

# **Spa Ponds Nature Reserve Mansfield, Nottinghamshire**

## **Ecology Report and Management Plan**

**A report to:**

**Forest Town Nature  
Conservation Group**

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## **1. INTRODUCTION**

- 1.1 This report has been prepared by EMEC Ecology for the Forest Town Nature Conservation Group. It provides the details of an extended Phase-1 habitat survey and management plan for Spa Ponds Nature Reserve, Mansfield in Nottinghamshire.
- 1.2 The lease that the Nottinghamshire Wildlife Trust had with the landowner has recently ended. The site was put up for sale and the Forest Town Nature Conservation Group (FTNCG) were successful in purchasing the land. The FTNCG are to continue management of the reserve with support from the Nottinghamshire Wildlife Trust.
- 1.3 Spa Ponds is centred on grid reference SK 570 633; the location of the site is shown on Figure 1 in Appendix 1.
- 1.4 EMEC Ecology's brief was to undertake an extended Phase-1 habitat survey and provide a strategy for the ongoing management of the habitats present on site and the sites maintenance as a Nature Reserve.
- 1.5 A previous management plan was produced for Spa Ponds in April 1996 by the Nottinghamshire Wildlife Trust <sup>1</sup>.

## **2. SITE INFORMATION**

- 2.1 Spa Ponds covers an area of approximately 4.6ha and is situated immediately off Clipstone Drive, Forest Town, Mansfield. A public bridleway, Packman's Way, acts as the main footpath through the Reserve. Immediately west of the site is arable farmland, the east of the site is bordered by a conifer woodland, Garibaldi Plantation. The River Maun runs along the northern border of the Reserve. South of the reserve is a housing estate, part of the village of Clipstone.
- 2.2 The site currently comprises of broadleaved woodland, acidic grassland and four spring fed ponds. The northern half of the reserve including the four ponds and the surrounding woodland and acidic grassland is designated as a Local Wildlife Site (See Figure 2, Appendix 1). The Nottinghamshire Wildlife Trust know the site to be good for aquatic invertebrates, namely dragonflies and damselflies.

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<sup>1</sup> Nottinghamshire Wildlife Trust 1996 Management Plan for Spa Ponds Nature Reserve, *Clipstone, Mansfield*.

### 3. METHODOLOGY

#### 3.1.1 Ecological Walk-over Survey

An ecological walk-over survey of the site was conducted and notes were made on the Phase-1 habitat types present (JNCC 2010) and their suitability for protected species. Target notes were used to record any habitats or features of particular interest and any sightings, signs or evidence of protected or notable faunal species or any potential habitat for such species, as detailed below:

- The suitability of habitats for badgers (*Meles meles*) was recorded and any evidence of badgers including setts, dung pits, badger paths, hairs, bedding, footprints and scratching trees was noted.
- Trees with features suitable for roosting bats were noted, such as hollows, cracks and cavities within trunks and branches (e.g. old woodpecker holes), crevices behind loose bark and ivy growth.
- The suitability of habitats was assessed for amphibians (including great crested newt *Triturus cristatus*) and reptiles.
- The suitability of habitats was assessed for nesting birds.

EMEC Ecology visited the site to carry out the above walk-over survey on 20<sup>th</sup> February 2015.

#### 3.1.2 Survey Limitations

Surveying in February is not an ideal time to carry out a habitat survey as it is outside of the plant growing season (i.e. April to September inclusive) when plants may not be readily apparent and many faunal species are less active / dormant. However, vegetative growth including seed heads are generally still visible and can be identified by an experienced surveyor and used to make reliable judgements about the quality and composition of habitats.

Only a brief assessment of the site / survey area was made and no systematic surveys to establish the presence / absence of protected species were undertaken. As such, a lack of evidence of a protected species does not necessarily indicate an absence of the species. It should be noted that a single visit at any time of year is likely to miss a proportion of the plant species present.

#### 3.2 Ecological Evaluation Criteria

Ecological evaluation was undertaken using a combination of evaluation criteria for both habitats and species although the general framework follows that provided by the Institute of Ecology and Environmental Management (IEEM 2006). Key categories are as follows:

- International value (internationally designated sites or sites supporting populations of internationally important species);
- National value (nationally designated sites (e.g. SSSI) or sites supporting viable populations of nationally important species);

- Regional value (sites exceeding county-level designations but not meeting SSSI criteria or supporting viable populations of species on the regional Biodiversity Action Plan, BAP);
- County value (county sites (e.g. Local Wildlife Site) and other sites which meet the published ecological selection criteria for county designation, a viable area of habitat identified on the county BAP);
- District value (sites/features that are scarce within the District and appreciably enrich the District's habitat resource);
- Parish value (areas of habitat considered to appreciably enrich the habitat resource within the context of a parish or neighbourhood);
- Sub-parish value (common, low grade habitats).

Additional criteria employed were from the following:

- Schedules and Annexes of UK and European wildlife legislation (e.g. Wildlife and Countryside Act (1981) (as amended) and The Conservation of Habitats and Species Regulations 2010 (as amended);
- International conventions on wildlife (e.g. Bern Convention, Bonn convention);
- Habitats and Species of Principal Biological Importance listed on Section 41 of the Natural Environment and Rural Communities Act (2006);
- UK Biodiversity Action Plan (UK BAP 2007);
- County Biodiversity Action Plan (Nottinghamshire BAG 1998);
- Taxa-specific conservation lists (e.g. RSPB Lists of species of conservation concern, RSPB 2009).

## 4. ECOLOGICAL BASELINE

### 4.1 Extended Phase-1 Habitat Survey

#### 4.1.1 *Habitat Types*

The following habitat types were recorded (on and immediately adjacent to the site):

- ❑ Arable
- ❑ Semi-natural broadleaved woodland
- ❑ Plantation coniferous woodland
- ❑ Scattered scrub
- ❑ Acid grassland
- ❑ Marsh
- ❑ Marginal vegetation
- ❑ Open water
- ❑ Running water
- ❑ Species-poor hedgerows (defunct and intact)
- ❑ Tall ruderal
- ❑ Track

Habitat and target notes descriptions are provided below. Nomenclature follows that of Stace (1997). In the text species are referred to using their English names, Appendix 2 provides a list of species including their scientific names.

#### 4.1.2 *Habitat Descriptions*

##### a) *Arable*

Arable farmland bordered the Nature Reserve along the western edge and the north-eastern corner. No arable farmland exists within the site.



b) *Semi-natural Broadleaved Woodland*

The majority of the Reserve was semi-mature to mature broadleaved woodland. The woodland around the southern half of Packman's Way was dominated by sweet chestnut, other species included hazel, silver birch, sycamore and oak. There was a lack of young growth of tree species, with the exception of area identified by Target Note 5, where coppicing has been undertaken in the past and there was a substantial amount of new growth. The ground flora was dominated by bramble throughout the southern half of the reserve, with occasional cleavers, common nettle, bracken, lesser celandine, wood avens and dandelion species.



The northern half of Packman's Way, west of the ponds had a canopy which was dominated by silver birch with an understorey of hawthorn and the occasional elder along the hedgerow. The ground flora was dominated by bramble with bluebell, red campion, cock's foot, common nettle, white dead-nettle and cow parsley.



The woodland east of the ponds (Target note 6) was dominated by sessile and pendunculate oak and silver birch, occasional alder trees were present on the banks of the ponds as were broom and gorse. Bracken dominated the ground flora immediately adjacent to the ponds, in the rest of the woodland red fescue and bracken were recorded.



c) *Plantation Coniferous Woodland*

The woodland known as the Garibaldi Plantation was dominated by Corsican Pine and neighbours Spa Ponds along most of its eastern boundary. The picture below demonstrates the proximity of Garibaldi Plantation (corsican pine trees on right) to Spa Ponds (silver birch trees on right).



d) *Scattered Scrub*

The ground flora of the woodland south of the ponds was dominated by bramble, with occasional patches of ivy and rhododendron near to the southern entrance of the Reserve. Bramble was also growing around the edges of the ponds and encroaching upon the acid grassland.

e) *Acid Grassland*

The majority of the woodland understorey east of the ponds is acid grassland, at the time of the survey red fescue was recorded in the grassland.





f) *Marsh*

North of the River Maun, on the eastern side of the footpath there was area of marsh. This was immediately adjacent to the River Maun and therefore the water level would be sustained throughout the year. Species recorded include reed sweet-grass, lesser celandine, great willowherb, cuckoo flower, water figwort and ground ivy.

g) *Marginal Vegetation*

Around the southern edge of Pond 3 was an area of marginal vegetation approximately 10 x 5 metres in size and was dominated by reed sweet-grass, when the survey was undertaken the water flowing down from Pond 2 formed a small stream through the marginal vegetation before reaching the main body of Pond 3. Bramble was present around the edge, but the dominant species recorded during the survey was reed sweet-grass.



h) *Open Water**Pond 1 (Target note 1)*

The southernmost pond (approximately 450m<sup>2</sup>) contains the spring that feeds the four ponds. At the time of survey the water level within the pond was quite low, approximately 15cm. The margins of the pond were dominated by bramble with a stand of soft rush on the eastern bank. Within the pond there were a small number of saplings growing and at the northern end of the pond there was algal growth alongside dead wood within the pond. There was an outflow pipe in the north-east corner of the pond that runs underneath the footpath into Pond 2.

*Pond 2 (Target note 2)*

Pond 2 measured approximately 1900m<sup>2</sup> in size. The water was quite murky and there was a lot of leaf litter within the pond around the banks. The water flowing out from Pond 1 runs down a small stream for approximately 10m before entering Pond 2. On the bank around the pond there were semi-mature to mature birch and alder trees with the ground flora dominated by bramble and red fescue. There was little evidence of aquatic plants growth within the pond except for small areas of yellow flag, soft-rush and bulrush in the north-east corner. The outflow pipe into Pond 3 was located under the footpath in the north-west corner of the pond.





*Pond 3 (Target note 3)*

Pond 3 measured approximately 2700m<sup>2</sup> in size with a small island in the middle approximately 9m<sup>2</sup>. Silver birch and alder trees were on the banks around the whole pond with ground flora composed predominantly of bramble and red fescue. Very little vegetation was seen growing within the pond apart from a few small patches of yellow flag. The outflow pipe runs underneath the footpath in the north-west corner of the pond.

*Pond 4 (Target note 4)*

Pond 4 measured approximately 1500m<sup>2</sup> in size within two small islands approximately 70m<sup>2</sup> and 35m<sup>2</sup>. The trees surrounding the pond were predominantly silver birch with bramble and red fescue for ground flora, no aquatic vegetation was recorded growing during the survey. Moorhen (*Gallinula chloropus*) and mallard (*Anas platyrhynchos*) were both present on the pond.

i) *Running Water*

The River Maun runs immediately adjacent to the Nature Reserve from west to east. The bridge over the river is owned by the FTNCG and is therefore part of the Reserve, however the rest of the river occurs outside the reserve.

j) *Species-poor Hedgerows (defunct and intact)*

There was a hedgerow that runs along the western boundary of the Reserve. The northern half of Packmans Way adjacent to the ponds had a hawthorn hedgerow with many standards along its length.

The southern half of Packman's Way (before the ponds) had a defunct hedgerow along the woodland edge, although it more closely resembles a line of trees, with large gaps along much of its length. In places the gaps have been filled with brash or dead wood (see photos below).

Ground flora of the hedgerows comprised of grasses and tall ruderal species such as bramble, ivy, great willowherb, common nettle and cleavers.



k) *Tall Ruderal*

Tall ruderal vegetation occurred infrequently throughout the site along the bridleway and hedgerows. Species included common nettle, great willowherb, hogweed and cow parsley.

l) *Track*

A bare earth and gravel bridleway occurred through the length of the site, looping around the ponds and rejoining just before the bridge over the River Maun. Additional tracks were present leading off into Garibaldi Plantation to the east.

4.1.3 *Target Notes*

The location of the target notes are shown on Figure 2 Appendix 1.

- 1) Pond 1.
- 2) Pond 2.
- 3) Pond 3.
- 4) Pond 4.
- 5) Stand of young growth, previously coppiced.
- 6) Oak and birch woodland with acid grassland understorey.

4.1.4 *Faunal Species*

a) *Amphibians*

There were four ponds located within the survey area that may provide breeding habitat for common amphibians. The ponds are known to have been restocked by fisherman with perch and waterfowl were recorded on Pond 4. The hedgerows along the western boundary of the site and the tussocky grassland provided suitable overwintering and foraging habitats for amphibians.

b) *Badger*

No signs of badger were noted on site during the survey. The woodlands provided potential sett building habitat and the grassland and adjacent farmland provided potential foraging opportunities. Mammal tracks were recorded within the woodland during the survey.

c) *Bats*

The majority of trees on site did not provide any obvious bat roosting potential, however, a small number of trees did have the potential for supporting roosting bats. It is likely however, that adjoining residential properties may support bat roosts and the site provides good potential foraging for bats. The linear features such as hedgerows and woodland edges may provide commuting routes.

d) *Nesting Birds*

The woodlands and hedgerows provided good potential nesting habitat for a variety of birds. The berry-producing scrub species, such as hawthorn and the ruderal vegetation, provide foraging opportunities for birds. Species seen during the survey include robin (*Erithacus rubecula*), great tit (*Parus major*), blackbird (*Turdus merula*), mallard and moorhen. Additionally, a lesser-spotted woodpecker (*Dendrocopos minor*) was heard drumming during the survey.

e) *Reptiles*

The habitats on site provided only very limited opportunities for reptiles. No open basking areas or good commuting routes such as dry ditches were noted on the site. The ponds were considered to provide good foraging potential for grass snakes (*Natrix natrix*), however as they are quite shaded it is considered unlikely that they will be present on site.

## 5. EVALUATION

### 5.1 Habitats

The evaluation of the habitats within the site is based on the guidelines from CIEEM (IEEM 2006). As indicated the individual habitats within the site are considered to be of moderately low 'Parish' value to low 'Sub-Parish' value.

Table 5.1: Summary of Ecological Evaluation of the Habitats on the Site

Habitat	Reason for Valuation
<b>County Value</b>	
Open Water	The underlying geology of the ponds is Sherwood Sandstone, therefore ponds and springs are a rarity on this kind of substrate. Historically the ponds have been known to support good populations of common amphibians and a good diversity of aquatic invertebrate species.
<b>District Value</b>	
Semi- broadleaved woodland	The woodland supported a number of tree species and provided good nesting and foraging habitat for birds. The woodland also provided potential sett-building habitat for badger and shelter for common amphibians. There was no notable ground flora recorded in the woodland at the time of the survey.
Running water (River Maun)	A small section of the River Maun is located within the reserve, but the river does border the northern edge of the reserve. The river and associated bankside habitats act as a wildlife corridor along which animals and plants can disperse.
<b>Parish Value</b>	
Acid grassland	The grassland provided potential foraging and sheltering opportunities for common amphibians and invertebrate species.
Marginal vegetation	There was a limited amount of marginal vegetation available and limited diversity of the species present. It is likely to provide limited potential for nesting waterfowl, as well as feeding and breeding potential for invertebrate species including dragonflies and damselflies.
Species-poor hedgerows (intact & defunct)	The hedgerows contain a limited number of woody species and no characteristic ground flora. They would not qualify as 'important' (using ecological criteria) under the Hedgerow Regulations (1997). However, all hedgerows are of ecological value and provide 'ecological corridors' along which plants and animals can disperse. They provide potential bird nesting habitat, bat foraging and commuting routes and amphibian cover and sheltering opportunities.
Marsh	Contains a variety of common species. Provides potential foraging habitat for bats, amphibians and nesting birds.
<b>Sub-Parish Value</b>	
Scattered scrub	The scattered scrub in the south of the site is botanically species-poor and limited in extent. It is likely to provide bird nesting and foraging habitat.
Tall ruderal	Comprises a number of common floral species and is likely to provide shelter for faunal species and foraging for birds and invertebrates.



## 5.2 Protected/notable Species<sup>2</sup>

### 5.2.1 *Floral Species*

None of the species recorded during the survey are specifically protected by the Wildlife and Countryside Act (WCA) 1981 (as amended) or considered rare nationally or locally (e.g. Preston *et al.* 2002). Also, none are listed as Priority Species on the national BAP (UK BAP 2007) or County BAP (Nottinghamshire BAG 1998).

Although not seen during the survey (due to the time of year the survey was undertaken), it is understood that Himalayan balsam is present on site and a program of pulling has been undertaken to try and remove it.

### 5.2.2 *Faunal Species*

#### a) *Amphibians*

The ponds located within the Reserve are known to contain fish, having been restocked in the past by local fishermen. Common amphibians can co-exist with fish, although their ability to do this differs between species. Common toad tadpoles for example are distasteful to fish and smooth newt larvae and common frog tadpoles, although vulnerable to predation by fish do often breed successfully in stocked ponds. This is likely to depend on the availability of refuges and shallow areas for the larvae. It is considered unlikely that great crested newts would use the ponds for breeding due to the presence of fish. Fish are a major negative factor for great crested newt survival. Since great crested newt larvae, unlike smaller newt species, swim and drift within the water column, they are extremely vulnerable to predation by fish (Beebee and Griffiths 2000).

The hedgerows, woodlands and tall ruderal vegetation offer potential sheltering opportunity for common amphibians.

#### b) *Badger*

Although no evidence of badger was recorded during the survey, the woodlands and to a lesser extent the hedgerows, provide potential sett-building and foraging habitat. The adjacent arable fields provide potential foraging opportunities.

#### c) *Bats*

There were a small number of features within some of the trees on site that provide potential roosting potential for bats. Additionally the site provides good foraging and commuting opportunities for bats.

#### d) *Nesting Birds*

The site provides resource for a variety of species recorded by FTNCG, including some notable species. A kingfisher (*Alcedo atthis*) has been spotted on multiple occasions within the reserve in 2015 by the FTNCG and during our survey a lesser-spotted woodpecker was heard drumming.

#### e) *Reptiles*

The site is considered to represent sub-optimal habitat for reptiles as basking and foraging potential for these species is considered to be limited.

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<sup>2</sup> Protected species legislation is provided in Appendix 2.

## 6. MANAGEMENT OPERATIONS

### 6.1 Management Objectives

Management objectives are listed below. The aim is to maintain and where possible enhance the existing habitats on site with particular consideration towards aquatic invertebrates and birds. The rationale for the objectives and management operations is given in Section 6.2 and a Plan of Works is given in Section 6.3.

The management objectives are:

1. **Woodlands:** Maintain and enhance the woodland areas to encourage the healthy growth of trees and maintain a mosaic of woodland habitats. Increase the diversity within the woodlands by improving the ground flora.
2. **Hedgerows:** Maintenance and enhancement of the existing hedgerows.
3. **Supplementary Habitat for Faunal Species:** Install bird nest boxes, bat roost boxes and invertebrate habitat boxes to increase the value of the site for faunal species.
4. **Ponds:** Maintenance and enhancement of pond edges, water flow between the ponds and the vegetation structure within the ponds.
5. **Access, Litter and Vandalism:** Ensure woodland paths are maintained; the woodlands are secure from off-road vehicles and the site free of litter and vandalism.
6. **Invasive Species Control:** Removal of Himalayan balsam and rhododendron.
7. **Monitoring & Further Survey Work:** Monitor the effects of management on flora and fauna.

## 6.2 Management Rationale

The management rationale for each objective shall be separated (where appropriate) into practices that should be undertaken regularly (annual), semi-regularly (every few years) and some practices that are aspirational and may be dependent on acquiring funding to undertake.

### 6.2.1 Objective 1: Woodlands

#### □ Rationale

*Maintain and enhance the woodland areas to encourage the healthy growth of trees and maintain a mosaic of woodland habitats.*

*Increase the diversity within the woodlands by improving the ground flora.*

#### Semi-natural Broadleaved Woodland

The woodlands are currently, generally semi-mature to mature. Some areas of relatively dense young growth occur, and these may require thinning in the future in order to encourage the broadening spread of tree crowns and prevent 'leggy' or spindly growth form. Recommendations for thinning are given below.

The aim of woodland management should be to create a diversity of structures and different ages of trees. Generally, woodlands which are structurally diverse and support a wide range of micro-habitats tend to sustain more biodiversity. The woodlands, should support a variety of tree species of different ages, along with damp, closed canopy areas, sunny, sheltered glades, and a well-developed understorey of shrubs and saplings. Standing deadwood and deadwood habitat piles are also important components of a healthy woodland.

#### *Thinning*

Although the semi-natural woodland appears to be in a healthy condition there are some areas where the young growth is rather dense (Target note 5), which may prevent light from reaching the floor and therefore supporting abundant shade tolerant plants such as bramble and nettle. These areas of the woodland should be monitored and, if considered necessary in future years, selective thinning should be carried out. This process should be aimed at increasing habitat diversity, removing less healthy or less desirable trees (such as sycamore and non-native cherry). Thinning should be carried out following the basic principle of removing approximately 25% of the trees (i.e. removal of one tree in four to encourage the growth of the remaining trees) or to allow space for mature trees to continue to thrive. If too many trees are removed this could let in too much wind which may cause damage. Woodland edges should always remain intact.

Internal rides, glades and other open spaces are important structural elements within woodland, providing valuable habitat for a wide range of wildlife, much of which differs from the internal woodland areas. A diverse range of sun-loving plants and insects benefit from these sunny open areas and, in contrast, other insects, plants, birds and mammals benefit from the woodland edge, which is essentially the interface between the woodland and open ground. Due to the shape of the woodland it isn't wide enough to

create any glades, however Packman's Way could be managed as an internal ride within the woodland.

Habitat piles of logs and/or brash should be created through the thinning process. Sometimes in management of woodlands there is the over emphasis to 'tidy' the woodland; however deadwood scattered through the wood would create further habitat for invertebrates and refuge for common amphibians. These should be located close to the edge of the woodland.

**Any works which involve tree or shrub removal should be timed to avoid the bird breeding season (March to September inclusive).**

### Woodland Ground Flora

The survey of Spa Ponds was not undertaken at the optimal time of year and therefore the recommendations for enhancement of the woodland ground flora are given without full understanding of the floral community that is present.

Most of the ground flora within the woodland at Spa Ponds was dominated by bramble. It provides important cover and source of food for ground dwelling mammals and birds, as well as being the food plant for more than sixty moth species native to the UK. However, the presence of dense bramble can out compete many other woodland floral species including slower growing tree species such as oak and beech (*Fagus sylvaticus*).

It is recommended that bramble be removed from the woodland floor from Packman's Way up to five metres into the woodland, this will hopefully increase the diversity of the woodland by allowing other woodland floral species the chance to grow.

The preferred method of plant removal would be mechanical removal using a hoe (ensuring the entire rootstocks of 'weed' species are removed). Unfortunately it is very difficult to remove bramble entirely from an area and this would therefore be an annual task.

If once cleared there is only limited woodland floral growth it is recommended that a seed mix is used or plugs are planted to increase the diversity of plants present.

### *Seed Mix Application & Plug Planting*

A suitable woodland seed mix is provided below.

<i>Agrimonia eupatoria</i>	- Common Agrimony 5%
<i>Alliaria petiolata</i>	- Garlic Mustard 8%
<i>Allium ursinum</i>	- Ransoms/ Wild Garlic 3%
<i>Angelica sylvestris</i>	- Wild Angelica 5%
<i>Campanula trachelium</i>	- Nettle Leaved Bellflower 3%
<i>Digitalis purpurea</i>	- Wild Foxglove 5%
<i>Filipendula ulmaria</i>	- Meadowsweet 5%
<i>Galium mollugo</i>	- Hedge Bedstraw 5%
<i>Geranium robertianum</i>	- Herb Robert 0.5%
<i>Geum urbanum</i>	- Wood Avens 7%
<i>Hyacinthoides non-scripta</i>	- English Bluebell 12%
<i>Hypericum hirsutum</i>	- Hairy St. John's Wort 3%
<i>Primula vulgaris</i>	- Wild Primrose 1%

<i>Prunella vulgaris</i>	- Self Heal 8%
<i>Silene dioica</i>	- Red Campion 7.5%
<i>Stachys officinalis</i>	- Betony 5%
<i>Stachys sylvatica</i>	- Hedge Woundwort 8%
<i>Teucrium scorodonia</i>	- Wood Sage 5%
<i>Torilis japonica</i>	- Upright Hedge Parsley 4%

Seed mix available from Naturescape ([www.naturescape.co.uk](http://www.naturescape.co.uk)): N10 Woodland Mixture.

Although seed is effective in establishing woodland flora, plug plants are particularly useful for species that primarily propagate vegetatively such as those listed below, or where rapid results are required (bluebell can take up to five years to reach the flowering stage from seed).

Recommended species for plug planting include:

<i>Anemone nemorosa</i>	-Wood anemone
<i>Oxalis acetosella</i>	-Wood sorrel
<i>Ajuga reptans</i>	-Bugle
<i>Lamium galeobdolon</i>	-Yellow archangel
<i>Hyacinthoides non-scripta</i>	-Bluebell ( <i>can also be planted as bulbs in autumn</i> ).

The planting/sowing of woodland ground flora could be trialled in small plots. Woodland wildflower seed/plants will thrive under medium to high shade, where there is sparse or no existing vegetation, hence the introductions should be targeted for the shadier, weed-free areas of the woodland. If the plots establish successfully, they could provide a viable seed source for the remaining woodland.

Little ground preparation is required, other than raking, and seed should be distributed by hand between October and March, ideally in late autumn (October/November). Most species should germinate in the first season. In order to mimic the mosaics of species that occur naturally in woodlands, plug plants should be clustered in discrete patches which should both enhance the diversity of the woodland field layer, and allows for plants to colonise other parts of the wood.

If the ground flora seed/plants have been selected carefully to suit site conditions and have been introduced at appropriate planting times and at appropriate densities, then no direct aftercare should be necessary providing the management prescriptions for weeding and thinning are followed. Following introductions, it is not uncommon to see a decline in plants in the first season. Subsequently, the number of plants should increase rapidly, particularly when individual species are clustered in high densities (Dixie 1996).

### 6.2.2 Objective 2: Hedgerows

*Enhance the existing hedgerows bordering the edge of the site.*

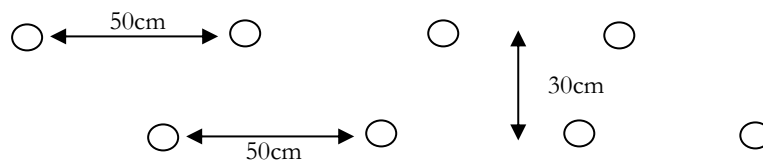
#### □ Rationale

There is a defunct hedgerow on the woodland edge along the western border of the reserve. It is recommended that this hedgerow is restored, increasing the potential habitat for nesting birds on the site. Two options are proposed for the restoration; either to create a dead hedge to fill the gaps or to plant whips in the gaps along the hedgerow.

A dead hedge is an immediate solution to the defunct hedgerow. It immediately makes the site more secure against the use of motorbikes and providing habitats for nesting birds, mammals and invertebrates. Planting up the gaps within the hedgerows costs money to buy the whips and they take time to become established, with the problems the site has had with vandalism any whips that are planted may be uprooted. It is therefore recommended that if the hedgerow is to be planted, a trial area should be used and if uprooting does occur then dead hedges should be used instead.

#### *Hedgerow planting*

Whips should be planted in two rows. These rows should be spaced 30cm apart with planting staggered at 50cm (as shown below). This equates to four plants per metre.



Monitoring of hedgerows should occur annually for the first five years and any shrubs which die or become damaged or diseased should be replaced like for like (this is likely to require the addition of compost or manure). After-planting maintenance (weeding, beating up and pruning/trimming) should be undertaken as required.

As the hedgerows mature, trimming should be carried out as necessary, to help develop and maintain a thick, bushy structure. Hedgerows should be trimmed in January or February (to avoid the bird breeding season and to allow the berry crop to be utilised by wintering birds).

Trimming is likely to keep hedgerows in good condition for many years. However, occasional restoration work will be necessary to prevent hedgerows becoming 'gappy' (as branches low down on the main stems gradually die off) or developing into a line of trees. At this time laying the hedge may be recommended.

#### *Maintenance of intact hedgerows*

Intact hedgerows should be trimmed in January or February (to avoid the bird breeding season and to allow the berry crop to be utilised by wintering birds (September-December). Trimming should be carried out on a 2 – 3 year rotation and trimming of all hedgerows in the same year should be avoided. Some invertebrate species will overwinter as pupa on hedgerows and wholesale trimming of the hedgerows reduce the population



of these species dramatically. Rotational trimming will ensure a variety of hedgerow structures across the reserve and allow over wintering species to recolonise the trimmed hedgerow sections.

### 6.2.3 Objective 3: Supplementary habitat for faunal species

*Install bird, bat and invertebrate boxes to increase the value of the site for faunal species.*

#### Rationale

The installation of bird, bat and invertebrate boxes would enhance the woodland for faunal species. However, where funding is limited these are probably of a lower priority. Additionally, as Spa Ponds has problems with vandalism the FTNCG should consider whether the installation of these boxes on site would be suitable. It is recommended that a trial of a small number of boxes be carried out to see if any vandalism does occur, and the boxes should be installed at a sufficient height to deter vandalism.

If they end up being vandalised this will have a negative impact upon any species that are occupying. Additionally, it would essentially be a loss of money having installed them, if they are broken/removed. General recommendations for suitable locations to install bat, bird and invertebrate boxes follow below and examples of boxes are given overleaf.

#### *Bats*

The boxes should be sited within woodland edges or clearings, ideally over 3m high, with **three boxes per tree**, in order to ensure that the boxes have different aspects, and with a clear flight path to the box. Bat boxes suitable for a number of species can be bought online or hand-made. Hand-made boxes should be constructed from untreated, rough-cut hard wood. Advice on building bat boxes can be given by EMEC Ecology or the Nottinghamshire Bat Group.

#### *Birds*

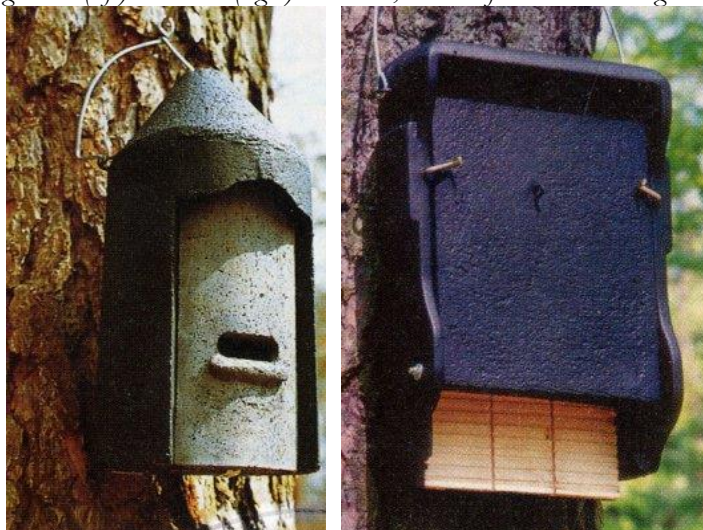
The type of boxes that are installed and their location can vary greatly depending on the species that they are designed for. Ideally, the entrance holes into timber bird nest boxes should be reinforced with steel plating to prevent gnawing by squirrels (see image below).



#### *Invertebrates*

Invertebrate boxes should ideally be situated within warm, sheltered habitats. Those shown overleaf are suitable for range of invertebrates including butterflies, ladybirds, lacewings and solitary bees.

*Schwegler 2F (left) and 1FF (right) bat boxes, suitable for crevice-dwelling bat species*



*Variety of bird nest boxes: Schwegler 1B (left), large bird nest box (centre), woodpecker/starling nest box (right)*



*Variety of insect boxes to support butterflies, bees and other insects*



#### 6.2.4 Objective 4: Ponds

*De-silting of the ponds to maintain and enhance the diversity of habitats.*

*Thinning of canopy around the ponds*

*Maintenance of pond outflow pipes*

##### Rationale

Spa Ponds Nature Reserve has historically been known by the Nottinghamshire Wildlife Trust to support good populations of a variety of aquatic invertebrates. The ponds should therefore be managed in a way that is favourable towards these species. In the absence of an aquatic invertebrate survey at Spa Ponds it is recommended that any management of the ponds should not drastically alter the ponds as this may have adverse impacts on the present aquatic community.

##### *De-silting*

During the survey of Spa Ponds it was noted that leaf litter was present around the margins of the ponds. The ponds are of ecological and historical importance and the successional progression of the ponds should therefore be countered.

Prior to de-silting being undertaken it is important to consider that the leaf litter present in the ponds, including the dead wood found within some of the ponds, is itself an important habitat for many aquatic species. Tree trunks and branches within the water provide habitat structure and can be colonised by algae, whilst fungi provide food for invertebrates. As the wood rots, invertebrates such as the southern hawker (*Aeshna cyanea*) and brown hawker (*Aeshna grandis*) dragonflies often use it to lay eggs on or within. Rotting leaves themselves provide a food source for species of freshwater shrimp and caddis fly larvae and any of this detritus may be used by caddisfly larvae to build their cases. Dead wood within a pond may not be aesthetically pleasing, but it is recommended that some be retained. The wood could be tidied into a number of log piles within the water rather than being strewn across the ponds if the aesthetics were an issue.

As the composition of the aquatic invertebrate community is unknown at this time the de-silting should be undertaken on a rotational basis. How much de-silting is undertaken will also be influenced by resources and man-power. A general rationale shall be provided as it is difficult to provide an accurate rationale when the influencing factors may vary.

For example, if ten metres of the pond are to be de-silted along the bank of a pond, this should not be undertaken on one continuous 10m stretch. To preserve the habitats and communities already present in the ponds, it is recommended that de-silting be undertaken in five metre sections, with at least five metres gap between each section. De-silting in this way will, to a certain extent maintain the habitat already present whilst also diversifying the depth and structure of the habitats within the pond, presenting niches for aquatic invertebrate species and allowing any aquatic vegetation that has been removed to recolonise. During the survey there was only a small amount of aquatic vegetation within the ponds, it is therefore recommended that the locations of any vegetation within the ponds are avoided to preserve them.

Until an aquatic invertebrate survey of the ponds has been undertaken it is recommended that a partial de-silting of the ponds should be undertaken and a maximum of 30% of the banks of each pond should be de-silted in any one year. Information provided by FTNCG and NWT has shown that the ponds are used by a good population of common amphibians, any de-silting should therefore be undertaken outside of the breeding season for amphibians when the adults will not be in the ponds. It is not considered that the specially protected great crested newt will be present in the ponds. The summer is a suitable time to de-silt and is also the easiest time for de-silting as the water is at its lowest level.

Ponds 1, 2 and 3 are all shallower at the “southern end”. Ponds 2 and 3 both have a small stream with marginal vegetation that feeds into them from the outflow of the previous pond. If de-silting is undertaken these areas should be preserved as shallow areas and should not be dug out as they provide a habitat for many aquatic and terrestrial species, some using it in its wet phase and others when it is a dry. Some aquatic invertebrates such as the southern hawker dragonfly and the brilliant emerald damselfly (*Somatoclora metallica*) will lay their eggs in these areas as they are safe from predation by fish.

#### *Thinning of trees surrounding the pond*

The ponds are immediately surrounded by the woodland with many immature to semi-mature trees growing on the banks of the ponds. As a consequence, the margins of the ponds are greatly shaded which may be reducing the amount of aquatic vegetation growing within the ponds. Additionally, the large number of trees around the ponds significantly contributes to the amount of leaf litter within the ponds.

The roots of the trees around the ponds will be giving stability to the banks, therefore it is not recommended that any of the trees are totally removed, instead it is recommended that a coppicing regime be implemented. Coppicing allows light in to the woodland floor, promoting growth of desirable woodland plant species. It also produces structural diversity within the woodland; many bird species also have an association with coppice of different ages. The trees surrounding each pond should be divided into eight compartments and rotationally coppiced in an eight year cycle. Coppicing should be carried out over the winter months to avoid the bird nesting season, ideally from November to February.

#### *Maintain pond outflow pipes*

The outflow pipes should be checked on a regular basis to ensure that they are not blocked with any litter or vegetation. Any blockages should be removed to avoid water building up in the ponds and flowing over the footpaths.

### 6.2.5 Objective 5: Access, Litter and vandalism

*Ensure woodland paths are maintained; the woodlands are secure from off-road vehicles and the site free of litter and vandalism.*

#### Rationale

##### *Access*

The footpaths on site, in particular the bridleway (Packman's Way) should be maintained to encourage users to keep to the footpaths, additionally any risks to anybody using the footpaths should be dealt with appropriately.

Ideally the bridleway should be maintained to a width of three metres without any ruts. When substantial ruts do develop in any of the footpaths the earth/gravel should be redistributed to level them out. Some areas of the footpath are prone to puddles forming or the earth remaining soft and damp.

The woodland is higher on either side of the footpath where puddling is an issue, therefore any surface runoff, runs down onto the footpath. To avoid water pooling on the footpath the height of the footpath should be raised, so that it is not the lowest point in the woodland. Three recommendations are given to try and reduce the puddling on the paths, namely, the application of wood chips to wet areas, the burying of logs underneath the footpath and the installation of stone/gravel footpaths.

These three recommendations have varying costs and potential longevities. Applying wood chips would be the cheapest, easiest solution but is likely to be a short-term solution, needing reapplication in the future. Burying logs underneath the path should be considered as a mid-term solution that is a more substantial task to undertake. The logs should be buried sufficiently deep so that they are unlikely to become uncovered in the future by displacement of soil as they could become slippery creating a hazard. The installation of stone/gravel footpaths is the solution with the longest lifespan but is also considerably more expensive than the other two options and therefore may not be feasible with limited funding.

Any trees that are dead, dying or diseased that may fall onto the footpaths should be cut down so that they are not a hazard to visitors. It is recommended that dead or dying trees that do not present a danger to anybody walking along the footpath should be left in place to provide a habitat for a variety of species including bats, birds, invertebrates and fungi.

There is a lack of dead wood habitat and ideally any trees that are felled should be retained on site. When log piles are left in woodlands, particularly in more urban areas, there is a tendency for people to take the wood for log burners. Inconspicuous locations for log piles may be difficult to come by in the Spa Ponds Nature Reserve as it is quite narrow, therefore it is recommended that logs retained are dispersed within the woodland across the site. Logs found individually across the site will be less obvious and less attractive to people as it requires more effort to obtain them.

##### *Litter & Vandalism*



Vandalism, littering and the use of vehicles, namely motorbikes, has long been a problem at Spa Ponds due to its proximity to housing estates. When the survey of Spa Ponds was carried out, the site was very clean with regards to litter. Signs are present on site to deter people from littering and the use of motor vehicles, however, it is assumed that the cleanliness of the site is due to the work of FTNCG, wardens and volunteers tidying the site, rather than litter no longer being an issue.

The efforts of litter collecting should be maintained as much as possible. Further community engagement and awareness of the litter issue and the value of the site may help to reduce the amount of littering/flytipping.

### 6.2.6 Objective 6: Invasive Species Control

#### *Removal of Himalayan balsam (Impatiens glandulifera)*

##### Rationale

Although Himalayan balsam was not recorded during the survey of Spa Ponds, the NWT and FTNCG have recorded its presence on site. It can be controlled by hand pulling during the growing season, April to May before the seed pods are present (usually after May). If hand pulling is to be used when seed pods are present, the plant tops should be bagged to prevent seed spread. When pulled, it is possible for the plants to re-root if left on the ground. Therefore the pulled plants should be left to dry out where they are not in contact with the ground.

During the growing season it would be beneficial to investigate whether the species is present on land adjacent to Spa Ponds, as recolonisation would be possible. If Himalayan Balsam is present on adjacent land, it would be beneficial to try and work with the other land owners to remove it from the wider environment.

The seeds of Himalayan balsam are able to survive for up to eighteen months, therefore a two year control programme should be successful in eradicating the species as long as there are not further infestation incidents.

Himalayan balsam is an invasive species which is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), which makes it offence to plant or cause it to grow in the wild.

### 6.2.7 Objective 7: Monitoring

*Monitor the effects of management on flora and fauna.*

#### Rationale

##### *Improved species records for Spa Ponds*

Further survey work at the appropriate time of year would serve to improve the knowledge of the species that occur within the Spa Ponds Nature Reserve. Any further survey work would better inform the management plan and allow the assessment of the effects that the current management is having on the Reserve, which could inform future changes to the management. Details of further recommended surveys can be seen below.

It is understandable that the funds for further survey work may not be available to the FTNCG and where funds are available they may need to be prioritised for the management of the Reserve.

Therefore, it is recommended that members of the FTNCG and the general public that frequent the site should be encouraged where possible, to record any species that they have observed on site. It is unlikely that records obtained in this way will be of a comparable level to survey work carried out by a suitably knowledgeable ecologist/naturalist, but it is a good substitute with the advantage of records being provided throughout the year rather than from a single site visit.

Further ecological survey work to be considered if funds are available include:

##### *Aquatic invertebrate survey*

The site has in the past been known for its aquatic invertebrate communities, in particular dragonflies and damselflies. Although it has had this reputation in the past there are few species records for aquatic invertebrates and the current status of the aquatic community is not known, this survey work would therefore be beneficial in establishing a baseline knowledge of the species present, whilst better informing the management of the site.

##### *Botanical survey*

The Spa Ponds site was surveyed during February 2015, therefore the majority of ground flora that would be expected within the woodland and aquatic vegetation expected to be within the ponds was not yet apparent. Botanical surveys during the spring and summer would allow more accurate recommendations to be made towards the enhancement of the floral diversity within the woodland and ponds.

##### *Bats*

Bat transect surveys would be beneficial to determine which species are making use of the site, and in order to monitor the effect of management on bat use of the site. Additionally, if any bat boxes are installed on site, it is recommended that they are checked once a year by a licenced ecologist or by the local (Nottinghamshire) Bat Group.

##### *Birds*

Surveys during the bird breeding season could further assess the use of the woodland by birds, so that the management could be tailored towards the species recorded or to try and attract species that are not currently present on site.

### 6.3 Management Operations: Plan of Work

The following is an ideal plan of work. Although every effort should be made to implement the actions listed, this will be governed by certain constraining factors including resource availability.

#### 6.3.1 Objective 1: Woodlands

*Maintain and enhance the woodland areas to encourage the healthy growth of trees and maintain a mosaic of woodland habitats.*

*Increase the diversity within the woodlands by improving the ground flora.*

Obj.	Action	Timing
1/1	Selective thinning should be carried out in areas where the tree growth is particularly dense. This should be aimed at removing 10-15% of trees (focusing on less desirable species such as sycamore) or sufficient to allow more mature specimens to thrive. Woodland edges should be maintained more or less intact.	October to February (inclusive)
1/2	All works to the woodland should be carried out outside the breeding bird season.	October to February (inclusive)
1/3	Deadwood felled during any work operations should be scattered within the woodland to enhance invertebrate interest and provide shelter for other faunal species.	n/a
1/4	Weeding of bramble in woodland areas adjacent to Packman's Way. This should ideally be carried out through mechanical means, i.e. hoeing.	October to February
1/5	Application of woodland ground flora seed mix and plug plants in woodlands.	Late autumn
1/6	Monitor all woodlands for continued healthy growth of trees and development of woodland ground flora. Species such as nettle and bramble should not be permitted to take over large areas of the woodlands.	Year round

### 6.3.2 Objective 2: Hedgerows

*Enhance the existing hedgerows bordering the track through the centre of the development.*

Obj.	Action	Timing
2/1	Creation of dead hedges to fill in the gaps in the defunct hedgerow.	January to February
2/2	Planting of whips to fill the gaps in the defunct hedgerow. Use a variety of native species to increase diversity.	October to February (inclusive)
2/3	Maintenance of intact/mature hedgerows	January to February
2/4	Monitoring and after planting maintenance, i.e weeding, beating up, pruning/trimming, and replacement of any dead or dying shrubs.	October to February (inclusive)

### 6.3.3 Objective 3: Supplementary habitat for faunal species

*Install bird nest boxes, bat roost boxes and invertebrate habitat boxes to increase the value of the site for faunal species.*

Obj.	Action	Timing
3/1	Install bat, bird and insect boxes if deemed appropriate for Spa Ponds.	Year round
3/2	Monitoring of bat boxes by an appropriately experienced and licenced individual.	October or February to avoid the disturbing bats during hibernation

### 6.3.4 Objective 4: Ponds

*De-silting of the ponds to maintain and enhance the diversity of habitats present.*

Obj.	Action	Timing
4/1	De-silting of ponds when/where necessary.	July to August
4/2	Preservation of the shallow marginal vegetation and bare earth on the south bank of ponds 1, 2 and 3.	n/a
4/3	Thinning trees around pond	October to February
4/4	Maintain pond outflow pipes	Year round

### 6.3.5 Objective 5: Access, Litter and Vandalism

*Ensure woodland paths are maintained; the woodlands are secure from off-road vehicles and the site free of litter and vandalism.*

Obj.	Action	Timing
5/1	Footpaths should be monitored each year and maintenance works carried out as necessary to keep them in good condition.	Year round
5/2	Monitoring of the health of trees adjacent to the footpaths on site. Any trees considered to pose a risk to anybody using the footpaths should be felled and the wood scattered throughout the woodland to provide additional habitat for invertebrates.	October to February (inclusive)
5/3	Litter picking to be carried out when possible/necessary. Litter to be removed from the site and disposed of appropriately. Any vandalism / fly tipping should be appropriately dealt with / removed.	Year round

### 6.3.6 Objective 6: Invasive Species Control

*Removal of Himalayan Balsam*

Obj.	Action	Timing
6/1	Hand pulling of any Himalayan balsam and ensuring that it does not re-root once pulled.	April to May (or until seed pods are present)
6/2	Investigation of the land surrounding Spa Ponds to determine whether Himalayan balsam is present in the wider landscape.	April to July



### 6.3.7 Objective 7: Monitoring

*Monitor the effects of management on flora and fauna.*

Obj.	Action	Timing
7/1	Incidental recordings by FTNCG or general public	Year round
7/2	Aquatic invertebrate survey	May to June (inclusive)
7/3	Botanical survey	April to September (inclusive)
7/4	Bat surveys	Mid-May to September (inclusive)
7/5	Breeding bird surveys	Mid-March to July

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**UK BAP 2007** Available: <http://jncc.defra.gov.uk/default.aspx?page=5705>

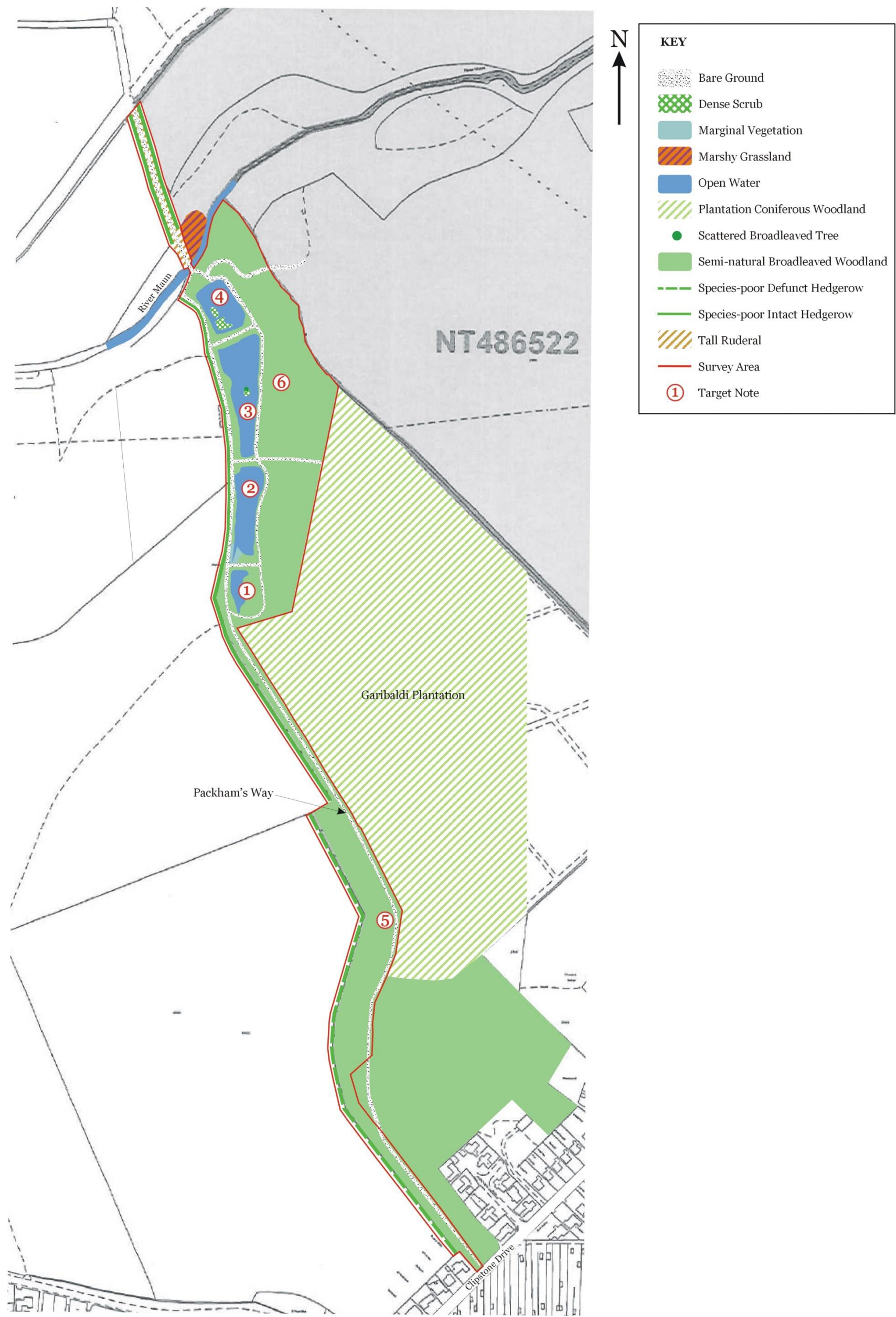
## APPENDIX 1: FIGURES

Figure 1: Site Location Plan (approximate site boundary in red)



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Figure 2: Survey Area, Survey Features and Target Notes



## APPENDIX 2: BOTANICAL SPECIES LIST

English Name	Scientific Name
Alder	<i>Alnus glutinosa</i>
Beech	<i>Fagus sylvatica</i>
Bluebell	<i>Hyacinthoides non-scripta</i>
Bracken	<i>Pteridium aquilinum</i>
Bramble	<i>Rubus fruticosus</i> agg.
Broom	<i>Cytisus scoparius</i>
Bulrush	<i>Typha latifolia</i>
Butterfly-bush	<i>Buddleja davidii</i>
Cleavers	<i>Galium aparine</i>
Common Ivy	<i>Hedera helix</i> ssp. <i>helix</i>
Common Nettle	<i>Urtica dioica</i>
Cock's Foot	<i>Dactylis glomerata</i>
Corsican Pine	<i>Pinus nigra</i> ssp. <i>laricio</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
a crocus	<i>Crocus</i> sp.
Cuckoo-flower	<i>Cardamine pratensis</i>
Dandelion	<i>Taraxacum officinale</i> agg.
Elder	<i>Sambucus nigra</i>
Goat Willow	<i>Salix caprea</i>
Gorse	<i>Ulex europaeus</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Greater Stitchwort	<i>Stellaria holostea</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Hogweed	<i>Heracleum sphondylium</i>
Holly	<i>Ilex aquifolium</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Ivy	<i>Hedera helix</i>
Lesser Celandine	<i>Ranunculus ficaria</i>
Pedunculate Oak	<i>Quercus robur</i>
Red Campion	<i>Silene dioica</i>
Red Fescue	<i>Festuca rubra</i> agg.
Reed Sweet-grass	<i>Glyceria maxima</i>
A Rhododendron	<i>Rhododendron</i> sp.
Rough Meadow-grass	<i>Poa trivialis</i>
Sessile Oak	<i>Quercus petraea</i>
Shining Crane's-bill	<i>Geranium lucidum</i>
Silver Birch	<i>Betula pendula</i>
Soft Rush	<i>Juncus effusus</i>
Sweet Chestnut	<i>Castanea sativa</i>
Sycamore	<i>Acer pseudoplatanus</i>
Turkey Oak	<i>Quercus cerris</i>
Water Figwort	<i>Scrophularia auriculata</i>
White Dead-nettle	<i>Lamium album</i>
Wood Avens	<i>Geum urbanum</i>
Yellow Iris	<i>Iris pseudacorus</i>



## QUALITY ASSURANCE

TITLE: Spa Ponds Nature Reserve, Mansfield, Nottinghamshire  
Ecology Report and Management Plan

SUBMITTED TO: Forest Town Nature Conservation Group

### ISSUE AND REVISION RECORD:

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A handwritten signature in black ink, appearing to read 'Will Sheppard'.

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A handwritten signature in black ink, appearing to read 'S. Ralph'.