes (**Figure 2**). A grazing license has been issued to Mr John Helliwell, a local farmer, who keeps cattle on site at a stocking density of 0.4 beasts per hectare, from the 1st May to 31st July (cows and their calves), with aftermath grazing on the hay fields until the end of October with roughly 12-15 head of cattle. The aftermath grazing must not cause overgrazing or poaching and should result in an average sward height should be 50mm by the end of the summer. Mr Helliwell also harvests hay from the meadows in line with conservation practises (July cut with hay left in the field for at least 36 hours to release the seeds) and manages the aftermath grazing of the same.

2.8 Adjacent land ownership and use

The conifer plantation to the north of the reserve is owned by Sheffield City Council, and managed by the Department of Parks and Countryside. Spout House Wood and Spout House Farm, on the southern boundary of the site, are both owned by Mr. J. Helliwell, who holds the grazing licence for Carr House Meadows. On the southern side of the road, the land to the east is owned by Old Thorn House Farm. The land to the west is owned by Carr House Farm, which is situated in the middle of the reserve. The adjacent land to the west of fields 7 & 8 is owned by Fairhurst Farm (Mr D. Owen).

2.9 Services, and site access

A water ram, two catch pits and a header tank (all connected by pipes) which supply water to Carr House Farm, lie on the boundary between fields 5 and 6.

Telegraph wires run overhead along and across Carr House Lane.

Mains electricity runs through the pond field (field 7), leading to Carr House Farm.

The location of these services is shown in **Figure 3.** Further on-site investigations are required prior to works taking place, and the necessary permissions sought if applicable.

2.10 Public Rights of Way

The reserve contains 3 stretches of Public Right of Way footpath, designated in 2001, to connect it to the wider Public Rights of Way network in the Ewden Valley (**Figure 4**).

2.11 Current funding schemes, income and grants

The grasslands of Carr House Meadows are entered into a Higher Level Stewardship scheme. This scheme, which is managed by Natural England, aims to deliver significant environmental benefits in areas with more complex environmental management needs, through the provision of hectarage-based payments. The agreement is for 10 years, and commenced on 1st April 2011 with completion due in 2021.

The nature reserve is registered for Single Farm Payments, with the grazier holding the entitlements. The grazing income from the reserve is not large, but provides a reliable long-term source of funds.

3.0 Environmental Information

3.1 Topography

Carr House Meadows nature reserve lies on a north facing valley side, at an altitude of between 175m and 230m above ordnance datum.

3.2 Geology and pedology

The underlying geology of Carr House Meadows Nature Reserve is the Millstone Grit series, consisting of bands of sandstone and mudstone.

The soils at Carr House Meadows are slightly acidic, slowly permeable, seasonally wet and loamy.

3.3 Hydrology

Carr House Meadows is a wet site, receiving water from the hillside above it in the form of streams, seasonal springs and seeps, with areas of marshy grassland forming around them (**Figure 5**). Several streams run from south to north, along field boundaries. Runnels and seepages can be found in most of the meadows, resulting in areas of marshy grassland and wet flushes. Some of the seepages dry out in dry weather, whilst others are permanent features throughout the year.

A pond is present on site (field 7). This was re-excavated in October 2005 and is fed by a field drain. However, it still regularly dries out during the summer months and it is suspected that the drainage system in field 8 above has become blocked.

In recent years there has been observed that certain fields – notably fields 15, 16, 8 and 10- are becoming wetter, with increasing areas of marshy grassland habitat. It is thought that this increase in soil humidity is caused by the blockage of drainage channels running along the reserve's southern boundary, coupled with the possible collapse of field drains in field 8. Increased wetness has also be observed at the bottom (north-western corner) of field 6, where a large area vegetated by marshy grassland has formed since 2001.

During the course of this plan SRWT will work to maintain the balance of different habitat types on the reserve by improving drainage along its southern boundary. The drainage of fields 6 and 8 will also be investigated with a view to restore or improve the existing field drainage system. If feasible, surplus water from field 8 will be fed into the pond in field 7, and that from field 6 into a newly created small pond at the bottom of the field.

3.4 Climate

Data from the Sheffield's Weather Station:

Temperature	January	July
Average (Celsius)	4.0	16.6
Rainfall	January	July
Average (mm)	88	51

Local sources maintain that the average annual temperature is rising. In addition, local plants are also believed to be flowering earlier on average. The rainfall in the region is approximately 800 mm per annum but it has been suggested that this may increase in future years, affecting soil water levels across the reserve.

It should be noted that the reserve and surrounding woodlands act to ameliorate the effects of extreme weather on a local level. Together they help to reduce the risk both of flooding after heavy rainfall by soaking up and slowly releasing heavy rains, with the tree roots and other vegetation binding the topsoil and preventing erosion. Additionally, the trees on site, and in particular the soils, act as a carbon store, helping to combat climate change.

The prevailing wind on the reserve is from the southwest.

The following sections of the plan describe in detail the background to the management plan aims and the way in which these will be developed across the lifetime of the plan.

4.0 Biodiversity

Aim 1. Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value.

4.1 Biodiversity Action Plans

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

Table 1: BAP Priority habitats and species

UK BAP Priorities (short and medium list only)	
Habitats	**Species**
Ancient/species rich hedgerows Lowland and upland meadows Lowland dry acid grassland Rush pasture	**Bullfinch** (*Pyrrhula pyrrhula*) **Song thrush** (*Turdus philomelos*) **Rose wax cap fungus** (*Hygrocybe calyptriformis*)
Peak District BAP Priorities	
Habitats	**Species**
Hay meadows Ponds Rush pasture Unimproved pasture	**Bullfinch** (*Pyrrhula pyrrhula*) **Lapwing** (*Vanellus vanellus*) **Song thrush** (*Turdus philomelos*) **Rose wax cap fungus** (*Hygrocybe calyptriformis*)
Sheffield BAP Priorities	
Habitats	**Species**
Ancient/species rich hedgerows Lowland and upland meadows Lowland dry acid grassland Rush pasture Standing water (ponds)	Badger (*Meles meles*) Bat species Blackcap (*Sylvia atricapilla*) **Bullfinch** (*Pyrrhula pyrrhula*) Chiffchaff (*Phylloscopus collybita*) Curlew (*Numerius arquata*) Garden warbler (*Sylvia borin*) Great spotted woodpecker (*Dedrocopus majus*) Greenfinch (*Carduelis chloris*) Goldfinch (*Carduelis carduelis*) Pied flycatcher (*Ficedula hypoleuca*) **Song thrush** (*Turdus philomelos*) Swallow (*Hirundo rustica*) Willow warbler (*Phylloscopus trochilus*)

	Rose wax cap fungus (*Hygrocybe calyptriformis*)

Species highlighted in bold are on the UK short list of globally threatened and declining species, and are therefore afforded the highest priority.

Species-rich hedgerows have been defined as priority habitat in the UK Biodiversity Action Plan (UKBSG, 1995) and Sheffield Local BAP (Glasscock, 2001). The site contains species rich hedgerows, with a ground flora of ancient woodland indicator species such as bluebells (a local Biodiversity Action Plan priority species) and dog's mercury. Scaly male-fern (*Dryopteris affinis*), a grade B Local Red Data Book species, occurs in one of the hedgerows.

Spotted flycatcher (*Muscicapa striata*), tree pipit (*Anthus trivialis*) and willow tit (*Poecile montana*), all red-listed as birds of Conservation Concern by the RSPB, have all been recorded as being present (though not confirmed as breeding) on site.

The number of waxcap fungi recorded on site confirms that the reserve is of national importance for waxcap grassland.

Other species of particular note are:

- Southern marsh orchid (*Dactylorhiza praetermissa*)- grade A Local Red Data Book species.
- Common lousewort (*Pedicularis sylvatica*), yellow rattle (*Rhinanthus minor*), and golden male-fern - grade B Local Red Data Book species.
- Clubrush (*Schoenoplectus lacustris*), hemlock water dropwort (*Oenanthe crocata*), ragged robin (*Lychnis flos-cuculi*), and common spotted orchid (*Dactyloriza fuchsii*) are locally scarce. (Nb: Clubrush was not recorded during the 2015 Phase 1 survey, although anecdotal evidence suggests it is still present on site. Consequently, confirmation that it remains on site is required).

4.2 Habitats

Carr House Meadows nature reserve consists of a series of fields including hay meadows, grazing pasture and marshy grassland, divided by a network of drystone walls, hedges, strips of mature woodland and streams. The fields are a complex mosaic of unimproved or semi improved, slightly acid to neutral grassland, with extensive areas of wet marshy grassland. The fields are grazed seasonally by cattle, with some being managed as hay meadows with a cut in late summer (after 15th July, as specified in the Countryside Stewardship Scheme and the Higher Level Stewardship agreement). A dense block of conifer-dominated woodland is present on site, and the field immediately south of Carr House Farm (field 7) contains a field pond.

The distribution of the different habitats on the reserve is given in **Figure 6.** The management regime for each field showing which fields are cut for hay and which are grazed is given in **Figure 2.**

4.2.1 Grassland

The majority of the fields at Carr House Meadows can broadly be described as lowland meadows, a category which includes most forms of unimproved neutral grassland (hay meadows and pasture). This grassland is botanically diverse, containing a variety of grass species, many herbs

plus some sedges, mosses and rushes. Areas of grassland can be categorised as unimproved, semi-improved or marshy under the Phase 1 methodology (**Figure 6**). Under the National Vegetation Classification (NVC) the main communities map as being NVC type MG5 *Cynosaurus cristatus - Centaurea nigra* (crested dog's tail & common knapweed) mesotrophic grassland, with areas of MG6 *Lolium perenne - Cynosaurus cristatus* (perennial rye-grass and crested dog's tail) grassland, U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* (sheep's fescue, common bent and heath bedstraw) acid grassland and MG10 *Holcus lanatus- Juncus effusus* (Yorkshire fog – soft rush) marshy grassland.

Given the constraints placed by management (fields are managed as a unit, even though several grassland types are present within them) the grasslands are categorised, described and evaluated by management regime (haymeadow or pasture) below.

Hay meadows

Description and evaluation:

5 of the fields within the reserve are managed as hay meadows (fields 4, 15, 16, 17 and 18), whereby an annual hay crop is harvested in July each year. All share a similar species composition, although the exact range and relative composition does vary. These fields largely vegetated by moderately species and flower rich unimproved neutral grassland (MG5 and MG6), although small areas of marshy grassland (MG10) are present within them.

No one grass species is dominant within the meadows; instead a good mix including crested dog's tail, red fescue (*Festuca rubra*), common bent, perennial rye grass, sweet vernal grass (*Anthoxanthum odoratum*), rough meadow grass (*Poa trivialis*) and Yorkshire fog comprise the sward. Herbs are abundant within the sward, including abundant red clover (*Trifolium pratense*), common vetch (*Vicia sativa*), meadow buttercup (*Ranunculus acris*), yellow rattle, ribwort plantain (*Plantago lanceolata*), common sorrel (*Rumex acetosa*), ox-eye daisy (*Leucanthamum vulgare*), common knapweed (*Centaurea nigra*), selfheal (*Prunella vulgaris*), common bird's-foot trefoil (*Lotus corniculatus*), pignut (*Conopodium major*) and yarrow (*Achillea millifolium*).

The species composition in each hay meadow is largely the same, although the abundance of each varies. The most species rich are fields 4, 15, 17 and 18 where the herbs listed above make up a high percentage of the sward. Robust grasses are more abundant in field 16, which increases productivity of the hay crop, but makes it less floristically diverse.

Several notable plant species occur on this site, they are important because of their local scarcity. One of these is yellow rattle (*Rhinanthus minor*), which is highlighted in the Sheffield Nature Conservation Strategy as being a grade B species in the Local Red Data Book. This species occurs frequently across the site, is abundant in places, and is an important, traditional component of the hay meadow mixture. Yellow rattle is semi-parasitic, growing on the roots of some grasses, weakening the host plant and inhibiting the growth of those grasses. This allows for other less robust species of flowering plants to compete and thrive. Therefore it is an important component of a highly biodiverse, species rich meadow.

'Meadows Beyond the Millennium – the Future of Hay meadows in the Peak District (Buckingham et al., 1998) demonstrates that there has been a dramatic decline in the number of flower-rich meadows between the mid 1980s and the mid 1990s, with species such as field scabious declining by over 80%, yellow rattle and common knapweed both declining by up to

60%, and pignut and oxeye daisy declining by about 55%. This can be attributed to changing management practises involving intensive farming and the increased use of chemical fertilisers and pesticides. Traditionally managed hay meadows, such as these at Carr House, are therefore a rich asset to our wildlife, culture and landscape, comprising botanically-rich assemblages which provide an important habitat and food resource for many species of invertebrates, birds and mammals.

Management:

In general, species-rich unimproved wildflower meadows have a high biodiversity because their soils contain only moderate nutrient concentrations; they are subject to a cutting regime that favours less vigorous species and the encouragement of seed-setting, there is an absence of herbicides and pesticides. This combination of conditions promotes high botanical diversity.

The hay meadows at Carr House have been traditionally managed for the last 35 years, a practise which will continue during the period covered by this management plan. No artificial fertilisers or pesticides are applied (although some addition of nutrients in the form of dung deposited during aftermath grazing occurs annually). The hay meadows will be cut on or after 15th July, so as to allow the wildflower to develop seed and to allow as many invertebrates as possible to complete their lifecycles. The hay will then be spun and left on the ground for at least 36 hours to allow for seed drop. A metre wide strip will be left uncut on the periphery of each field.

After the hay crop has been removed the fields will left for 3 or so weeks to allow the herbage to re-establish, then cattle will be put on the fields for aftermath grazing. There is no suggested stocking rate for aftermath grazing, and levels are according to the herbage available and the ground conditions. The aim is to achieve an uneven sward, ranging in heights of 50mm to 150mm by the end of the grazing season (end of October), with no overgrazing or poaching.

The thistles (creeping thistle *(Cirsium vulgaris*) and marsh thistle (*Cirsium palustris*)) - present in the meadows and pasture provide an important nectar source for invertebrates, and a seed source for finches. However, they, along with ragwort (*Senecio jacobea*), devalue a hay crop, and are avoided by cattle in the pastures. Therefore, leaving them to develop unchecked, results in their spread and the eventual displacement of other flowering species. **Some control is consequently required each year to prevent their spread and will be carried out over the period covered by this plan.** The actions of the cattle's hooves promote the germination of thistles and ragwort, especially after the hay cut when the soil is exposed. Therefore thistle control should be undertaken in May or June (prior to the hay cut) on the larger areas of thistle (the exact locations should be selected based upon an annual assessment). Spot treatment with herbicide may be deemed appropriate, depending on the resources available for hand pulling. Larger patches of creeping thistle may be topped to prevent the development of seed. Some annual control of ragwort by pulling is also necessary; in particular in the fields adjacent to the hay meadows. However, some should be retained (in fields furthest from the hay meadows), as it is the food source for the caterpillar of the cinnabar moth (a diurnal moth).

Pasture

Description and Evaluation

10 of the fields within the reserve are managed as grazing pasture (fields 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, and 14). These pastures contain a mosaic of different habitat types, most notably unimproved and semi-improved acid grasslands, marshy grassland and scrub. All share a similar species composition, although the exact range and relative composition does vary across them.

The majority of the grassland areas present at Carr House can be categorised as NVC type U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* acid grasslands. They occur across the pastures and are the dominant grassland type in the more free-draining areas. Despite their relative acidity they support a range of calcifuge species such as common bent (*Agrostis capillaris*), sheep's fescue, red fescue, tormentil (*Potentilla erecta),* heath bedstraw, heath woodrush (*Luzula multiflora*), lousewort and harebell (*Campanula rotundifolia*).

Neutral grassland areas also occur within the grazed fields, such as NVC type MG5 *Cynosaurus cristatus - Centaurea nigra* grassland and MG6 *Lolium perenne - Cynosaurus cristatus* (perennial rye-grass and crested dog's tail) grassland. These support species such as Yorkshire fog, crested dog's tail, sweet vernal grass, common cat's ear *(Hypochaeris radicata),* common knapweed (*Centaurea nigra*), and common sorrel (*Rumex acetosa*) with occasional bird's-foot-trefoil (*Lotus corniculatus*), lady's mantle (*Alchemilla vulgaris*), ribwort plantain, red clover and white clover (*T. repens*), meadow buttercup and creeping buttercup (*R.repens*).

MG10 *Holcus lanatus- Juncus effusus* (Yorkshire fog – soft rush) marshy grassland is present across the pastures, forming in hollows, along seeps and by the side of streams. The dominant species in these areas is soft rush (*Juncus effusus*), with frequent compact rush, (*Juncus. conglomeratus*) and tufted hair grass (*Deschampsia cespitosa*); locally abundant marsh foxtail (*Aloepecurus geniculatus*), floating sweet grass (*Glyceria fluitans*) and greater birdsfoot trefoil (*Lotus pedunculatus*). There is a variety of flowering plants in most of the wet areas, including cuckoo flower (*Cardamine pratensis*), square stemmed willow herb (*Epilobium tetragonum*), bog stitchwort (*Stellaria uliginosa*), marsh bedstraw (*Galium palustre*), yellow pimpernel (*Lysimachia nemorum*), lesser spearwort (*Ranunculus flammula*), marsh thistle (*Cirsium palustre*), ragged robin (*Lychnis flos-cuculi*), and brooklime (*Veronica beccabunga*). In the 2001 survey seven sedge species were also recorded, indicating the undisturbed nature of these areas. Southern marsh orchid (*Dactylorhiza fuchsii*), a grade A Local Red Data Book species, is rare but consistently present on the reserve.

Management

The grazing regime for these pastures involves cattle grazing between 1st May and 31st July at a stocking density of no more than 0.4 Livestock Units per hectare. After the annual hay cut, the animals then aftermath graze the hay fields and the pastures at an optimum stocking density of 1.0 Livestock Units per hectare(based on the available herbage of 14.82 ha) until the end of October. The aim is to achieve an uneven sward, ranging in heights of 50mm by the end of the grazing season (end of October), with no under or over grazing or poaching. **This regime will continue over the period covered by this management plan, in line with the HLS agreement.**

The grassland in the pond field (field 7) is ungrazed and allowed to develop into a taller, ranker sward. However, an occasional cut will prevent the development of unwanted scrub and retain an open aspect to the pond. The area is hunted over by tawny owls and little owls. Therefore it is important to retain some areas of rough grassland and young scrub to encourage small mammals

(a food source for owls). Therefore, 50% of the grassland in this field should be cut every year on rotation.

4.2.2 Scrub within the grasslands

Scrub habitat at Carr House Meadows Nature Reserve occurs mainly along the hedgerow boundaries, extending into large patches of dense continuous scrub in and around fields 3, 5 and 6. Its composition varies being dominated by hawthorn (*Crataegus monogyna*) in some areas and bramble (*Rubus fruticosus*) in others. In some fields there are extensive areas of scrub containing hawthorn, rowan, rose, holly, elder, bramble and nettles.

Scrub is a valuable habitat for wildlife, providing nectar, berries, nuts, and vegetation, and supports many invertebrate species, all of which are a food source for mammals and birds throughout the year. The vegetation also provides protection for small mammals and birds, nesting and roosting sites, and perching and song posts. Bramble flowers provide a particularly rich source of nectar for insects from spring through to autumn, and the fruits provide an essential food source for many birds and small mammals in the autumn. The retention of scrub within the reserve's grasslands is, however, a balancing act. A certain amount being desirable, but not so much that this habitat displace large areas of grassland. Therefore **scrub control will continue throughout the period covered by this plan. Scrub clearance to allow access to the pump and tanks for the residents of Carr House Farm will also be continued**.

4.2.3 Hedgerows

Description and evaluation:

Hedgerows are linear stretches of woodland environment, providing shelter, bird perching posts, feeding and nesting sites. They are extremely valuable green corridor routes, enabling animals to move around otherwise open sites.

Hedgerows form an integral part of both Carr House Meadows and the Ewden Valley. The reserve's boundaries are of considerable ecological interest, because they consist of a mix of ancient drystone walls, overgrown mature hedges, ditches, banks and hedgerow trees. The large, overgrown hedgerows contain a variety of maturing trees, including sessile oak (*Quercus petrea*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and alder (*Alnus glutinosa*). Other woody hedgerow species include rowan (*Sorbus aucuparia*), hazel (*Coryus avellana*), hawthorn (*Crataegus monogyna*), silver birch (*Betula pendula*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), rose (*Rosa* sp.) and dense holly (*Ilex aquifolium*). Bird cherry (*Prunus padus*) occurs in five of the hedges. This species is rare in Sheffield, being recorded in only about 7 1km squares within the Sheffield area.

Many of the hedges have a ground flora that is indicative of ancient woodland such as bluebell (*Hyacinthoides non-scripta*), yellow archangel (*Lamiastrum galeobdolon*), wood sorrel (*Oxalis acetosella*), broad buckler fern (*Dryopteris dilatata*), lady fern (*Dryopteris felix-femina*), male fern (*Dryopteris felix-mas*) and dog's mercury (*Mercurialis perennis*). The canopy within the mature hedgerows is mixed, with the dominant species as oak. The presence of an abundance of bluebells in the ground flora makes the closest National Vegetation Classification (NVC) community W10 (*Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland).

A hedgerow survey was carried out in September 2001, and repeated in 2004 using the **Hedgerow Evaluation Grading System (HEGS)**. The results are given below. This method involves scoring each hedgerow for overall hedgerow structure, connectivity, diversity, and associated features. These scores are then used to calculate a final grade for the hedgerow. The results of the survey are provided in Table 3, and the locations of the hedgerows are shown in

Figure 7. The majority of the hedgerows were found to be of high to moderately high ecological value in the HEGS survey (i.e. had a grade of –2 or above) and 10 out of the 15 hedges were found to be 'important' under The Hedgerows Regulations 1997, meaning they have legal protection.

Table 3: Results of HEGS survey

Boundary number	***Description***	***Hedgerow length (m)***	***Structural score/20***	***Connectivity score/8***	***Diversity score/8***	***Associated features score/12***	***Overall HEGS grade***	***Protected under Hedgerow***
13 & 17	Line of mature trees bordering the site	88	13	4	8	0	**1**	**Yes**
56	Wet woodland/stream	150	14	4	7	3	**-1**	Yes
22, 23 & 24	Trees lining the bridleway, and wall	188	10	2	8	5	**-2**	**Yes**
36, 37 & 38	Old coppiced hedgerow	216	13	6	8	3	**1**	**Yes**
67	Large trees and post and wire	54	13	3	7	3	**2+**	**Yes**
42, 43 & 45	Old coppice and large trees.	216	11	5	7	0	**-2**	**Yes**
63,64 & 65	63 drystone wall & top wire	180	11	3	7	2	**3+**	Yes
46	Large trees and stream.	126	12	7	8	3	**-1**	**Yes**
66	Wet woodland/stream	139	13	4	6	2	**2+**	**Yes**
40b	Mixture of open areas and recently coppiced hazel, and wall	49	11	4	4	6	**3+**	**Yes**
60	Line of large old coppiced hazel and drystone wall	146	13	7	5	0	**2+**	**No**
44a	Gappy line with old coppice stools	37	14	3	6	6	**2**	**No**

44b	Gappy line with old coppice stools	56	11	4	4	6	**3+**	**No**
40a	Mixture of open areas and recently coppiced hazel (to east of boundary) and wall	27	8	1	3	5	**-3**	**No**
39	Previously coppiced stools and drystone wall	210	13	5	6	0	**2+**	**No**

Key to overall HEGS grade:

-1	1	1+	-2	2	2+	-3	3	3+	-4	4	4+
High to very high ecological value			High to moderately high ecological value			Moderate ecological value			Low ecological value		

The UK Biodiversity Action Plan estimates that 42% of British hedges were considered to be ancient or species-rich, about 138,000km (UK Biodiversity Group, 1995). Between 1947 and 1985, about 3000,000 km (22%) of hedgerows were lost in England and Wales, and from 1984 to 1990, there was an estimated loss of 21% of English hedges. In more recent years, the rate of loss due to removal has decreased, following the introduction of the Hedgerows Regulations 1997, but losses due to neglect have continued. Species-rich hedgerows have been defined as priority habitat in the UK Biodiversity Action Plan (UKBSG, 1995) and Sheffield Local BAP. The reserve's hedgerow, with their ground flora containing ancient woodland indicator species such as bluebells (a local Biodiversity Action Plan priority species), dog's mercury and scaly male-fern (a grade B Local Red Data Book species), are therefore a key conservation priority for the reserve.

Management:

Many of the reserve's hedgerows have had little management prior to 2006 and few are now stock proof without their associated fencing. Some hedge-laying and coppicing has been carried out in the recent past, and this has added to the structural diversity. In many places however, sections of hedgerow have developed into lines of trees and, without further management this process will continue. **Work to manage the reserve's hedgerows through hedgelaying and gapping up, to create a range of structures, heights, species and profiles will be included in the latter half of this plan**

Some insensitive hedge cutting along the lane has taken place in the past. Cutting of vegetation is of importance in terms of road safety. Liaison with the relevant authorities is required to prevent or reduce the deleterious impacts that some cutting regimes may have upon these hedgerows.

4.2.4 Woodland

Two types of woodland are present on the reserve. These comprise a small plantation in the southern half of the reserve and a very small area of deciduous woodland on boundary 16.

The woodland in field 11 consists of a very dense plantation of Norway spruce, planted in 1975. In 2001 the interior of the plantation was dense and impenetrable, with little tree regeneration and little or no ground flora. Since 2001, a gradual programme of thinning, working from its edges towards the centre has increased light levels and allowed some natural establishment of a range of boadleaved species including rowan, birch, cherry, hazel and oak.

The plantation provides cover and perching posts for passing birds, and food for small mammals and some bird species**. Future management will aim to encourage greater diversity of species and structure by further thinning of the coniferous element, thus providing suitable conditions for deciduous trees to regenerate. Non-native deciduous species such as beech and sycamore will be removed.** The resultant mixed woodland will complement the wider network of hedges, rows of mature trees and small patches of woodland on the reserve. A coniferous component will be retained, so as to support firecrest, coal tit and goldcrest.

This small plantation provides a habitat that links to the conifer plantation to the north of the reserve, which is managed by Sheffield City Council. The management policy of the woods to the north of the reserve is to apply the principles of continuous cover forestry through group felling of the conifers to encourage natural regeneration of native deciduous species.

The area of wet woodland on boundary 16 contains an abundance of alder, and some ash, with a ground flora containing yellow pimpernel (*Lysimachia nemorum*), tufted hair grass (Deschampsia cespitosa), meadow sweet (*Filipendula ulmaria*), pignut (*Conopodium majus*) and remote sedge (*Carex remota*). It requires no intervention during the period covered by this plan.

4.2.5 Ponds and Watercourses

Description and evaluation:

A single small pond is present on the reserve, in field 7. Previously described in the previous management plan as providing a habitat for frogs, toads and newts, with the locally scarce common clubrush (*Schoenoplectus lacustris*), common spike rush (*Eleocharis palustris)*, bulrush (*Typha latifolia*) and reed sweetgrass (*Glyceria fluitans*), periodic drying out has resulted in the suspected loss of some of these species.

Ponds are threatened by their continuing widespread loss, particularly from agricultural systems and have been included in the Sheffield Local Biodiversity Action Plan as a priority habitat. In order to improve the conservation value of this pond, more work is required to minimize the number of years in which it dries out. This will be achieved by further coppicing the scrub surrounding it, and possibly by reinstatement of the field drains in field 8 to feed additional water into it (see Sec 3.3 Hydrology). A full botanical and amphibian survey of the pond is also required as a matter of priority.

Several streams run from south to north across the site and into More Hall Reservoir. Two of these enter the reserve from the north, whilst the third stems from issues in field 6. These watercourses are narrow and shallow with a gravel substrate and flow for most of the year but can dry out in the height of the summer months. The areas of wet marshy grassland associated with the issues and streams are wetter than the others around the site.

The reserve's streams require no specific management, other than protection from excessive trampling and poaching which is achieved by controlling stocking levels. When ponding at

gateways and pinch-points occur, water is released by digging, or contained by the use of sleepers (field 14).

4.3 Species

Aim 1. . Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value.

4.3.1 Fungi

Carr House Meadows is an excellent site for fungi, with 99 species being recorded in 2015 (Clements and Mitchell, 2015), many of which, particularly the wax caps (*Hygrocybe* spp.), meadow corals and pinkgills (*Entolomas* spp), are indicators of unimproved acid grassland.

Waxcap species dominate the southern half of the reserve, both in occurrence over the site and also in the number of fruiting bodies seen in 2015. Bells (*Galerina* spp.), pinkgills, mottlegills (*Panaeolus* spp) and bonnets (*Mycena* spp) were amongst the other most common genera. The slime fungus *Mucilago crustacea* was also quite ubiquitous on grass.

Significantly fewer waxcap species and fruiting bodies were identified on the northern part of the site. 8 species (165 fruiting bodies) were confidently named. This compares with around 1000 FBs of at least 13 species in the southern part. Rose waxcap and slimy waxcap were not found, suggesting that the southern part of Carr House Meadows is better for waxcap fungi. Crimson waxcap (H. punicea) was however recorded, bringing the total number of waxcap species to 14 (possibly 16) for the entire reserve. A much larger number of Parrot Waxcaps was noted on the northern part. These findings make Carr House Meadows a site of national importance as a waxcap grassland. Irrespective of the precise number of taxa recorded, the actual numbers of Hygrocybe and Entoloma fruiting bodies underpins the conservation importance of the site. Considerable numbers of rare Pink and Slimy Waxcaps were recorded.

Far fewer Entoloma – Pinkgill toadstools were found on this survey (north). They were still in some abundance in compartment 14 (south). Only 4 clavarioid fungi (clubs and corals) were recorded on this survey (north), restricted to comps. 5 and 6, compared with six species from the south part. However, an additional and impressive additional species, Golden Spindles – Clavulinopsis fusiformis, brings the reserve tally to 7. No Earthtongues or Scarlet Caterpillarclubs were found in the N. part.

A very distinct difference in the pattern of fungal fruiting was noted between the pasture and hay meadow compartments. The hay meadow areas were far less species diverse than the pasture, but nonetheless supported some large populations of meadow waxcap. The northern side of Carr House Meadows has areas of longer grass in which yellow fieldcap (*Bolbitius titubans*) thrives.

A number of notable fungi in the hedgerows and log-piles across the reserve. Of particular interest was a waxy crust on hazel - *Vuilleminia coryli*. In addition, at least 4 species of crust fungi (*Stereum* spp.) and 2 species of Wrinked Crust (*Phlebia* spp.) were recorded. Woodland fungi from the adjacent plantation to the north was a feature of this site.

The high mycological interest of this site is partly due to the wide diversity of habitats, and partly due to management practise (grazing and soils unimproved by fertilisers). In order that these species continue to thrive, it is important that sward length is kept short in the pastures and no fertilisers are applied. These requirements are covered by the HLS agreement for the reserve. Additionally however, it is important that no liming of the grasslands occur, and that dead wood habitat is retained on the reserve. **These conditions will be adhered to during the period covered by this plan.**

It is also agreed that the reserve will not be advertised as a 'fungal foray' destination to the general public, although guided fungal walks may periodically be held to inform and educate people about fungal conservation.

4.3.3 Invertebrates

The invertebrate fauna of Carr House Meadows is not thoroughly understood and has not been the subject of systematic survey. Surveys of the reserve have been largely insect focused, and survey of other invertebrate groups has not been carried out. Nevertheless, from what is known from records gathered over the years, the species found are typical of the geographic region and habitats present on site. Given the reserve's size, antiquity and surroundings, it is not unreasonable to suppose that it provides important habitat for a wide variety of invertebrate life.

A preliminary invertebrate survey was undertaken in August 2001. Many of the grassland areas have a high value for invertebrates, as the fields are unimproved and many support a diverse sward. A dozen species of beetle were recorded in the grassland pitfall traps: five of these were the ground beetles *Pterostichus madidius, P. melanarius, Calathus* spp. and a number of individuals of the leaf beetle *Longitarsus luridus.* The greatest numbers were recorded in the moderately damp neutral grassland. Fewer species and individuals of ground beetles were recovered from the woodland edge pit fall traps, but a locally important rove beetle (*Atheta taxiceroides*) was identified. Woodland edge pitfall traps contained more litter species such as springtails, rove beetles, and the ground beetle *Bembidion nitidulum* that is characteristic of moist, clayey soils close to running water.

The extensive wet grassland habitats support communities of Dipterans (true flies) – in particular hoverflies, Craneflies and Dolichopids. Sweep netting sampled nearly twenty species of Diptera. Three species of Cranefly collected were indicative of wet or flush-type habitats, and included a preliminary identification of the locally important species *Yamatotipula pruinoisa*. Eleven species of hoverflies included the rat-tailed maggot species that favour muddy margins and shallow waters of ditches and streams. The locally rare species *Platycheirus scambus* was also recorded, which is a species with a mostly easterly distribution (and nationally a northern species of marshy ground). The only other locally important species recorded was *Sphaerophoria menthastri*, which is probably the second most common *Sphaerophoria* in our region (after *S. scripta*), and has a wide preference for habitats including upland cloughs, woodland, lowland valleys, grassland and marshes (Whitely, 1987).

The tall herb communities support tall stands of thistles, nettles and common knapweed, providing a rich source of nectar for bees, wasps, flies and beetles. Four species of bumblebees were seen around the site and one parasitic fly (*Conops qaudrifasciata*) was found on common knapweed near the pond. Brambles provide a rich source of nectar and juice from berries in autumn; they also form an important structural component, providing habitat for many invertebrate species.

A modest range of both Hemiptera (true bugs) and plant hoppers were collected, including a collection of the hitherto little recorded locally important species *Macrosteles variatus*, which is mainly a southern species. There was a great abundance of under-recorded species such as the common *Cicadella viridis*, especially on the wet rushy areas. Grassland plantbugs were recorded such as *Stenodema calcaratum*, a Mirid bug that feeds on flower buds and unripe grains of common bent and meadow foxtail (*Alopecurus pratensis*). Southwood and Leston (1959) describe *Stenotus binotatus* as 'often abundant in hedgerow verges, neglected pastures and commons'. This species is particularly found feeding on the flower heads of cocksfoot. *Plagiognathus arbustorum* was found on nettles in field 14.

The boundaries of this site are extremely varied in structure, as most hedges are unmanaged. The walls, especially where a hedge or individual trees grow on top or cover it, provide a huge range of hiding places and lairs for spiders, beetles, harvestmen, roosting and overwintering sites for bugs, butterflies, etc. Oaks of varying ages are particularly frequent along some field boundaries, and these yield a small range of Cynipid wasp galls such as the oyster gall *(Andricus anthracina).*

During an invertebrate transect survey of the reserve's northern fields, carried out in 2014, a number of butterfly species, including large white (*Pieris* brassicae), ringlet (*Aphantopus hyperantus*), peacock (*Inachis io*) and small tortoiseshell (*Aglais urticae*) were recorded.

Although limited, the records clearly show that the variety of habitats and niches found on the reserve positively influenced the invertebrate assemblages present. With regard to uncommon invertebrates, the most significant habitats are: rotting wood and decaying organic matter of all types; woodland edge and wet and marshy areas.

Woodland management practices that promote structural and botanical diversity will benefit many woodland invertebrates. Dense bramble clumps in sunny locations are of particular value and should be retained. The partial removal of non-native conifers and their replacement by broadleaves species in the reserve's plantation will also increase the attractiveness of this habitat to invertebrates.

Dead wood, and in particular standing dead wood and fallen trees, should be retained on site wherever possible, as they provide both a primary habitat for species such as the wood-boring beetles, and a secondary habitat for fungal-feeding species, whilst the development of water-filled rot holes in tree trunks will benefit hoverflies such as *Myathropa florae.* **The creation of habitat piles using brash produced by woodland/hedgerow management will be encouraged**, as these piles provide a valuable habitat for many invertebrates, such as spiders. The retention of large pieces of dead wood along boundaries, is of particular benefit to several invertebrate groups.

Cattle grazing on the in-pastures produces a structurally diverse sward, ranging from tall, tussocky grassland and short, close-cropped areas, thereby providing a range of microhabitats for a variety of invertebrates. The use of Avermectin (a livestock wormer) is detrimental to certain groups of invertebrates such as ground-dwelling nematodes, since chemicals lethal to these species will pass through the cow's/sheep's gut and be deposited in the droppings. Consequently, its use on livestock grazing at Carr House Meadows is prohibited.

The flower-richness of the reserve's hay meadows ensure that they provide a useful source of nectar for many insects. **The retention of an unmown strip of rough grassland around the edge of hay meadows** during hay-making is particularly important to many ground dwelling species and will be continued.

Both the streams and flush habitats present on the reserve support invertebrate communities. The composition of the stream communities is largely influenced by water chemistry, flow-rate and the structural complexity of the watercourse. Trampling by cattle as they come to the streams to drink has produced areas of poached ground, which can be utilised by a variety of invertebrate species.

More systematic recording, of a wider number of phyla and classes is necessary to determine the full extent of the reserve's invertebrate fauna. However, the level of specialism required, and associated high costs, may limit what is possible. **SRWT will work with individual recorders, through the Sorby Natural History Society and other naturalist societies to encourage further and more extensive invertebrate recording on the reserve during the course of this management plan.**

4.3.4 Amphibians and reptiles

Little is known about the herpetofauna of Carr House Meadows, although Common Frog (*Rana temporaria*), Common Toad (*Bufo bufo*) and Grass Snake (*Natrix natrix*) have all been recorded in the vicinity of the reserve. The reserve provides excellent habitat for all three species but could be improved by **the addition of a second pond to provide suitable breeding habitat for amphibians**. This is will be created in field 6. **Piles of rotting vegetation are necessary for breeding grass snake and will be created in field 7 during the period covered by this plan.**

4.3.5 Birds

A Common Bird Census (CBC) was carried out in 2001 by the Sheffield Bird Study Group (Medforth 2001). This survey was repeated (by different surveyors) in 2011 when 31 bird species, 5 red listed birds and 7 amber listed birds were recorded, as shown below:

Table 2: Red and Amber listed bird species recorded in 2011

Common name	Latin name	Status	Conservation Importance
Dunnock	*Prunella modularis*	Presence (1 probable breeding territory)	Amber
Green woodpecker	*Picus viridis*		Amber
Lapwing	*Vanellus vanellus*	Flying	Red
Mistle thrush	*Turdus viscivorus*	Presence	Amber
Song thrush	*Turdus philomelos*	edge presence	Red
Spotted flycatcher	*Muscicapa striata*	Definite breeding	Red
Swallow	*Hirundo rustica*	Flying	Amber
Swift	*Apus apus*	Flying	Amber

Tree pipit	*Anthus trivialis*	Flying	Red
Whitethroat	*Sylvia communis*	Presence	Amber
Willow warbler	*Phylloscopus trochilus*	Definite breeding	Amber
Willow tit	*Poecile montana*	Presence	Red

Species **red-listed** in the RSPB Birds of Conservation Concern are those that are recorded to have declined by 50% in the 25 years between 1972 to 1997. A**mber listed** species are those which have declined by 25% to 49% from 1972 to 1997.

A wintering bird survey of the reserve was carried out in 2015. This consisted of a simple survey which involved walking a circuit of the entire site on three occasions. 34 species were recorded on or overflying the reserve during this survey, the majority of which were observed along the hedges and edges of fields, or flying between hedges.

Blue Tit, Robin and Great Tit, species of woodland and hedgerow, were the most frequently encountered species and were also the most numerous. Fields 3 - 6 were found to be the richest in bird life during this survey, their boundary with the adjacent woodland, lower elevation and areas of scrub and hedgerow providing suitable winter shelter and feeding opportunities. Conversely, fields in the southwest of the site (fields 7-13) were the least rich, perhaps because of their open aspect and lack of cover. Snipe were noted using areas of *Juncus* growth as a feeding ground during this survey.

Field 6, a mosaic of wet, acid and dry neutral grassland with extensive scrub encroachment, and was used by foraging pied flycatchers in 2001. Nest boxes were erected in the vicinity, in an attempt to increase the population, however no record of these being adopted by the birds for breeding has be obtained and the species were not recorded as present in 2011. Pied flycatchers are birds of mature woodland meaning that the reserve cannot be considered a core habitat for this species.

The mosaic of habitat types on this site, particularly the extensive hedgerows and woodland edge, provide ideal habitat for many species, providing shelter and a food source for insectivorous, and seed and berry-eating birds. All singing birds were recorded along the hedgerows and perimeter woodlands, with little avian activity observed within the fields themselves (pheasant, snipe and lapwing excepted).

Management of the reserve's hedgerows (in particular, hedgelaying), and the retention of field trees, some areas of scrub, marshy grassland and standing dead wood, are key to managing the reserve for birds. Continuing to convert the plantation from conifer to mixed woodland will also prove beneficial. **The management of the hedges to create a range of structures, heights, species and profiles will be included in the latter half of this plan** (when funding through HLS again becomes available. The retention of scrub and marshy grassland is, however, a balancing act. A certain amount being desirable, but not so much that these habitats displace large areas of equally desirable unimproved grassland. Therefore **drainage work and scrub control will continue throughout the period covered by this plan. Standing dead wood will be retained on site wherever this is compatible with public safety.**

Long grass is a favoured hunting ground for owls, so field 7 (the pond field) should be retained as a long sward. However, if allowed to develop naturally, this field will eventually become scrub followed by woodland. **Therefore 50% of the sward will be cut every other year, on a rotation**.

4.3.6 Mammals

Badgers (*Meles meles*) are frequent users of the southern half of the reserve, where they feed on earthworm. Badger activities will be considered when carrying out access provision, the installation of gates, fences, wall restoration or meadow management operations. It will also be important to maintain and improve access for badgers between their sets and foraging areas, and to maintain a mosaic of habitats suitable for their needs. This may be achieved through gap-planting and linking of hedgerows, and by continuing the existing management regime. A map of badger activity will be referred to prior to undertaking management. This is available at the Trust offices; in the interests of protecting the sets and areas of activity, this information is not for the public domain.

Bats, of unspecified species, have been observed flying over the reserve, but no formal records exist, and no systematic survey has been carried out. All of the bat species found in the Sheffield area are Local Biodiversity Action Plan priority species, with the pipistrelle (*Pipistrellus* species) also being a national BAP priority species.

Grey squirrel (*Sciurus carolinensis*) and **rabbits** (*Oryctolagus cuniculus*) are occasionally recorded on the reserve. **Brown hare (***Lepus europaeus***) are also present.**

A small mammal survey using Longworth traps in 2013 recorded wood mouse (*Apodemus sylvaticus*) and bank vole (*Myodes glareolus*) on the reserve. Both these species are commonly predated by owls.

4.4 Survey and monitoring

Aim 2. Record and monitor the reserve's ecological features with an expectation that key features will be retained or increase.

The collection of accurate and informative biological data is of prime importance when assessing the condition of the reserve and its habitats, and when evaluating the success of management practises. Once collected this data forms the basis of an 'early warning system' to alert of deleterious changes, as well as a baseline against which the success of conservation practise can be measured.

Previous years have seen the collation of existing biological records for Carr House Meadows, where available, plus a range of surveys being undertaken.

Over the course of this plan **SRWT aims to collect additional biological data for Carr House Meadows. Emphasis will also be placed on the collection of biological records for groups where this is lacking, in particular invertebrates, herpetofauna and bats. A full Phase 1 habitat survey of the reserves grasslands and a HEGS survey of its hedgerows,** will be carried out periodically. **The Flower Spike count survey carried out in 2013 will also be repeated and a botanical survey of the pond carried out.**

5.0 Infrastructure

Aim 3. Secure, maintain and restore the reserve's infrastructure.

5.1 Boundaries - internal and external drystone walls and fencing

The majority of the reserve's boundaries are drystone walls, which make up a significant part of the landscape character of the Ewden Valley **(Figure 7)**. Many of the walls are in a good state of repair. However, some have fallen into disrepair, whilst others show evidence of structural decline and are reinforced with post and wire fencing.

The movement of grazing animals between different field, allowing control of grazing over the site, requires intact field boundaries. Some of the dry stone walls on site require spot repairs. Others (in particular 36, 37, 38, 39 and 40 running along Carr House Lane) require substantial rebuilding, a job made more difficult by their location, size and the number of trees and shrubs that grow on and within them. These walls retain the reserve, and the roots of these trees have undermined their structural integrity in places. It is possible that, in the future, heavy rains or winds could undermine them further. However, at this point, removing the trees and shrubs would prove more harmful than retaining them, as their roots are helping to bind the pieces of stone and surrounding soil together. Monies to allow a professional assessment of these walls and the repairs needed, will be sought during the period covered by this plan. However, their implementation is dependent upon resources available. If resources are not secured, some wall repairs or rebuilding could be included in an application of further capital works under the Higher Level Stewardship scheme.

Hedgerows and lines of scrub and trees are often found on field boundaries in combination with walls. These are described under 'Biodiversity'.

5.2 Footpaths and access furniture

All paths at Carr House Meadows are trodden paths, with no surfacing. This is in keeping with the level of use, the rural character of the site, and the terrain. All the necessary access furniture, including stiles and gates has been installed during previous management planning periods but is now coming up for renewal. **Access furniture along public rights of way will be replaced as required during the period covered by this plan.**

A carved bench offering a resting place with views over the valley has been installed on boundary 46 but is falling into disrepair. **Funding to restore or recreate this feature will be sought under the period covered by this plan**, with the bench being made safe until it is possible to do so.

It is the Trust's intention to make access between the fields north of Carr House Lane easier during this plan, by the addition of stiles or squeezes on field boundaries.

The access point between fields 4 and 5 (boundary 56) will be improved and widened during the period covered by this plan.

5.3 Water supply structures

The spring in field 6 that supplies water to Carr House Farm, and associated tanks and mechanisms for collecting and moving the water must be protected from pollution damage, as the house is dependent entirely on this water source. Catchment pits in field 6 collect water from the aquifer. The water is then taken up to a header tank in field 7. This process is powered by the water ram (also in field 6). **These catchment tanks, the water ram and the header tank will be kept clear of vegetation as part of the maintenance programme**. **Additionally, oak and blackthorn saplings should be removed from the pipeline leading from the header tank in field 7 to the farmhouse below, to prevent undermining of the pipes from trees roots.**

5.4 Culverts and crossings

A culvert runs alongside boundary 46, which is vulnerable to blockage by silt at the northern end (the bottom of the field). **This will require clearance on an annual basis**. Debris also accumulates at the crossing from field 4 to field 5, on boundary 56. This accumulation results in flooding of the path, leading to excessive poaching of the ground by cattle. Again, **annual clearance is required.**

5.5 Car Parking

A small parking area is present in field 18. This car park is not available to the public on a daily basis but is opened by SRWT when holding events or meetings on the reserve. The car park substrate comprises a heavy plastic mesh through which the grass grows. **It requires strimming on an annual basis.**

6.0 Cultural Context

Aim 4. Assess, protect and preserve the reserve's archaeological and historic interest and farming landscape character.

Aim 5. Promote and encourage community involvement in the reserve & utilise Carr House Meadows nature reserve to raise awareness and understanding of the importance of biodiversity and the natural world.

6.1 Site archaeology

The Peak District National Park Archaeology Service surveyed the site as part of the Upland Survey requirements for Countryside Stewardship application in 2000. The pond in field 7 was noted, but anecdotal evidence suggests that this pond is a relatively recent landscape feature, having been dug as a pond or possibly as a swimming pool about 25 years ago, by the then grazier Mr Elliot.

The fields to the south of Carr House Lane are in the Peak District; therefore they are included in a historic landscape character study covering the whole of the Peak District. Hence it is known that the land was enclosed prior to the preparation of the map of Bradfield, dated 1825 – 1827.

The surviving field walls and adjacent hedgerows on the holding are a component of the historic landscape of the Ewden Valley. For this reason, all wall furniture such as stiles, sheep creeps and stone gates should be retained, and drystone walls should be rebuilt where necessary, and maintained.

6.2 Recreation

The creation of new Public Rights of Way across the reserve and their linkage into the wider network of public rights of way in the Ewden Valley has contributed significantly to enhancing the reserve's value as a recreational resource. Nevertheless, Carr House has a low footfall and it is rare to meet visitors when working on site.

Visitors to the reserve fall into 3 broad categories: local people who visit regularly, walkers who pass through the reserve as part of a longer route and those attracted to the reserve for specific events such as volunteer work days and guided walks.

The nature of the reserve and its location both suggest that a high level of visitor usage would be undesirable and potentially damaging for this site. This view has been supported during recent consultations with the Reserve Advisory Group. **Consequently, the plan will focus on maintaining the current access provision rather than expanding it. Guided walks and training in conservation skills through volunteer work days will continue to be offered. However, any desire to increase footfall to the area will require an area-wide, rather than reserve lead, approach.**

6.3 Disabled access

The accessibility of Carr House Meadows nature reserve and the surrounding area to people with mobility disabilities is unfortunately but unavoidably limited by the nature of the terrain and, in

particular, by the gradients present on site. Access to the reserve by wheelchair or mobility scooter is not possible, nor is the reserve a suitable candidate for wheelchair accessibility to be improved.

6.4 Information and interpretation

Due to its nature, location and the policies covering the area, Carr House Meadows is not deemed a suitable site for on-site interpretation, other than the carved bench already provided (see sec 5.2).

Remote interpretation of the reserve exists in the form of a reserve leaflet, available from the Wildlife Trust and on the Wild Sheffield app which includes a self-guided walk around the reserve.

The Trust will work to provide more information about the reserve on its website, including a map and downloadable leaflet, during the period covered by this plan. Additionally, **the Wild Sheffield app,** which includes a self-guided walk around the reserve, **will be promoted.**

6.5 Community engagement

The reserve lies within the electoral ward of South Wortley. The local community resides in two electoral wards, South Wortley and Stocksbridge. Approximately 36,500 people live within these wards, which comprise of rural villages and steel manufacturing areas surrounded by open countryside. The community around the reserve is sparsely distributed and there are few organised groups, societies, etc., making the potential for direct, regular participation in the reserve more difficult than in more urban locations. However, Stocksbridge Steel Valley and the Upper Don Project already carry out environmental work in the area, and are very keen to be involved with work on the reserve. Generally, Stocksbridge contains a younger population than South Wortley or Sheffield as a whole, with a high proportion of the population aged less than 49 years of age. In particular there are more 10 to 19 year olds (12.8%) than the Sheffield average (11.5%). The majority of the population in South Wortley and Stocksbridge is white, less than one percent being from an ethnic minority. The majority of people from ethnic minority groups are of Indian descent.

Opportunities for the local community involvement in the reserve are provided by the Reserve Advisory Group which meets twice a year, guided walks and volunteer work days. **The Trust will continue to develop and support these opportunities during the course of this plan.**

6.6 Outdoor learning

Since 2001 SRWT has been working with primary schools, secondary schools and youth groups to bring young people from the local area to the woods. Outdoor learning is a key area of development for SRWT at the current time. The Trust provide environmental education sessions which support the national curriculum, as well as accredited/non accredited training to support young people and adults to develop life skills, and gain skills and experience in the environmental sector, as well as learning opportunities for all the family.

Currently, the Trust's focus is in attracting school and youth groups to one of our outdoor learning hub sites (Ecclesall Woods, Greno Woods and Centenary Riverside) or in delivering sessions on or near individual school premises. The size, topography and lack of facilities at Carr House

Meadows nature reserve make it unsuitable as an education hub. Consequently, the outdoor learning team will deliver sessions on the reserve only at the specific request of local schools.

7.0 Economic

Aim 6. Continue to develop ongoing sources of grant aid to support the management of the nature reserve.

Aim 7. Continue to develop productive land use on the nature reserve.

Aim 8. Increase public support for SRWT's through our work at Carr House Meadows.

Carr House Meadows has received steady investment since 2001. The majority of this investment has taken the form of survey work, the installation and maintenance of access features and boundaries, and in general maintenance of habitats on site In return, the reserve has generated a steady supply of hay and beef.

In order that such investment can continue to be made, the economic opportunities offered by the reserve are considered below.

7.1 Past, present and future grant funding

The whole reserve was entered into a Countryside Stewardship agreement, from September 2000 and this came to an end in 2010. The nature reserve is now under an Environmental Stewardship Scheme known as Higher Level Stewardship (HLS). The agreement is for 10 years, and commenced on 1st April 2011 with completion due in 2021. A new programme of required works has been agreed with Natural England, including application of specific grazing methods and levels, maintenance and re-instatement of boundary features and provision of certain access infrastructure. This generates an annual income of approximately £4200.00, with additional capital works payments additional to this.

There is limited potential to attract small grant funding to the site. It may also be possible to attract some small-scale funding to the reserve through more far reaching landscape-scale conservation projects.

SRWT will seek to secure additional grant funding throughout the period covered by this plan, to support the delivery of its aims and objectives.

7.2 Productive land use

Farming

Carr House Meadows has been part of a working farm for many years. It will be a requisite of any future management regime to continue grazing and hay cutting, and it will also be essential to set grazing levels and fees at a level sufficient to allow continued grazing to be economically sustainable. If necessary, this would require the adjustment of the amount of grazing rent that is charged, in line with any changes in grazing pressure needed to achieve the reserve's conservation objectives.

The grazing and hay cutting rights to Carr House Meadows Nature Reserve are leased to the Helliwell family, who have managed the land as part of their commercial farming business for the last 17 years, bringing in a small grazing income for the reserve, which is passed to Sheffield City Council.

Management of the hay meadows generate hay each year. As the hay meadows are managed without the use of artificial fertilisers, the hay crop yield is low, particularly that from field 4. The hay crop is used in conjunction with bought silage and barley as winter feed for the calves that are kept on site during the summer.

The Trust will continue to let Carr House Meadows for extensive farming over the period covered by this plan.

Collection of yellow rattle seed

Yellow rattle and other wildflower seed has previously been harvested on a rotation from the hay meadows on the reserve, for use on grassland creation projects at Carbrook Ravine and on other conservation projects. The reserve provides the potential for future wildflower seed harvesting and sale, although it is difficult for this to provide a financial return on a regular basis.

It should be noted that fields should only be harvested for wildflower seed one year in 3. When dealing with yellow rattle, no more than half a field (in strips) should be harvested in any given year.

7.3 Membership recruitment

Wildlife Trust membership across the city is steadily increasing, and a pro-active approach has been adopted by the Trust to ensure the trend continues. The work at Carr House, if perceived positively by members and the public, can support membership recruitment both locally and across the city. Conversely however, any negative publicity or public perception about the management of the reserve could work to hinder the same. Consequently, the work carried out must not only be of the highest standard but must be communicated well to the general public (and in particular to the communities surrounding the woods) in order to have a positive effect on membership. The relative affluence of the reserve's catchment area and the relatively high proportion of South Wortley residents aged between 40 and 59 both suggest that there is the potential for attracting new SRWT members.

The Trust will continue to use local and city-wide media to publicise its work at Carr House Meadows (**and the rationale behind it), and to encourage engagement with its work.** This publicity will aim to reach existing and potential members. There is also great potential to recruit members through events held on site.

7.4 Employment and training

The reserve currently provides part-employment to three people directly through the Trust and also contributes indirectly to others e.g. local farmers and suppliers. The capacity to increase employment opportunities is not great, rather the challenge will be to sustain the current level of

activity as the number of people employed depends directly on the revenue available to carry out work on site.

Unemployment levels in the communities surrounding the reserves vary from low to high, and a mixed picture of academic achievement is also seen. This suggests that local training and employment initiatives would be a priority for some of the communities immediately adjacent to the reserve, if funding for such became available. Today, the reserve provides a variety of opportunities for skills development, in terms of practical conservation techniques, habitat management, ecological identification and forest management and the Trust's practical conservation work teams, which include trainees and volunteers, work regularly in the woods.

7.5 Communication and marketing

At the current time, welcome signage, in the form of the Trust's standard wooden 'Welcome to Carr House Meadows' sign, are present at three of the entrances to the site. Despite these, it is possible for visitors to the site enter and leave without realising they are moving on and off a Trust managed nature reserve.

It is recommended that the Trust works to improve its on-site presence on the reserve. **This will be achieved by ensuring that all entrances into the reserve are marked in some way** – at the very least by small plaques welcoming the visitor to the reserve and giving contact information for the Trust.

7.5.1 Printed materials and website

A webpage about the reserve is present on the Trust's website giving general information about the reserve. www.wildsheffield.com/nature-reserves/our-reserves/carr house meadows

The Trust will work to provide more information about the reserve on its website, including a map and downloadable leaflet.

7.5.2 Events

Events are dealt with under the Community Engagement section of the plan.

8.0 Management aims and objectives

Aims	Objectives and prescriptions	Cross Ref	Priority
	BIODIVERSITY (Aims 1 to 2)		
1. Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value. .	**1.1 Maintain a management regime beneficial to the reserve's grasslands, to promote maximum benefit for their botanical and fungal interest, and (where this is not contradictory) to increase their value to invertebrates, birds and mammals.**	***Sec 3.3, 4.2.1; 4.2.2, 4.2.5 Figure 17***	
	• Continue to cattle graze the reserve's pastures (fields 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, and 14) at a stocking density of no more than 0.4 Livestock Units per hectare between 1st May and 31st July, followed by an optimum stocking density of 1.0 LU ha (based on the available herbage of 14.82 ha) until the end of October, in line with the HLS agreement.		HIGH
	• Continue to manage fields 4, 15, 16, 17 and 18 as hay meadows, with a mid July cut and the hay left on the ground for at least 36 hours to allow for seed drop, followed 3 weeks later by aftermath grazing to produce an uneven sward, min height 50mm, in line with the HLS agreement.		HIGH
	• Control the spread of scrub into the reserves grasslands, concentrating particularly on fields 2,3, 5, 6 and 15.		HIGH
	• Control the spread of ragwort and both creeping and marsh thistle across the reserve as required.		MEDIUM
	• Work to maintain the balance of different habitat types on the reserve by improving drainage along its southern boundary.		MEDIUM
	• Investigate the field drainage system of fields 6 and 8 with a view to restoration or improvement. If feasible, drain surplus water from field 8 into the pond in field 7, and that from field 6 into a newly created small pond at the bottom of the field.		MEDIUM
	1.2 Work to retain and improve the landscape and biodiversity value of the reserve's hedgerows.	***Sec 2.2, 4.2.3, 4.3.3, 4.3.5***	
	• Work to retain and improve the structure and density of selected hedgerows through hedge-laying and gapping up, to create a range of structures, heights, species and profiles.		HIGH

Aims	Objectives and prescriptions	Cross Ref	Priority
	BIODIVERSITY (Aims 1 to 2)		
1. Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value *cont.*	**1.3 Protect and improve the reserve's freshwater habitats.** • Coppice and reduce the willow and other scrub in and around the pond in field 7 to assist water retention. • Create a new pond in the north-west corner of field 6	***4.2.5, 4.3.4***	HIGH MEDIUM
	1.4 Improve the biodiversity value of the reserve's conifer plantation by encouraging its development to mixed woodland. • Slowly reduce the plantations coniferous element through thinning to promote the establishment of deciduous species. • Select against the establishment of non-native species such beech and sycamore	***Sec 4.2.4, 4.3.3***	MEDIUM LOW
	1.5 Protect and support the reserve's high mycological interest. • Ensure the sward length in the pastures is kept short, in line with the HLS agreement, through conservation grazing. • Prohibit the use of lime or fertiliser on the reserve. • Retain and increase the reserve's stock of fallen and standing dead wood. • Ensure that the reserve is not publicised as a destination for fungal foraging. • Hold periodic fungi walks inform and educate the public about fungal conservation. • Carry out further surveys of the reserve in spring (hedgerows and woodland) and September (early waxcaps and pinkgills)	***Sec 4.3.1, 4.3.3***	HIGH HIGH HIGH HIGH LOW MEDIUM

Aims	Objectives and prescriptions	Cross Ref	Priority
	BIODIVERSITY (Aims 1 to 2)		
1. Protect, enhance and maintain the reserve's habitats to retain and enhance its biodiversity value *cont.*	**1.6 Protect and support the reserve's invertebrate interest** • Retain clumps of bramble in sunny locations • Create discreet habitat piles using brash produced by woodland/hedgerow management on the reserve • Prohibit the use of Avermectin (a livestock wormer) on the reserve. • Continue the practise of retaining an unmown strip of rough grassland around the edge of the reserve's hay meadows (Beetle banks) for ground dwelling invertebrates • Work with individual recorders, through the Sorby Natural History Society and other naturalist societies to encourage further and more extensive invertebrate recording on the reserve	***Sec 4.3.3***	MEDIUM LOW HIGH HIGH MEDIUM
	1.7 Retain and improve the value of field 7 for wildlife • Retain a 50% pa sward cut to benefit small mammals, owls and kestrels. • Create discreet 'compost piles' of cut grass adjacent to the pond to create breeding habitat for grass snake.	***Sec 4.3.4, 4.3.5, 4.3.6***	HIGH MEDIUM
2. Record and monitor the reserve's ecological features with an expectation that key features will be retained or increase.	**2.0 Collect additional biological data to support decision-making and management of the reserve** • Carry out a HEGS survey of the reserve's hedgerows • Carry out periodic Phase 1 and NVC surveys of the reserve • Carry out a repeat Total Spike Count survey for key indicators of botanical interest on the reserve • Carry out a breeding bird survey for the reserve • Engage with local naturalists through the Sorby Natural History Society and other organisations to encourage the recording of groups for which biological information is lacking, in particular invertebrates, herpetofauna and bats • Ensure biological records for the reserve are passed on to the relevant Biological Records Centre on an annual basis.	***Sec 4.2, 4.3, 4.4***	MEDIUM HIGH MEDIUM HIGH HIGH HIGH

Aims	Objectives and prescriptions	Cross Ref	Priority
	INFRASTRUCTURE (Aim 3)		
3. Secure, maintain and restore the reserve's infrastructure.	**3.1 Secure, maintain and rebuild the reserve's boundaries.** • Secure monies to allow a professional assessment of these walls retaining the southern part of the reserve along Carr House Lane and develop a plan for restoring and stabilising the same. • Seek money to continue to repair and restore drystone walls across the reserve, where necessary, through and the repairs needed, Higher Level Stewardship and/or other funding bodies • Repair and restore walls as funding allows.	***Cross ref Sec 2.2, 5.1,***	MED/HIGH MEDIUM MED/HIGH
	3.2 Maintain public access to the reserve • Replace access furniture along Public Rights of Way over the course this plan. • Strim the car park during the growing season to allow its use for events and site meetings. • Restore or remake the interpretative bench on site • Improve the connectivity of fields 5 and 6, and fields 2 and 3 by the addition of stiles or squeezes on field boundaries.	***Sec 6.2***	HIGH MEDIUM MEDIUM LOW
	3.3 Maintain the reserve's culverts and water supply structures • Desilt the culvert on boundary 46 as required. • Widen and improve the crossing from field 4 to field 5, on boundary 56 to improve drainage and reduce poaching. • Clear scrub from the area the pump and tanks in fields 6 and 7 to allow access to these structures for maintenance purposes. • Clear oak and blackthorn saplings from the pipes carrying water to Carr House Farm from field 7 to prevent undermining by trees roots.	***Sec 5.3, 5.4***	HIGH MEDIUM HIGH HIGH

Aims	Objectives and prescriptions	Cross Ref	Priority
	CULTURAL CONTEXT (Aims 4-5)		
4. Assess, protect and preserve the reserve's archaeological and historic interest and farming landscape character.	**This aim will be realized through the delivery of the other objectives listed in this report.**	***Cross ref Aims 1 and 3***	HIGH
5. Promote and encourage community involvement in the reserve and utilise Carr House Meadows. **to raise awareness and understanding of the importance of biodiversity and the natural world.**	**5.1 Interpret the reserve and its biodiversity to the general public** • Increase the amount of information provided about the reserve on the Trust's website, including a map and downloadable leaflet • Run guided walks on the reserve allowing the public to explore and enjoy different aspects of its biodiversity. • Promote the ***Wild Sheffield*** **app,** which includes a self-guided walk around the reserve**.**	***Sec 6.2.1, 6.2.2, 6.2.3***	HIGH HIGH HIGH
	5.2 Engage local people in the management of the reserve • Provide training in conservation skills through volunteer work days • Provide opportunities for local people to contribute their ideas and opinions to the management of the reserve and the implementation of its management plan through Reserve Advisory Group meetings.	***Sec 6.5***	HIGH HIGH

Aims	Objectives and prescriptions	Cross Ref	Priority
	ECONOMIC (Aims 6-8)		
6. Continue to develop ongoing sources of grant aid for the management of the nature reserve.	**6.1 Continue to make grant applications and associated claims for revenue and capital works.** • Submit claims for HLS funding as required. • Re-enroll the reserve in HLS in 2021 • Investigate additional sources of funding, including EPIP and landscape partnership funding (if available) to support projects and capital works. • Seek to increase Trust membership in the communities surrounding the reserve through events and activities	***Cross ref Sec 7.1***	HIGH HIGH HIGH
7. Continue to develop productive land use on the nature reserve.	**7.1 Support the management of the reserve through sustainable farming.** • Work with local farmers to farm the reserve extensively over the period covered by this plan.	***Cross ref Sec 4.2.1, 7.2***	HIGH
8. Increase public support for SRWT's through our work on Carr House Meadows.	**8.1 Increase the profile of the Sheffield and Rotherham Wildlife Trust on Carr House Meadows** • Continue regular patrols by SRWT staff and volunteers. • Install 'welcome' plaques at all site entrances	***Cross ref Sec 7.6***	HIGH MEDIUM
	8.2 Ensure that the objectives of the management work at Carr House Meadows are clearly communicated to members, the communities surrounding the reserve and the wider public. • Update the Carr House Meadows pages of the website regularly, making sure details of up and coming events are clearly listed. • Upload the reserve management plan onto the Trust website • Produce news releases when key management milestones are reached, or new initiatives are begun and distribute to local media.	***Cross ref Sec 7.6***	HIGH HIGH HIGH