

# Conserving Herefordshire's Ice Age Ponds

August 2019

## Pond Survey and Management Plan

Pond F - Hedgerow Pond, Sturts  
South, Herefordshire Wildlife  
Trust Reserve

**Herefordshire**  
Wildlife Trust



Herefordshire Amphibian  
& Reptile Team



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## 1. Site Details

### 1.1 Pond location/ name

Hedgerow Pond or Pond F or Wooded Ditch Pond. Sturts South, Herefordshire Wildlife Trust reserve, Letton Parish.

### 1.2 Grid Reference

SO 3352 4763

### 1.3 Ownership and Management Responsibility

Owned and managed by the Herefordshire Wildlife Trust, c/o Queenswood Country Park & Arboretum, Dinmore Hill, Near Leominster. HR6 0PY Tel 01432 356872. Main contact: James Hitchcock, Estates Senior Manager [j.hitchcock@herefordshirewt.co.uk](mailto:j.hitchcock@herefordshirewt.co.uk)

### 1.4 Designations and Countryside Stewardship Agreements

Designations: Site of Special Scientific Interest. Countryside Stewardship agreement, however, the ponds are not being managed through the CS agreement??

## 2. Project Background

This management plan has been created as part of the “Conserving Herefordshire’s Ice Age Ponds” project. This is a partnership project between Herefordshire Wildlife Trust, Herefordshire Amphibian and Reptile Team and Hereford and Worcestershire Earth Heritage Trust and has been supported by the National Lottery Heritage Fund and The Kingspan Insulation Community Trust.

During the last ice age, 27,000-18,000 years ago, the landscape of north-west Herefordshire was dramatically changed when a large glacier spread across from the Welsh hills, melted and retreated. As the glacier melted, sections of ice were left behind within lots of debris created by the glacier. These blocks of ice slowly melted, leaving behind deep depressions, known as kettle holes. Many of these depressions filled with water to form kettle hole ponds that survive to the present day.

These ponds have existed within the landscape of Herefordshire for over 15,000 years and are important both geologically and for wildlife. They are a nationally rare feature and a haven for a wide variety of plants and animals to survive including some rare and protected species of plants and animals.

Many kettle holes have been lost through infilling and ploughing out and many more are under threat through inappropriate management and a lack of awareness of their history, importance and value.

## 3. Pond Description

### 3.1 Pond Dimensions

The pond is 30 x 18 metres with an area of approximately 280 m<sup>2</sup>

### 3.2 Site Description

The pond is located beneath one of the mature field hedgerows on the Sturts, South. It is at the point where several fields and their hedges join. A broad drainage ditch, now dry, is located along the hedge. Both the pond and ditch are overhung by trees and shrubs; they straddle both sides of the pond. As a consequence it is heavily shaded and the water is obscured from vision with the exception of a narrow strip of open water on its eastern edge. The pond is dominated by a large veteran Pedunculate Oak *Quercus robur* growing on its eastern edge. Elsewhere as viewed from the east there is an interlocking tangle of Grey Sallow *Salix cinerea*. None of the pond is visible from the any other direction due to the denseness of trees and shrubs. There is fence on the western boundary. Beneath the canopy there are groups of multi-stem Grey Sallow and a very large Crack Willow *Salix fragilis* branch has fallen across the pond and re-grown. A broad field ditch flows into the pond from the northeast. The surrounding land use is unimproved flower-rich meadows. The land is flat and subjected to flooding. The profile of the pond is saucer-shaped.

### 3.3 Pond Geology, soil and substrate

The Sturts Nature Reserve is low relief land, just above the floodplain of the River Wye. It is overlain by Devensian glacial sediments and glaciolacustrine (glacial lake) deposits and has many small shallow kettle hole depressions [Lidar Map of area]. The depressions were formed by ice blocks discharging into a glacial lake and subsequently becoming grounded in the shallow water and then the remains being buried in lake sediments. The ice continues to melt slowly after the lake drains, leaving behind these shallow depressions (Gurney et al. 2010). This mode of formation (ice blocks floating away from the glacier) contrasts with the buried stagnant ice associated with kettle hole formation elsewhere in Herefordshire.

Many of these depressions now form seasonal or permanent ponds. Hedgerow pond is not typical of these depressions in that it does not have a clearly defined outline. It is thought that this pond has been heavily modified to extend it into a drainage ditch running NE-SW and possibly into several fields to provide water for grazing livestock. The presence of many other kettle holes in the

surrounding area, many of which have been depend to create perennial ponds suggests that Hedgerow pond is also a kettle hole, although the features associated with this are no longer clearly identifiable.

The soft silt on the base of the pond close to its centre was measured at 16 cm. The substrate beneath this is hard and compacted clay layer. A thin layer of dead and decaying leaves rests of the silt surface. The anaerobic layer is relatively thin.

### 3.4 Hydrology and Permanence

The pond appears to be on or close to the water table. As the surrounding land is flat it will receive less water from the its catchment. The water depth in the centre was measured 32 cm deep. The presence of fish suggests that it only dries up occasionally. The ditch to the northeast is semi-permanent and flows from west to east with a very gently fall. There was a few centimetres of water present at the time of survey. The old ditch to the south is dry, however, this will fill with water in winter. It is no longer expected to be an effective drain.

The water was tested on 9/5/2019 and 29/5/2019. The pH and Electrical Conductivity (EC) were very similar on both visits (pH 6.68 and 6.66 and EC 314 $\mu$ S/cm and 330 $\mu$ S/cm respectively). The phosphate levels within the pond were 0.08ppm (80 $\mu$ g/l) and 0.35ppm (350 $\mu$ g/l) respectively.

The Freshwater Habitats Trust defines a minimally impaired pond as having an EC of less than 500 $\mu$ S/cm and soluble reactive phosphorus of 0-100 $\mu$ g/l, when measured in late winter/ early spring (Freshwater Habitats Trust 2013). Although the earliest reading was taken in late spring, it is thought that this result (80 $\mu$ g/l) better represents water quality within the pond, as it matches that of several other ponds within the area, so the water quality within this pond is naturally nutrient rich (eutrophic) and is minimally impaired by pollution.

### 3.5 Pond history and past management

It is likely that the straight lined field boundary and ditch were constructed at the same time and that the pond was incorporated into the ditch and boundary. When draining and improving land for agriculture, this avoids the need to infill ponds. The pond itself is possibly a stock pond. as it is located at the intersection of several fields. It appears to have been dug out as there is an obvious cut bank to the pond to its west. The trees located around the pond have in the past been pollarded, but pollarding may have taken place over 50 years ago.

### 3.6 Current Management (in last 12 months)

There has been no recent management to this pond.

### 3.7 Pond problems

The pond is very shaded. This restricts its potential to support aquatic plants and their associated macro-invertebrate communities. Shade reduction would greatly improve the quality of this pond.

## 4. Detailed Survey Results

### 4.1 Date of Survey

5<sup>th</sup> May 2019 and 29<sup>th</sup> June 2019

### 4.2 Amphibians

The pond supports a healthy breeding population of Common Frogs *Rana temporaria*. No other species of amphibian was recorded. The presence of fish is likely to restrict other amphibian species

### 4.3 Mammals

None recorded

### 4.4 Birds

None recorded

### 4.5 Fish

Three-spined Stickleback *Gasterosteus aculeatus*

### 4.6 Invertebrates and their status

**18** species of aquatic and wetland plants were recorded of which **13** are listed by the Freshwater Habitat

#### 1.1 Invertebrates and their status

We recorded **29** species of aquatic invertebrates from the pond from the 2 field visits. **23** of those species are included within the macro-invertebrates groups recorded to species level by the Freshwater Habitats Trust.

On 9<sup>th</sup> May **Mud Snail** *Omphiscola glabra* was recorded in Pond F (see Photo 4). It is now classified as Near Threatened by the **IUCN, Vulnerable** (formerly RDB") in the UK Red Data Book and is a Section 41 Conservation Priority Species under the UK BAP.

### 4.7 Plant communities and botanical status

**18** species of aquatic and wetland plants were recorded of which **13** are listed by the Freshwater Habitats Trust. Fine-leaved Water dropwort *Oenanthe aquatica* is considered a local species. The pond is of Moderate value for aquatic plants Trust. Fine-leaved Water dropwort *Oenanthe aquatica* is considered a local species. The pond is of **Moderate** value for aquatic plants.

### 4.8 Amphibian Terrestrial Habitat

The surrounding terrestrial habitat is good

## 4.9 Comments and Summary (Pond Status)

This pond is located within the Sturts SSSI and management work may need to be agreed with Natural England before being carried out.

## 4.10 Photos



**Photo 1: The east margin with emergent flote-grass and Hemlock Water Dropwort beyond**



**Photo 2. Dense shade beneath the Grey Sallow canopy**





**Photo 3: The collapsed Crack Willow branch extending across the pond**



**Photo 4: Mud Snail from Pond F**

## 5. Management plan (short-term)

### 5.1 Tree management

#### 5.1.1 *Pollard Crack Willows*

##### **Management task for Contractors**

- Pollard the 2 split trunks of the collapsed Crack Willow pollard on the west side of the pond.
- Remove the Crack Willow branches which have collapsed across the pond (see Photo 3). The largest of these is 30 cm in diameter.
- Remove the small Crack Willow on the island in the middle of the pond.
- Remove the misshapen, collapsed Crack Willow on the east side of the pond. Felling above the water and then treating with herbicide may be the best option.
- Remove the young Crack Willow growing on the upper pond bank next to this tree (see plan).
- All cut material should be removed from the pond, including small branches and twigs as they can easily regrow. The wood can be taken off site. Smaller branches and twigs could be chipped or burnt.

##### **Timing of work**

After the bird breeding season, from September to early November (to tie in with herbicide treatment). Ideally choose a working period when water levels are low.

##### **Management objectives**

- To prolong the life of the old pollard on the west side of the pond.
- To retain the tree on the island as a feature.
- To let more light into the pond. This will open up the pond and promote the growth of aquatic plants, creating favourable conditions for aquatic invertebrates.

##### **Other considerations**

A H & S plan will be written.

#### 5.1.2 *Fell Grey Sallows*

##### **Management task for Contractors**

- Fell the three multi-stemmed Grey Sallows on the north side of the pond.
- Stems should be cut 15 cm above the pond surface. as shown on the plan and Photo 2
- All cut material should be removed from the pond, including small branches and twigs as they can easily regrow. The wood can be taken off site. Smaller branches and twigs could be chipped or burnt.

##### **Timing of work**

This work should be carried out after the bird breeding season, from September until the beginning of November (to tie in with herbicide treatment). Ideally choose a working period when water levels are low.

### **Management objective**

- To let more light into the pond. This will open up the pond and promote the growth of aquatic plants, creating favourable conditions for aquatic invertebrates.

### **Other considerations**

- A H & S plan will be written.
- Before the work is carried out, mark specimen trees to be retained.
- Priority 1

#### *5.1.3 Herbicide treatment of tree stumps*

### **Management task for Contractors**

- Do not treat the coppiced Hazel
- Do not treat the Crack Willow pollard on the west side of the pond.
- Treat all the other Crack Willow and Grey Sallow stumps with the systemic herbicide Glyphosate by drilling into each butt end and applying the herbicide.

### **Timing of work**

This work should be carried out in November before the sap rises and after the leaves have fallen.

### **Management objective**

- To permanently remove the coppice stools to ensure that the pond remains open for the next 20 years.
- To reduce the amount of future management required and keep the pond on a more sustainable footing.

### **Future management**

- Inspect the treated tree stumps in the summer the following year and mark and record those which require re-treatment.
- Re-treat those stumps again in November.
- HWT should monitor the site for the next 20 years looking for natural regeneration in the treated areas. Apply herbicide to young trees which have naturally recolonised these areas.

### **Other considerations**

- A H & S plan will be written.
- The treatment is not usually 100% effective, therefore the site must be monitored for regrowth. Further herbicide treatment should be carried out in the following season as and when required.
- The work should be carried out by a contractor licensed for this activity.
- Priority 1

#### *5.1.4 Trim overhanging branches*

### **Management task for Contractors**

- Trim the remaining branches overhanging the pond; with the exception of the larger limbs higher up on the veteran Oak and the surrounding Crack Willows.

- Branches and twigs could be chipped or burnt.

### **Timing of work**

After the bird breeding season, from September to early November. Ideally choose a working period when water levels are low.

### **Management objectives**

- To let more light into the pond. This will open up the pond and promote the growth of aquatic plants, creating favourable conditions for aquatic invertebrates.

### *5.1.5 Coppice Hazel*

#### **Management task for Contractors**

Coppice the Hazel on the west side of the pond on its upper bank.

The wood can be taken off site. Smaller branches and twigs could be chipped or burnt.

### **Timing of work**

After the bird breeding season, from September to early November.

### **Management objectives**

To allow more light onto the pond from the important southside of the pond.

### *5.1.6 Remove fallen branches from the pond base*

#### **Management task for Volunteers**

- After the main tree management operations on the pond, remove any remaining branches and twigs from the base of the pond by hand.
- Branches and twigs should be chipped or burnt. It is important not to leave them where they could regrow.

### **Timing of work**

This work should be carried out soon after the main tree and shrub management works.

### **Management objective**

To prevent regrowth of Crack Willow and Grey Sallow from fallen branches. This will increase the effectiveness of the pond management and reduce the amount of future management work needed.

### **Other considerations**

- It is estimated that this task might take a day with 5 volunteers.

Priority 1

## 5.2 Estate fabric work

### 5.2.1 *Erect a new section of fence to protect the pond*

#### **Management task for HWT/contractors**

- Erect a new section of fence to protect the pond from stock during its restoration. It is estimated the length is 40 metres.

#### **Timing of work**

This work should be carried out after the completion of main tree and shrub management works.

#### **Management objective**

To prevent stock grazing off the re-regrowth of establishing aquatic plants.

#### **Other considerations**

- The fence should be left in situ for at least 2 years and can then be removed so that stock can graze the site to restrict tree growth.
- Priority 1

## 5.3 Other tasks

### 5.3.1 *Test water for Phosphates*

#### **Management task for Volunteer/contractors**

- After pond clearance work measure Phosphate levels within the pond.

#### **Timing of work**

- Late winter/ early spring after the pond clearance work has taken place and pond sediment has settled.

#### **Management objective**

To ensure that there is no incoming source of phosphate pollution to the pond.

#### **Other considerations**

- Volunteer would need to be trained to use phosphate meter
- Priority 1

### 5.3.2 *Extend pond along ditch*

#### **Management task for Volunteers**

- After the tree management operations, volunteers could extend the pond along the old ditch line to the south. It is suggested that it is extended by just 2 metres, keeping the same shallow profile.
- The spoil can be disposed of beneath the canopy of trees to the south without taking it off site, as it is only 2 cubic metres of spoil at the most which will be removed.

- Spoil should not be piled too near the base of existing trees.
- It is important not to cut into the solid geology, so that the original ditch profile is retained.
- Marginal aquatic plants in the area should be rescued beforehand and then returned to the site.

### **Timing of work**

- After the felling operations
- Ideally in late summer or early autumn when water levels are low.

### **Management objective**

To create a further area of open water in an area which receives some direct sunlight.

### **Other considerations**

- This task should only be carried out if after phosphate levels have been measured and only if they are found to be less than 0.10ppm (100µg/l) as extending or clearing the ditch will increase water entering the pond and could increase the phosphate levels.
- It is estimated that this task might take a day with 10 volunteers.
- This work will need to be carried out with a geologist on site, just to ensure that the base layer of the pond is not damaged.

Priority 2

## 6. Management plan (10 year)

**Programme of Works 2020 – 2030 – Pond F, Sturts, South**

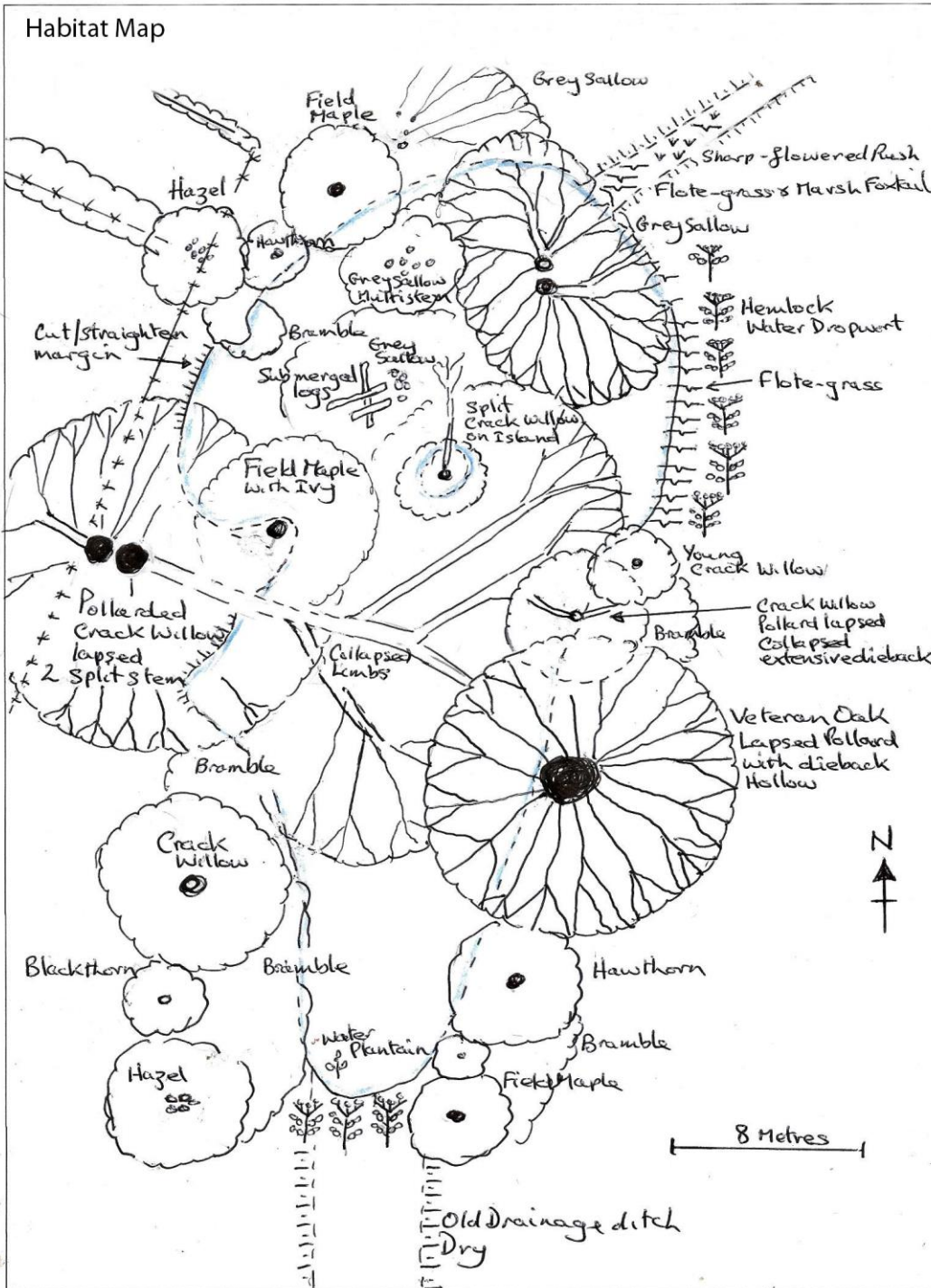
Date →			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Task ↓	Timing	Workforce											
<b>Pollard Crack Willows</b> 2	October to January	Contractor	X					X					X
<b>Remove cut branches</b>	October to January	Contractor	X					X					X
<b>Fell 3 multi-stem Grey Sallows</b>	October to November	Contractor	X										
<b>Remove misshapen collapsed Crack Willow</b>	October to November	Contractor	X										
<b>Trim overhanging branches</b>	October to January	Contractor	X	X				X					X
<b>Coppice hazel</b>	October to January	Contractor	X	X				X					X
<b>Remove remaining twigs and branches</b>	October to January	Volunteers	X	X				X					X
<b>Treat stumps with herbicide</b>	November	Qualified contractor	X										
<b>Review herbicide work</b>	April to June	Project Manager		X									

Date			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Task	Timing	Workforce											
Extend pond to south for 2 metres along the old ditch	When dry in Summer	Volunteers		X									
<b>Review all work</b>								X					X



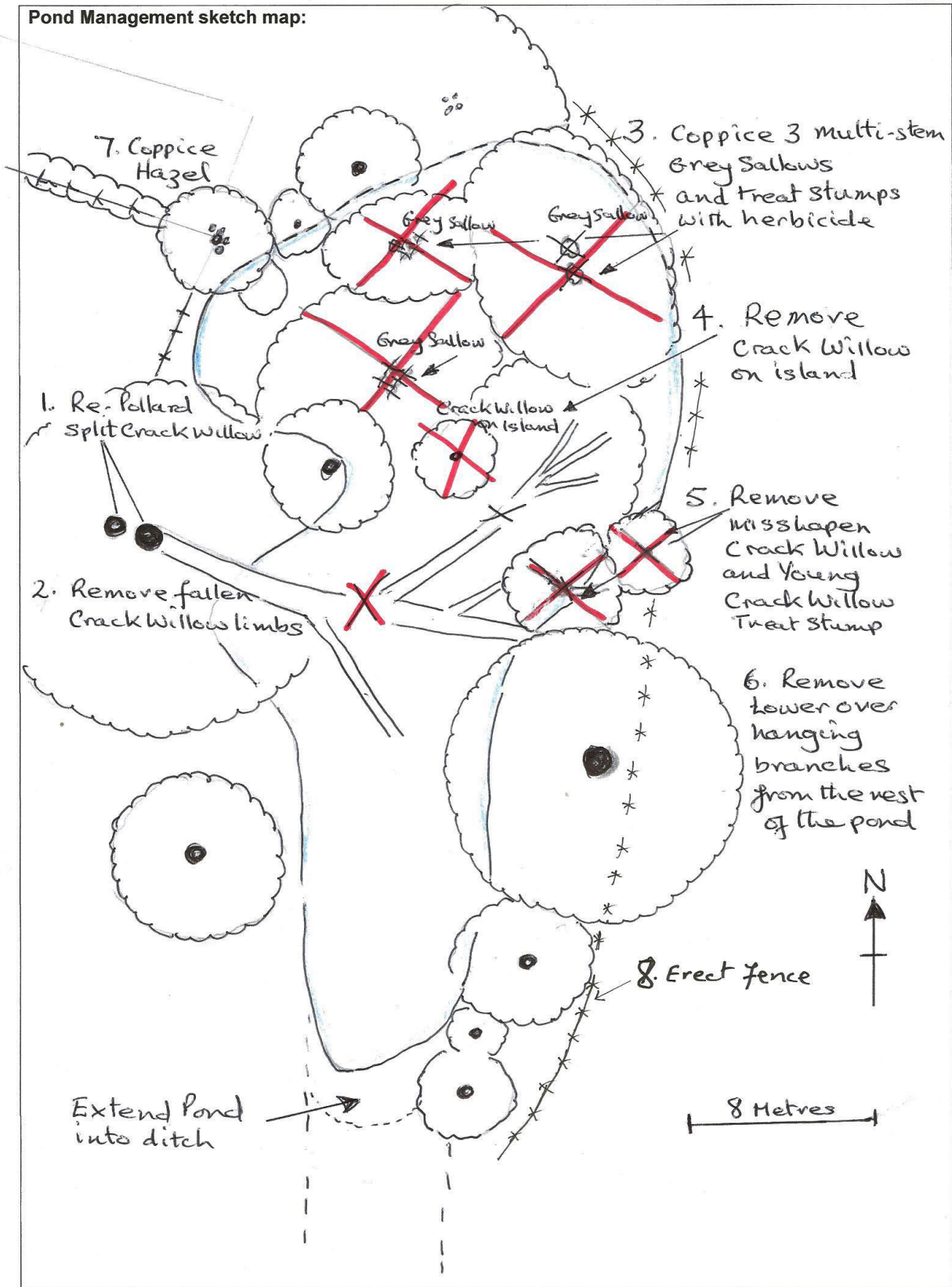
# 7. Habitat and Management plans

## Kettle Hole Pond Survey Form Pond F, Sturts, South



# Kettle Hole Pond – Pond F, Sturts, South

Pond Management sketch map:



## 8. References

Freshwater Habitats Trust (2013) Assessing whether a pond is polluted – complete new design – 2. FAQs: How do I assess and manage pollution in ponds? [www.freshwaterhabitats.org.uk](http://www.freshwaterhabitats.org.uk) [retrieved 8/8/19]

Gurney, S., Astin, T. and Griffiths, G. (2010) Origin and structure of Devensian depressions at Letton, Herefordshire. *Mercian Geologist* **17** (3), 181-184.

Watson, W. R. C. (2003). Pond & Stream Survey Report Herefordshire Nature Trust (Available from the author.

## 9. Appendices