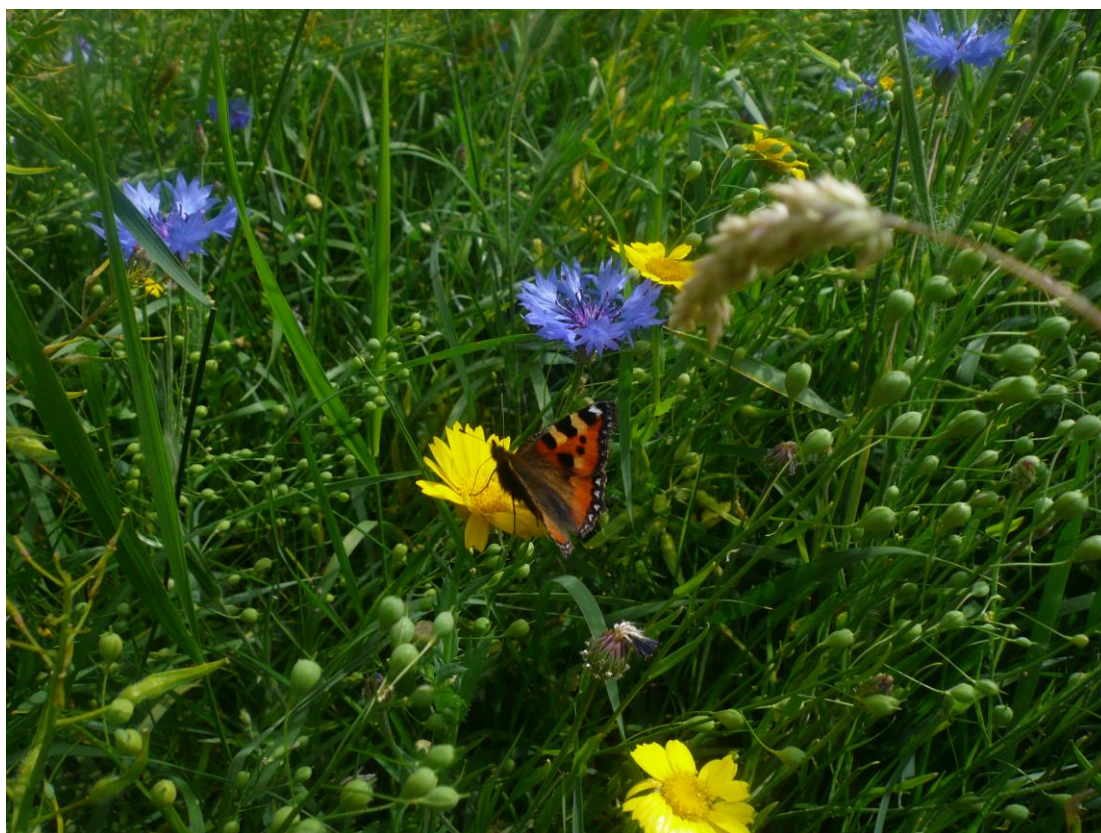


Elvaston Castle & Country Park
Local Nature Reserve
2016-2021

Management Plan

Release Candidate 1.0



Derbyshire County Council
Countryside Service

James Mounter

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PART 1

Introduction and Rationale

Elvaston Castle's Local Nature Reserve (LNR) was developed in the 1980's and designated as an LNR in 1989 by Derbyshire County Council's (DCC) Countryside Service. It covers an area of 13.5 hectares. In 2011 it was the only designated reserve in South Derbyshire. The site is well placed in relation to Derby City and is within easy reach of the A6 and A52 (**Table 1.0**).

Geologically the area was formed as a result of alluvial (*ancient riverbed*) deposits from the Trent and Derwent valley. The reserve itself sits on a mixture of gravel and clay with a topping of sandy loam.

The eastern section of the Nature Reserve contains many impressive veteran trees that were originally part of William Barron's landscape design from the 19th century. From this section the reserve is connected to the estate and rest of the park by the northwest part of the main lake.

The water that feeds the lake system was channelled through the reserve in order to continue supporting the established hydrology and drainage systems of the park and gardens. Prior to designation, the canals surrounding Gretricks field were excavated (1980/81) to secure the land from poachers. The lake and islands were created between 1982 and 1985 from what was unimproved grass land, which was previously used as grazing for horses.

These actions, together with ultimate designation of the reserve as an LNR, were the result of DCC's Biodiversity Action Plan (BAP) and a desire to create designated green space away from Urban Derby.

It has resulted in the development of a mosaic of habitats, which now provide important wildlife corridors.

The LNR and wider Elvaston estate remain ecologically important and together contain a mosaic of many valuable habitats. The estate as a whole was designated as a Wildlife Site by Derbyshire Wildlife Trust in May 2005. The Local Nature Reserve also has a separate designation as a Wildlife Site and Local Nature Reserve.

Nature conservation continues to be an important part of DCC's Environmental Policy and is reflected in the management priorities set for the Nature Reserve. In addition, the reserve provides a public amenity. Within the plan consideration is given to recreation and access opportunities, including education, which ranges from supporting clubs and school groups, to encouraging active involvement from local communities.

1.2 Site Details

Table 1.0

Site Name:	DCC Elvaston Castle LNR
Wildlife Trust Site Code	SD247
Address	Borrowash Road, Derby DE72 3EP
Area:	13.5 hectares
Grid Ref: (centre of reserve)	440224, 333186
Unitary Authority	Derbyshire County Council
Parliamentary Authority	South Derbyshire
Others with Legal Interests	Derby City Council
Size of Site	13.5 Hectares
Geographical Context	4 miles south east of Derby
Conservation Status	Local Nature Reserve /Wildlife Site
Bylaws	No dogs, No cycles, No Fishing
Access/PROW	Permissive Footpath. Kissing Gate entrance point.

1.3 Site Description

The site is a mix of various native and non-native woodlands and wet habitats.

Although the site and its habitats are relatively young, there remain a significant number of veteran trees within the LNR associated with the original historic parkland. These trees play a key role in the biodiversity of the site, providing variation in canopy heights and densities. This structure aids the development of other habitats such as woodland flora within the reserve and beyond. The topography of the site is relatively consistent, with only a few small mounds and ditches providing seasonal water holes. The site contains a good size lake, with several islands providing safe nesting areas for a variety of birds including a number of *Alcedo atthis* (*King Fishers*).

The reed bed, considered one of the largest in South Derbyshire, is an important example of a wet habitat within the reserve.

A large open area of unimproved grassland (Gretricks Field) is well placed to the rear and North side of the reserve. It contains a rich assortment of young fruiting trees and is currently managed as a living bird table for winter birds. **Table 1.1** lists the key features within the LNR and their significance for flora and fauna.

Geologically the reserve soil is predominantly clay, with a gravel layer approximately two feet below the surface. The regional average temperature varies and can be viewed in **table 1.2**. The temperature varies throughout the reserve, ranging by two or three degrees between the north and west side. This is due to shading from trees, together with the surrounding steep banks and water bodies creating a bowl effect.

Although the site and its habitats are relatively young there remain a significant number of veteran trees within the LNR associated with the original historic parkland. These trees play a key role in the biodiversity of the site, providing woodland with a good age variation. This aids the development of other habitats within the reserve and beyond. Excavation of the lake began in the mid 80's. There was little in regard of archaeological value discovered other than a pair of Red Deer (*Cervus elaphus*) antlers potentially indicating the species were naturally grazing here or put here as part of a game reserve.

An important example of a wet habitat within the reserve is the reed bed, containing what has been considered one of the largest Reed Warbler (*Acrocephalus scirpaceus*) colonies in South Derbyshire.

Table 1.1

Feature <i>Associated Figures</i>	Significance for flora and fauna
Lake <i>Fig 0</i>	15940.59sqm of open water habitat used by Kingfishers, Herons, Swans, Coots, Moorhens and several common fish species such as Pike, Roach, Chubb, and Rudd App. 6 species table 6.3). <i>Depth up-to 1.5m</i>
Islands <i>Fig 0</i>	Each provides a varied and distinct assortment of shrubs and trees. The islands are unique in shape, size and topography, supporting a range of ground flora. Management of the islands has increased their floral diversity and potential nesting sites.
Reed Beds <i>Fig 7</i>	One of Derbyshire's key BAP habitats. The beds cover 2819sqm which provide ideal nesting and breeding locations for birds, amphibians and reptiles. The reed bed potentially has one of the largest Reed Warbler populations in south Derbyshire but also supports the Reed Bunting and Sedge Warbler.
Waterfall Area and fast flowing streams <i>Fig 6</i>	A highly oxygenated environment providing ideal conditions for fresh water invertebrates and snails. The waterfall area is located within a sunny and sheltered section, creating ideal basking opportunities for grass snakes and an ideal hunting ground for Dragonflies Damselflies. Marsh Marigolds provide valuable nectar for insects.
Channels <i>Fig 0</i>	Fed by the river Derwent and encircling the reserve beneath steep banks these channels provide protection from poachers. The streams, although slow running do maintain a steady supply of moving water into the lake maintaining water levels throughout the seasons.
The Newt Pond <i>Fig 6</i>	Separated from the lake by a footpath, the Newt Pond provides still water with warmer conditions more suited to amphibians and insect larvae e.g. Dragon and Damselfly. The area surrounding the Newt pond provides ideal wetland conditions (refer to appendix: pond dipping results figure 5.3a)
Wetlands <i>Fig 5</i>	A matrix of wetlands and wet woodlands can be found throughout the reserve, which support a wide range of flora and fauna e.g. Marsh Marigolds, reptiles and amphibians.
Pollard and standing dead wood <i>Fig 6</i>	Significant to invertebrates and mammals alike, standing dead wood is now recognised for supporting high biodiversity levels. The intention is to preserve standing dead wood wherever possible, except where it may cause a significant health and safety risk. Thorough surveys prior to, during and following work are essential (e.g. bats, nesting birds etc.)
Young and old woodland <i>Fig 3</i>	Due to the sites historic significance there are a variety of historically planted veteran trees, planted as part of the 4 th Earl's (Charles) vision. Native species were subsequently planted as part of the first Nature Reserve Management Plan (1989) and have become well established. Self-sets have arisen requiring thinning. However, if managed well this provides an opportunity to enrich the woodlands diversity and to develop greater variation in canopy levels.

<p>Mature Trees</p> <p><i>Fig 3</i></p>	<p>Sheltering newly planted shrubs and trees, the mature trees on the LNR help protect areas from gusts of wind and allow the weaker root systems of neighbouring trees to develop. Decayed limbs and rotten stumps have created obvious opportunities for bats and woodpeckers and host 1000's of organisms.</p>
<p>Hedges</p> <p><i>Fig 4</i></p>	<p>Hedges historically have marked old field boundaries and today help to provide an obvious and secure boundary for the LNR. The hedgerows provide clear wildlife corridors connecting the reserve to the estate, surrounding fields, woodlands and neighbouring countryside.</p>
<p>Gretricks Field</p> <p><i>Fig 1 & Fig 1.1</i></p>	<p>2.1 hectares of open grassland encircled by woodlands and fruiting trees. Gretricks Field provides its own microclimate and the grass meadow is sheltered by banks which create a habitat suitable for snakes to bask. The unimproved grassland provides an opportunity to further develop the existing living bird table, intended to increase the food supply for native winter birds and provide seeds for small mammals. The latter provides a food source for raptors already heavily associated with this meadow and surrounding fields.</p>
<p>The Scrape</p> <p><i>Fig 2</i></p>	<p>The scrape was developed to provide a wading habitat for migrating birds, thus encouraging them onto Gretricks. The water body is around 3633sqm. The water levels here are unfortunately too deep to provide appropriate habitat for wading birds. Plans are in place to adjust the water levels feeding the scrape to provide more suitable conditions for waders, damselflies and dragonflies. Controlling the spread of the reeds will be fundamental to providing the optimum conditions.</p>

Table 1.2

	Maximum	Minimum
Derby weather in January	7°C / 45°F	0°C / 32°F
Derby weather in February	8°C / 46°F	0°C / 32°F
Derby weather in March	9°C / 48°F	1°C / 34°F
Derby weather in April	12°C / 54°F	3°C / 37°F
Derby weather in May	16°C / 61°F	6°C / 43°F
Derby weather in June	19°C / 66°F	9°C / 48°F
Derby weather in July	22°C / 72°F	11°C / 52°F
Derby weather in August	21°C / 70°F	11°C / 52°F
Derby weather in September	18°C / 64°F	8°C / 46°F
Derby weather in October	15°C / 59°F	6°C / 43°F
Derby weather in November	10°C / 50°F	3°C / 37°F
Derby weather in December	7°C / 45°F	1°C / 34°F

1.3.1 Previous Management history

The first management plan was written in 1989 by DCC Countryside Service staff to coincide with the sites designation, and was subsequently delivered by them. The management plan provided a guide to addressing practical access issues, conservation management and the development of new wildlife habitats.

The level of reserve management was gradually reduced from 2000-2008 as Derbyshire County Council underwent changes in policy and direction. During this time (2007) a project was initiated to develop a group of conservation volunteers that would support the long term management of the reserve. A group is now well established and continues to strongly support the LNR in partnership with DCC.

In 2008 a re-focus led to the development of a two year action plan aimed at raising public awareness of the LNR and revising the original planned vision. In 2009 a Nature Reserve Open Day was held and a new entrance/ interpretation board was installed (**App.8, Figure 8.2**) to showcase the open day and re-launch the Nature Reserve to a new audience.

In 2011 a revised management plan was drawn up to better reflect current DCC objectives and strategies, as well as better manage the LNR in its existing form. Greater emphasis was placed on council BAP targets, public awareness and volunteer involvement– encouraging ownership and greater understanding of its value.

Since the 2011 revision old infrastructure such as Little Oak Bridge have been replaced and management of Gretricks Field, with the support of volunteers, has seen it progress from an unimproved to semi improved grass meadow. Access to new habitats such as the waterfall area has been created together with hibernacula on at the north side of Gretricks Field (**App.5.1, Figure 0**).

1.4 Site Use

The LNR was originally accessible to permit holders only. In the late 90's access was opened up to everyone, with the exception of motorised vehicles, bicycles, horses and dogs. There are some limitations to access for those who are less able bodied, due to the nature of the site. Whilst wheelchair access is possible via the entrance gate, we do not recommend this all year round due to ground conditions and suggest caution is taken when making the decision whether or not to enter.

From 2015 using technologically advanced equipment it has been possible for the first time to measure visitor numbers. This has revealed the site is visited on average by at least 12,200 people annually refer to **(App.10 Figure 10.1)**.

There are no toilets on the LNR. The nearest facilities are located within the cobbled courtyard, Castle building and main car park. The site predominantly attracts bird and wildlife watchers, although many people simply visit the LNR for 'peace and quiet'. The range of interests from groups, families and individuals has increased as the LNR habitats have developed and access improved. Scouts, orienteering and natural history groups all visit; many carrying out activities ranging from educational to survey work. Volunteering is central to the reserve's management and the number of individuals involved in its long term management reflects its value within the community.

The LNR does not suffer from excessive vandalism. However, to minimise levels a number of measures have been taken. These include opening up the backs of bird hides to reduce privacy and the likelihood of arson. The thinning of dense shrubs has reduced the number of blind spots around the reserve; increasing visibility and improving visitor perception of safety.

There has been investment in high quality vandal-resistant, interpretation boards, **(App.8 Figure 8.3)** and by encouraging access to all it has reduced the likelihood of groups or individuals causing damage. The site has also benefitted from an increased and regular staff and volunteer presence.

In 2013 a site map and leaflet was made available to visitors. **(App.8 Figure 8.1)**

1.4.1 Events and interpretation

Events and interpretation are delivered in conjunction with the Countryside Service staff.

At the entrance to the LNR there is a site map and location board. In addition there are four fixed interpretation boards located within the LNR, which can be seen in appendix 8 as below:

- Fig 8.3: Reed Bed Panel
- Fig 8.4: Newt Pond Panel
- Fig 8.5: Wet Woodland Panel
- Fig 8.7: Gretricks Field Panel

These boards provide information on the habitats within which they are located and incorporate an interchangeable 'notice' board to highlight particular events, sightings, activity on the reserve. A short way in from the entrance to the reserve there is a notice board designed to provide regular updates and information to visitors.

1.5 Site Resources

Since 2012, the LNR has been supported by a staff of three Rangers, two wardens and four part time (weekend) Rangers. However, their roles include the wider management of the Elvaston estate and visitor offer, together with other off-site tasks. As a result the amount of time available to manage the reserve is, of necessity, limited.

Volunteers are essential to the long term management of the LNR and in 2011-2012 an average of 12-26 individuals supported the LNR by attending fortnightly conservation tasks. The LNR does not have a dedicated and separate budget, resources such as the use of the Tractor, flail, fuel, hand-tools, PPE and chainsaws coming from the wider estate budget.

A constituted Elvaston Reserve Action group (ERAG) was formed in early 2013 (a splinter group from the conservation volunteers) with a focus on promoting and fund raising for the LNR; whilst assisting with the management and interpretation of the LNR to a wider audience. A copy of their constitution can be found in the **(App.9, Figure 9.3)** along with details of their accomplishments to date.

Future funding opportunities are likely to become more accessible through groups such as this.

1.6 Compartment Details

None

PART 2

Evaluation and Management Proposals

2.1 Site Evaluation

The site is used predominantly by wildlife enthusiasts and walkers who have varying interests in wildlife and the outdoors. In 2011 Elvaston was estimated as having over 20,000 visitors each week during April and 24,000 during an average week in August. Of this number, around 5% come to visit the reserve, maintaining its peaceful atmosphere **(App.10 Figure 10.1)**.

One of the most important habitats within the LNR is the Reed Beds. This is a priority BAP habitat, consisting of around 1935.25sqm or 0.193525 Hectares. Grass Snakes have been recorded and it has been suggested that Great Crested Newts may potentially be present.

Reed Bunting, Warblers, and Water Rail, which are globally at risk, care also associated with the reed beds and wetlands around the estate **(App. 6 Figure 6.3)**.

The estate achieved Green Flag status in 2013 and has maintained it for two successive years to date. This management plan will be referenced within the wider estate management plan.

2.2 Site Management Outcomes

2.2.1 Biodiversity:

Outcome 1

- **To enhance and preserve biodiversity, aiming to increase the sites protective status and reflect its local importance.**
- Develop the living bird table on a bi-yearly rotational plan using a rich seed mixture to support a winter bird population and increase the population and diversity of small mammals. Populations of Chaffinches have seen a major increase in this area and are currently being recorded by The Royal Society for the Protection of Birds (RSPB).
- Collect and collate annual insect species information to help identify increases in fauna and to pinpoint any significantly local rare species such as the mimic hornet *Volucella zonaria* (*Belted Hoverfly*).

Outcome 2

- **To increase biodiversity through adoption of appropriate management practices where possible, to enhance the habitats of e.g., Grass Snakes, Great Crested Newts, the Essex Skipper Butterfly, the Small Red Eyed Damselfly, Water Voles, Harvest Mice and Otters.**
- Develop a yearly reed cutting program to enhance the structure of the habitat for nesting and measure the population growth of reed wildlife; specifically the Reed Bunting, Reed Warblers and Sedge Warblers.
- Replant Hazel and Gelder Rose where appropriate, to proactively encourage small mammals. Seasonal surveys to be carried out by an ecologist (**App. 6 Figure 6.3**).
- Enhance habitats such as the woodlands, surveying fauna to assess the impact of the management practices over the life of the management plan.
- Take measures to remove Mink from the site thereby encouraging the re-colonisation of otters within the surrounding area (supported by the Lowland Derbyshire Biodiversity Action Plan).
- Continue collating Grass Snake sightings and pass on to the Derbyshire protected species database. Correlate snake sightings across the estate to pinpoint the probable location of nests and manage these areas sensitively to develop or enhance associated habitats.

• **2.2.2 Providing Access for all**

Keep paths well maintained and relatively mud free where possible, using recycled woodchips from annual woodland thinning. Future outcomes to include provision of alternative surfacing in targeted areas, to increase access for all. The tramper (mobility scooter) route does not extend into the LNR and is not recommended due to the ground conditions and unguarded paths close to water.

Outcome 1

- **To raise local / national awareness of the LNR and provide appropriate opportunities for school trips and training days. Develop habitat interpretation highlighting its significance.**
- Deliver educational events focussing on the management of an LNR, including the various conservation principles and practices involved.
- Involve local communities through the bi-monthly volunteer program and events, encouraging groups and individuals to play an active role in implementation of projects on site.

Outcome 2

- **To install new bridges where appropriate and rebuild damaged hides using vandal resistant materials. Develop and install site specific way marks with the support of volunteers.**
- Infrastructure, including site structures and furniture, is to be visually evaluated a minimum of quarterly.
- Appropriate actions are taken if repairs or maintenance is required (**App.7, table. 7.3**).
- Plans for any replacements are to be drawn up a year in advance to allow sufficient time for funding to be sourced.

Outcome 3

- **To improve the waterways**
- Increase the fresh flow of water into the reserve, aerating the lakes and improving the water quality.
- Check and remove any obstructions to allow Swans and Otters to traverse between the main lake and the LNR.
- Dredge the lakes and dispose of silt when funding and grants can be applied for.
- Investigate the construction and management of silt traps to reduce the amount of silt deposited within the LNR and the wider parkland.

Outcome 4

- **To become self-sufficient, aiming to use natural materials recycled or reused from site wherever possible.**
- Wherever possible, repair furniture or build new structures using materials taken from the site e.g. using timber from coppicing and felling programmes.
- Continue to use rustic fencing to subtly guide the public around the site, discouraging people from wandering into fragile areas.

In summary:

A Management Plan provides a clear structure to guide managers on the maintenance and improvement of habitats for flora and fauna.

The identification of clear time frames for work is essential, with much of the work only possible seasonally due to habitat, nesting and wildlife vulnerability e.g. Reed bed management. Flora and fauna surveys remain important indicators when monitoring biodiversity changes. External support for completing such surveys is necessary.

2.3 Constraints on achieving ideal management outcomes

- Wider site obligations unavoidably impact on staff capacity to manage the LNR, with priority given to the Grade 2* gardens and estate.
- Off-site commitments reduce on-site staff capacity to deliver against the LNR management plan
- There is no set budget for management of the reserve or supporting volunteers
- Environmental issues such as pollutants and silt entering the site via external waterways, which feed into it.
- Landscape and Geology: Heavy clay makes drainage difficult, despite a gravel bed two feet below the surface. This has implications for habitat development and wildlife.
- Climate change has the potential to seriously impact upon flora and fauna, particularly in relation to ground water levels. Veteran trees are under increasing threat. Impact of visitors: potential for vandalism and arson, resulting in the damage or destruction of infrastructure and habitats.
- Potential future changes in Countryside Services staff structure, particularly any reduction in staffing levels, could negatively impact on capacity to deliver against objectives with volunteers.

2.4 Site Management Aims and Objectives

The following section is an overview of the sites aims and objectives to benefit wildlife and public access and interpretation.

Aim One: To enhance and preserve biodiversity

- Man. Obj 1.1** Develop a flower meadow management rota
- Man. Obj 1.1a** Develop Gretricks into Wild Grass Meadow
- Man. Obj 1.2** Enhance the reed beds and develop a management rota
- Man. Obj 1.3** Develop a woodland thinning program and control self-sets and record actions taken to create mosaic habitat and provide coppicing opportunities for materials on ongoing projects
- Man. Obj 1.3a** Begin removing sycamores and woodland thinning program in the wetland ready for willow plantation proposal
- Man. Obj 1.3b** Review the safety of standing dead wood and manage when necessary
- Man. Obj 1.4** Create a management rota for the wetland habitats and the Newt pond in accordance with the development of a willow plantation
- Man. Obj 1.5** Island Clearances and create a replanting program
- Man. Obj 1.6** Invasive species control
- Man. Obj 1.7** Develop a tree planting scheme
- Man. Obj 1.9** Hedge-laying
- Man. Obj 1.10** Surveys to be carried out annually
- Man. Obj 1.11** Create opportunities and appropriate conditions for the snake egg incubation
- Man. Obj 1.12** Manage the site sensitively, up keeping responsibilities to protect potential veteran trees
- Man. Obj 1.13** Manage Rhododendron, removal and replantation hedgerows and native trees
- Man. Obj 1.14** Plant Hedges and Beat up hedgerows
- Man. Obj 1.15** Commemorative Tree Planting
- Man. Obj 1.16** Re-level Scrape on Gretricks
- Man. Obj 1.17** Create and enhance King Fisher habitats
- Man. Obj 1.18** Develop natural or artificial habitats for Wildlife

Aim Two: To improve access for all

- Man. Obj 2.1** Improve the conditions of the footpaths
- Man. Obj 2.2** Facilitate better disabled access
- Man. Obj 2.3** Provide alternative communication methods
- Man. Obj 2.4** Replace current signage and provide interpretation
- Man. Obj 2.5** Plant up Snake Willow Sculpture

Aim Three: To Raise awareness and provide educational opportunities

Man. Obj 3.1 Provide various permanent and regularly revise
Non-permanent interpretation

Man. Obj 3.1a Develop a leaflet to enhance the sites prestige

Man. Obj 3.1b Provide signage and Nature Trail way marks

Man. Obj 3.2 Facilitate and encourage educational parties

Man. Obj 3.3 Record and publicise recording from completed surveys

Man. Obj 3.3a Continue running the volunteer program alongside projects

Man. Obj 3.4 Publicise events through the Derbyshire County Council's events
program

Man. Obj 3.5 Encourage corporate organisations and local groups to be actively
involved with the Nature Reserve and its management, promoting its significance
locally

Aim Four: Facilities for public use

Man. Obj 4.1 Maintain and replace furniture when necessary

Man. Obj 4.2 Renovate and replace defective bird screens

Man. Obj 4.3 Remove Dangerous Lime Tree

Man. Obj 4.4 Prune Trees at Swan Hide

Man. Obj 4.5 Anti-slip Bridges and Boardwalk

Aim Five: Maintenance and improvement of sites waterways and fresh water flow

Man. Obj 5.1 Water way maintenance

Man. Obj 5.2 Silt excavation

Man. Obj 5.3 Waterfall area

Man. Obj 5.4 Newt Pond

Aim Six: Manage the site effectively and innovatively

Man. Obj 6.1 Recycle materials from projects when possible

Man. Obj 6.2 Apply for grants and funding to support larger projects SUPPORT
GROUPS

Man. Obj 6.3 Record expenditure to better evaluate funding and the sites
running and maintenance cost

Man. Obj 6.4 Work alongside the Conservation Volunteers, and corporates and
help to develop the sites first constituted group Elvaston Reserve Action Group
(ERAG)

Man. Obj 6.5 Review Management Plan

2.5 Main Management Actions

Ideal Management Outcomes	Constraints on Achieving ideal	Aim	Objectives	Main Actions
<p>To enhance and preserve biodiversity</p> <p>To increase biodiversity and to include management practices to enhance the habitats of Grass Snakes, the Essex Skipper Butterfly, the Small Red Eyed Damselfly, Water Voles, Harvest Mice and aid the re-colonisation of Otters.</p>	<p>Funding, time and staff availability. Site and ROW priorities. Recreation and conservation balance.</p>	<p>To enhance and preserve biodiversity</p>	<p>1.1 Develop a flower meadow management rota. Refer to (App. 5.1, Map. 1.1) and work plans.</p> <p>1.2 Enhance the reed bed 2011 1.2a Fence off reed bed during nesting seasons (App. 7 Figure 7.1) Commence work on sluice and begin cutting. See reed bed management Refer to Sluice (App. 5.1, Map 2)</p> <p>1.3 Maintain woodland management program (App. 5.1, Map 3)</p>	<p>1.1.1 Mowing rotation of existing grassland 1.1.1a Ploughing heavy unimproved areas. 1.1.1b Scarify earth ready for reseeding late spring. 1.1.1c Floral surveys to record and compare before and after project.</p> <p>1.2.1 Undergo reed bed management training and seek advice regarding type of work and when to conduct. 1.2.1a Once water levels have been measured throughout the various lakes begin work to construct sluice and adjust water levels 1.2.1b Begin cutting and develop open channels.</p> <p>1.3.1 Thin out woodlands around lakeside using volunteers to coppice ash for hedge laying stakes, and use for fencing rails. 1.3.1a Replant areas using volunteers to diversify the native woodlands and encourage a varied range of canopies.</p>

			<p>1.4 Wetland habitat and Newt pond monitoring and work program (App. 6, doc 6.1)</p>	<p>1.4.1 Record and monitor results from surveys to provide. Use information to correlate resulting actions from site management.</p> <p>1.4.1a Using volunteers hand pick area of balsam and continue to thin out encroachment.</p> <p>1.4.1b Clear pond of logs and surface leaf matter. Using staff or volunteers remove duckweed if numbers become excessive.</p> <p>1.4.1c Maintain and enhance the hide overlooking the wetland</p>
			<p>1.5 Island work</p>	<p>1.5.1 Using volunteers continue thinning program selecting self-sets and suckering stems.</p> <p>1.5.1a Begin plans to replant using fruiting and nut trees providing food source for birds and mammals.</p>
			<p>1.6 Invasive species control</p> <p>(App. 5.1 Figure 3a)</p>	<p>1.6.1 Using manpower from volunteers and selected events provide a program to hand pick balsam annually prioritising areas by site sensitivity and reducing the spread of the plant to uncontaminated areas.</p> <p>1.6.1a Thin out Rhododendrons in selected areas using hand tools and volunteers. Clear roots and prepare for replanting providing varied canopies for</p>

<p>Providing Access for all</p>	<p>Funding/Manpower and Time</p>	<p>To enhance Biodiversity</p>	<p>1.7 Tree planting rota</p> <p>1.9 Hedgelaying</p> <p>1.10 Surveys to be carried out annually (App. 6 Figure 6.3)</p> <p>1.11 Create opportunities and appropriate conditions for the snake egg incubation</p> <p>1.12 Sand Martin Bank Creation</p>	<p>nesting and cover before clearing the next area.</p> <p>1.6.1b Control and trap Mink particularly around nesting season</p> <p>1.7.1 Develop a rota and map outlining areas to be planted to provide either shelter or food source. 1.7.1a Provide a nursery to be managed by Rangers over a 2 year cycle. 1.7.1b Plant trees in selected areas during the autumnal or early spring months.</p> <p>1.9.1 Continue to maintain the hedge on river banks laying and beat up when necessary.</p> <p>Surveys regarding delicate habitats are to be carried out annually.</p> <p>Transport manure to reserve at the end of winter to provide ideal warm conditions for eggs to incubate. When removing grass from Gretricks use selected spots to drop grass cuttings allowing decomposition. During reed bed management make piles of cut reeds; also rotting and providing heat in the process to aid egg incubation.</p> <p>Utilising corporate events fund and develop project</p>
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	Funding	Improve conditions of the footpaths	<p>2.1 Footpath resurfacing and maintenance</p> <p>2.2 Provide better access for wheel chair users 2013</p> <p>2.3 Provide alternative communication methods</p>	<p>2.1.1 Improve drainage; resurface using woodchips and raising paths in boggy areas.</p> <p>2.2.1 Kissing gate to be altered to allow easier access for mobility scooters</p> <p>2.3.1 Audio tours supplied by staff or by a cell phone number. 2.3.1a Brail supplied for the interpretation on entrance or by a map/leaflet. 2.3.1b Way marks marking to be raised</p>
<p>To raise national awareness and provide opportunities for school trips and training days. Have interpretation explaining each habitat and its significance to wildlife and ourselves</p>	Funding Amount of man hours required	Raise awareness and provide educational opportunities.	<p>3.1 Provide various permanent and regularly revise non-permanent interpretation regarding habitats 2013 (App. 8, Figure 8.1-8.5)</p>	<p>3.1.1 Provide a seasonal entrance board informing and educating the public of various activities and project within the reserve. 3.1.1a Develop temporary interpretation for the flower meadow and living bird table.</p> <p>3.1.1b Include a leaflet for sale in the shop 3.1.1c Integrate the nature reserve into the sites website having information and downloadable content available for free.</p> <p>3.1.1d Replace temporary way-marking with appropriate directional signage</p>

<p>Purchase new bridges and rebuild damaged hides using vandal proof structures. Correct waymarks to be used specific to the site.</p>	<p>Time</p>	<p>Support the graduate and collect information to better understand the cost and environmental implications of silt extractions from both the LNR and wider site.</p>	<p>3.2 Facilitate and encourage educational parties</p> <p>3.2a Work alongside a graduate to discover the composition and depth of silt within the waterways of the LNR</p>	<p>3.2.1 Provide staff paid to facilitate guided walks</p> <p>3.2.1a Encourage and re-advertise school parties</p> <p>3.2.1b Corporate training days made available requiring staff training.</p> <p>3.2a</p> <ol style="list-style-type: none"> 1. Begin by measuring silt depth at various location 2. Take samples from various locations for analysis within the laboratory 3. Record data
	<p>Time</p>	<p>Support the graduate to enhance our global understanding of the grass snakes lifestyle</p>	<p>3.2b Work alongside a second graduate to pioneer new research into the behavioural habits population dispersal of Matrix matrix</p>	
	<p>Funding</p>	<p>Provide structures' for public recreation and enjoyment</p>	<p>3.3 Continue running the volunteer program alongside projects. (App. 8, Figure 8.3)</p> <p>3.5 Corporate and Teambuilding (App. 9, Figure 9.2)</p>	<p>3.3.1 Create an annual and regular volunteer program to be run inside the reserve</p> <p>Encourage groups to be actively involved and source funding through these team building activates</p>

<p>Become completely self-sufficient using only the most natural materials where possible and efficiently recycle and reuse as much as possible.</p> <p>Renovate the waterways and increase the fresh flow of water into the reserve aerating the lakes and increasing the quality of the water. Dredge the lakes and dispose of silt.</p>		<p>Maintenance and improvement of sites waterways and fresh water flow</p> <p>Manage the site effectively and innovatively</p>	<p>4.1 Maintain and replace furniture when necessary 2014</p> <p>4.2 Repair or replace defective bird screens</p> <p>5.1 Water way maintenance</p> <p>5.2 Dredge Streams 2015</p> <p>5.3 Waterfall area</p> <p>6.1 Recycle materials from projects when possible</p>	<p>4.1.1 Repair and provide more seating when necessary using staff and volunteers</p> <p>4.1.1a Replace bridges to be included as part of a project</p> <p>4.2.1 Replace defective bird hides and replace with less vulnerable materials.</p> <p>5.1.1 Clear streams using volunteers and staff. Clear sedges and rushes to allow water flow, and clear of logs and any bridges kids</p> <p>5.2.1 Dredge streams, and then ultimately the lake to prolong the life of the waterways and restore to original depths</p> <p>5.3.1 Balsam pick and encourage natural spread of wild plants including Marsh Marigold, Wild Garlic and Yellow Iris. Monitor erosion of banks and fit supports where necessary. Clear silt and increase depth if possible from waterfall.</p> <p>6.1.1 Recycle all materials for example woodland thinning, timber used for rails and post providing rustic fencing.</p> <p>6.1.1a Brash to be chipped and chipping to be used to fill holes and cover paths.</p> <p>6.1.1b Seeds to be used for park planting and replanting within the reserve.</p>
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<p>Work alongside the conservation volunteers and guide them in developing ERAG</p>	<p>Develop a constituted group and workforce to help manage the Nature Reserve</p>		<p>6.2 Apply for grants and funding to support larger projects</p> <p>6.3 Record expenditure to better evaluate funding and the sites running and maintenance cost</p> <p>6.4 Advise on committee member responsibility and group infrastructure</p>	<p>6.1.1c Timber to be sold for fire wood or decorative materials year round to provide income for tools and projects.</p> <p>6.2.1 Apply for conservation grants such as BIFFA and help instigate some of the larger projects out of reach for the sites budget.</p> <p>6.3 Produce a running table showing expenditure and provide an estimate for the next 5 years. Staff and volunteer hours will be included</p> <p>6.4 Hold meetings and act as the council's representative to the group in an advisory role. Meeting help Monthly until group is constituted</p>
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PART 3 – Management Actions

This section is the heart of the active management plan. This and the attached figures and maps are the guides that will enable individuals to follow the work load in a structured and logical manor taking into account the most appropriate seasons for the work to be initiated on. See **(App. 5.1, Maps 0-7)** for maps of habitats, and **(App. 5.2, figures 5.2a-5.2f)** for work plans.

Annual Work Plan				
Management Actions (ref no)	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
1.1 Restore Grassland and enhance with species rich seeds	October 2015	Reserve Manager	Non Seed provided by area manager	October 2015 Site manager and Volunteers
1.3 Control Self sets where necessary	Early Spring	Ranger/ Warden	Non	Staff Volunteers
1.3b Review the safety of standing dead wood and manage when necessary	Winter	Nature Reserve Manager	Non	Staff
1.4 Manage and survey Newt Pond	Spring	Ranger/ Warden/ Volunteers	Non	May-June Volunteers and Staff
1.1.1 Mow and strim footpaths and cut and collect grass from Gretricks in October	Summer and Autumn	Ranger/ Warden (Tractor Driver)	Fuel and time only	June-October
6.3 Manage Waterfall area	Before seeding	Ranger/ Warden Volunteers	Non	April-July
1.6 Himalayan Balsam pulling	Before seeding	Volunteers	Non	June-July Volunteers and Staff
1.6.1c Mink Control	Spring to coincide with Reed Bed path closure	Pest Control Officer	Non	March-July Reed Bed
1.3 Maintain woodland management program	Autumn to Winter	Ranger/ Warden	Non	November-January
1.3 Enhance the Reed Bed See reed bed management	September	Nature Reserve Manager	Non	Staff

1.2a	Fence off Reed Bed (App.7 Figure 7.1)	Staff/ Volunteer s	Non	Annually path closed from end of march till end of June/July
1.9 Hedge laying	Winter	Ranger/ Warden	Non	Staff Volunteers
Year 1 (2016)				
Management Actions (ref no)	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
2.1 Footpath resurfacing and maintenance	Spring/Summer Ongoing	Ranger/Warden	Fuel, pea gravel £30.00 per tonne	April Staff
3.1 Provide various non-permanent interpretation and regularly revise	Spring and Summer	Nature Reserve Manager/ Interpretation Manager	Maximum of 8 pages to print using office tools	Interpretation regarding Gretricks Staff
6.1 Water Way Management	Summer	Ranger/Warden	Non	May-June Volunteers and Staff
1.7 Tree planting rota	Autumn-Spring	Ranger/Warden	Non supplied by area manager	October/November/February March (avoiding frosts) Staff and Volunteers
1.3 Tree Thinning around scrape Large Willows and Ash.	Autumn Winter	Ranger/Warden	Non	
1.3a Begin removing sycamores and woodland thinning program.	Autumn Winter	Ranger/Warden	Non	Staff
3.2 Facilitate and encourage educational parties	Ongoing (School parties and pond dipping)	Nature Reserve Manager/ Events Ranger	Non	Staff
3.2a Work alongside a graduate to discover the composition and depth of	2015-2016	Nature Reserve Manager/	Non	Staff

the silt within the LNR				
4.2 Repair Defective Bird Screens	Ongoing	Ranger/Warden	Non	Staff
1.1 Enhance grass meadow on Gretricks field. Incorporate at least two areas for flowering flora.	2016-2017	Ranger/Volunteers	Non	Staff
1.12 Develop Sand Martin Bank	2016-2017	Ranger/Rolls Royce/Volunteers/Community Groups/Notts Wildlife Trust	£1200 Funded by Corporate donations and ERAG	Staff
1.5 Island work	Autumn/Winter or Early Spring	Ranger/Warden	Non	Staff Volunteers
1.10 Surveys to be carried out annually	Spring/Autumn	Ranger/Warden/Volunteers	Non	RSPB, DWT, Long Eaton Natural History Society Staff and Volunteers
1.11 Create opportunities and appropriate conditions for natural hibernacula's	End of winter/ End of summer	Nature Reserve Manager	Non	Staff
Photos	Ongoing	Ranger/Warden Volunteers	Non	Staff
2.1 Check conditions of the footpaths, including safety checks of gates, bridges and furniture's.	Weekly	Nature Reserve Manager	Non	Staff
3.5 Lease with Corporates and Team Building	Ongoing	Ranger	Non/Funding opportunity	Reserve Manager

Year 2 (2017)				
Management Actions	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
1.2 Enhance the reed bed See reed bed management Detailed Management Actions.	Winter	Nature Reserve Manager	Non	Staff
4.2 Repair or replace defective bird screens	Summer	Ranger/Warden	Unknown / Gregory's	Staff
3.1.1d Replace temporary way-marking with appropriate directional signage	Summer	Nature Reserve Manager/ Interpretation Ranger	Unknown	Staff
7.2 Apply for grants and funding to support larger projects	Spring	Nature Reserve Manager/ Area Manager	Unknown / Gregory's	Staff
1.3 Tree Thinning around waterways to encourage hedge growth	Autumn	Ranger/Warden	Non	Staff
3.2b Work alongside a second graduate to pioneer new research into the behavioural habits population dispersal of Natrix natrix	Summer	Reserve Manager	Non	
Year 3 (2018)				
Management Actions	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
2.2 Provide better access for wheel chair users	Summer	Nature Reserve Manager	Non / Already Sourced	Staff
2.3 Provide alternative	Summer	Nature Reserve	Grants	Staff

communication methods		Manager/ Interpretation Ranger		
3.1 Provide various permanent and regularly revise non-permanent interpretation regarding habitats	Summer	Nature Reserve Manager/ Interpretation Ranger	Grants	Staff
1.2.1a Begin construction of sluice	Winter	Nature Reserve Manager	Sourced from site	Staff
3.1 Sand Martin Bank Interpretation	Spring	Nature Reserve Manager	ERAG/Corporate donations?	Staff

Year 4 (2019)

Management Actions	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
4.1 Maintain and replace furniture when necessary	Summer	Ranger/Warden	None. Attained in 2013	Staff
1.4.1c Enhance and restore hide overlooking the wetland	Winter	Ranger/Warden	Non-Use natural resources from tree pruning	Staff
1.3 Thin out Woodlands on Reserve Boundaries	Winter/Ongoing	Ranger/Warden	Non	Staff

Five-Yearly (2020)

Management Actions	Target Date	Main Responsibility	Cost / Source	Action Taken (date / who)
6.5 Review and revise site management plan	2019	Nature Reserve Manager	None	Nature Reserve Manager
6.2 Dredge Streams	Autumn/Winter	Nature Reserve Manager	Grant Aid or DCC finances	Contractors
1.3 Woodland Flailing	Autumn/Winter	Ranger/Warden	None / Fuel	Staff

Detailed Program and Management Guidelines

SUGESTED METHODOLOGY

Man. Obj 1.2.1a Reed Bed Management Proposal and actions:

- Accurate water levels will be required in order to make sure the sluice between the reed bed and scrape would work and effectively control water levels within the reed bed.
- In order to control water levels within the reed bed, it has been proposed that we construct a channel and sluice between the scrape on Gretrick's and the reed bed.
- A second sluice will need to be place at the other end of the scrape near Little Oak Bridge.

For more information and detailed maps of the annual reed cutting and sapling thinning refer to **(App. 5.1 Map. 4.)**

Man. Obj 1.2.1b Reed Cutting:

Cutting will commence during late September- Mid October as to avoid nesting and winter feeding seasons.

- It is intended to cut the reeds to surface height creating 2 metre strips running east to west through the reed bed with further strips being cut running adjacent to this main strip.
- The cut channels will be angled to provide ideal viewing points from set viewing areas around the reed bed such as Rays Fort
- It has also been proposed that we create another bird hide positioned on the North face of the reed bed to provide another viewing angle.
- The Channels will also control the spread of the reed, and adjusting the angle each year will also help spur fresh young growth providing different swath heights and appealing to various diversities of aquatic and avian wildlife.
- Additional reed control will include cutting back some reeds that have expanded to enclose viewing points and in front of bird hides. These areas should be cut regularly to prevent further expansion.

Man. Obj 1.3 Develop a woodland thinning program and record the actions taken to create mosaic habitat and provide coppicing opportunities for materials for ongoing projects.

- Specific coppicing areas will be managed on rotation to provide a renewable source of materials for construction projects such as the repair of fencing and development of bird hides.
- All woodland work will commence during the winter months under the supervision of the Nature Reserve Manager. Work will not take place within nesting seasons apart from the coppicing of trees with a diameter of 2 inches or below for construction work, and only if it is clear there are nesting materials present.
- Flails to be used 1 in 3 years to clear a run within the wood and provide a vast and measurable increase in insects species within this habitat.

See appendix for woodland thinning and coppicing mosaic map (**App. 5.1, Map. 3**).

Man. Obj 1.1.1 Gretricks Develop improve grassland and manage wildflowers

Create a flower meadow to attract a greater diversity of nectar feeders including butterflies that seem to have a low diversity at the moment.

- Mow the field grass once a year, using a flail and grass collector during October at the earliest to avoid disturbing grass snakes and destroying small mammal habitats. Grass collected to be distributed at the edges of the field to act as refuge for small mammals and amphibians. The grass piles could also act as good nesting sites for next years spring and summer months.
- Maintain a strip of grass 7m by total length of field to provide shelter for any remaining active mammals. Position can be rotated yearly to provide fresh re-growth
- Flower meadow to be cut back lightly using just the flail during mid to late February, to distribute the remaining seed. Scarify the seeds to mix and bury under the soil.
- Replant using rotation pattern for year one or year two. See (**App. 5.1, Map. 1**).
- Manage existing trees and continue planting intermittent native trees providing cover and food for birds and small mammals

Having planted specific trees to provide both food in the form of nuts and seeds, nectar and fruit these trees should now be managed and replaced when necessary with appropriate trees able to provide a food source for birds, moths, butterflies, bees and small mammals. Structurally this would also provide safe perching areas for feeders on a Living Bird Table. Please see plan for further details on suggested locations. Refer to Managing Gretricks Field in work plans, and refer to map (**App. 5.1, Maps. 1.1**).

Man. Obj 6.3 Waterfall area

- Due to the destructive balsam root system attention to the banks must be assessed annually and erosion must be controlled and monitored annually.
- Marsh marigold is a returning visitor and seeds could be collected for replanting in various areas in the years to come.
- Controlling willow growth will be a key part of maintaining a low canopy essential for flight paths of small birds.
- Once the Balsam is under control a planting program of wild garlic will essentially help provide the missing nectar for butterflies and bees, and alongside the yellow flag iris and the areas damp conditions the damsel and dragonfly population will continue to flourish.

PART 4 –Monitoring and Review

For the Management Plan to remain effective it is essential that it remains current and appropriate, responsive to new opportunities and meeting the needs of the local community. In order to ensure that it does so, we will;

- Gather data from remote cameras to give a clear and undisputed record of an annual average number of visitors to the reserve. Data will be used to provide an indication of numbers of families and monitor if there is any and what kind of antisocial behaviour is present.
- Review completed actions ensuring objectives that have been completed have been assessed and if further action is required
- Continue to use surveys to both detect what species we have on site but also to monitor the impact on wildlife of any management actions we have taken such as scrub clearance and water pond clearance. These surveys will be collected and filed to be reviewed during the summer months helping us take further actions as part of the habitat management actions.
- Provide opportunities for the public and visitors to provide feedback regarding any changes they may have noticed in wildlife numbers and floral diversity. Staff and volunteers have already begun noting information from visitors by word of mouth. A questionnaire would provide a more thorough way of recording the data however past experienced proved to be unsuccessful. Information from now on can easily and freely be made accessible via the sites homepage under Derbyshire County Councils website and may inspire visitors to comment.
- Create a display board or a book for visitors to record anything they have seen. This was trialled before and was successful until the hides became the target of vandalism. Perhaps a blackboard attached to the Nature Reserve entrance or within one of the bird hides. Perhaps even the castle courtyard or the car park where it can be monitored by members of staff.
- Review the Management Plan annually and assess progress against the action plan, taking into account new possible management actions that could be implemented over the next four years. Removal of actions may also be necessary if it has become clear some actions could not be implemented successfully due to existing or new restraints. The review will take place during the summer months when work load is at its lowest and can be implemented in the winter months along with the rest of the work program.
- Continue to seek advice from experienced staff members and rota in team days for work on larger site projects.
- Consider changes to methodology and actions if changes are required when and if re-designation occurs.

Appendices and Maps

5.1 Site Maps and Habitats

- Figure 0: Site Overview
- Figure 1: Gretricks Field and Flower Meadow
- Figure 1.1 Gretricks Field Plan
- Figure 2: Sluice Proposal
- Figure 3: Woodland Management
- Figure 3a: Rhododendron Management
- Figure 4: Hazel Plantation and Hedge-laying
- Figure 5: Wet woodland
- Figure 6: Waterfall and Newt Pond
- Figure 7: Reed Bed
- Figure 7.1: Reed Bed Closure Sign *
- Figure 8: Gravel Path Location

5.2 Work Plans

- 5.2a: Annual work programme
- 5.2b: 2011 work programme
- 5.2c: 2012 work programme
- 5.2d: 2013 work programme
- 5.2e: 2014 work programme
- 5.2f: 2015 work programme
- 5.2g: Managing Gretricks Field

6.0 Site Fauna and Flora

- Figure 6.1: Aquatic Species List May 2010
- Figure 6.1a: Fresh Water Invert Survey 2012
- Figure 6.2: Snake Sightings Reserve
- Figure 6.2a: Snake Sightings Reserve
- Figure 6.3: Species Table
- Figure 6.3a: LNHS Survey 2015
- Figure 6.3a1: LNHS Survey 2015
- Figure 6.4: Dragonfly Survey Log *
- Figure 6.4a: Ordonata Case Study *
- Figure 6.5: Elvaston Castle LNR bird survey
- Figure 6.6: Island Fauna *
- Figure 6.7: Estate and Reserve Pond Surveys *
- Figure 6.8: Elvaston Bryophyte Survey *
- Figure 6.9: Ladybird Dissertation *

7.0 Structures

- 7.1: Structure schematics and dates of installation
- 7.2: Poachers Bridge
- 7.3: Sand Martin Bank

8.0 Interpretation

- 8.1: Nature Reserve Leaflet *
- 8.2: Nature Reserve Interpretation Board *
- 8.3: Reed Bed Panel *
- 8.4: Newt Pond Panel *
- 8.5: Wet Woodland Panel *
- 8.6: Waymarks *

9.0 Volunteers

- 9.1: Volunteer Tasks and Chronology *
- 9.2: Team Building and Corporate Tasks *
- 9.3: Elvaston Reserve Action Group Constitution *

10 Management History Records >2010

- 10.1 Average Visitor Figures 2015-2016