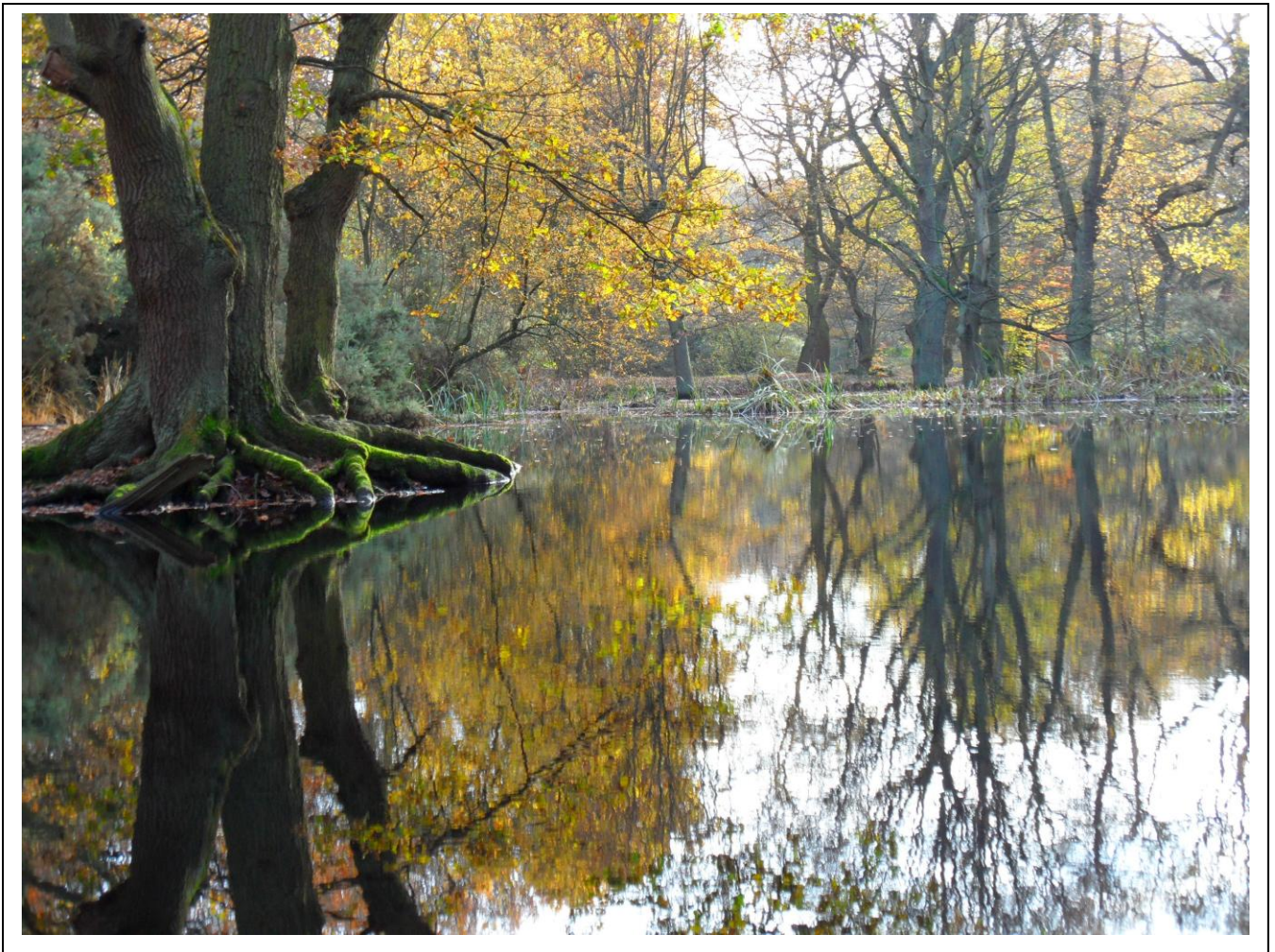


Appendix 2

Sandy Heath Ponds management work plan

Adrian Brooker

2012

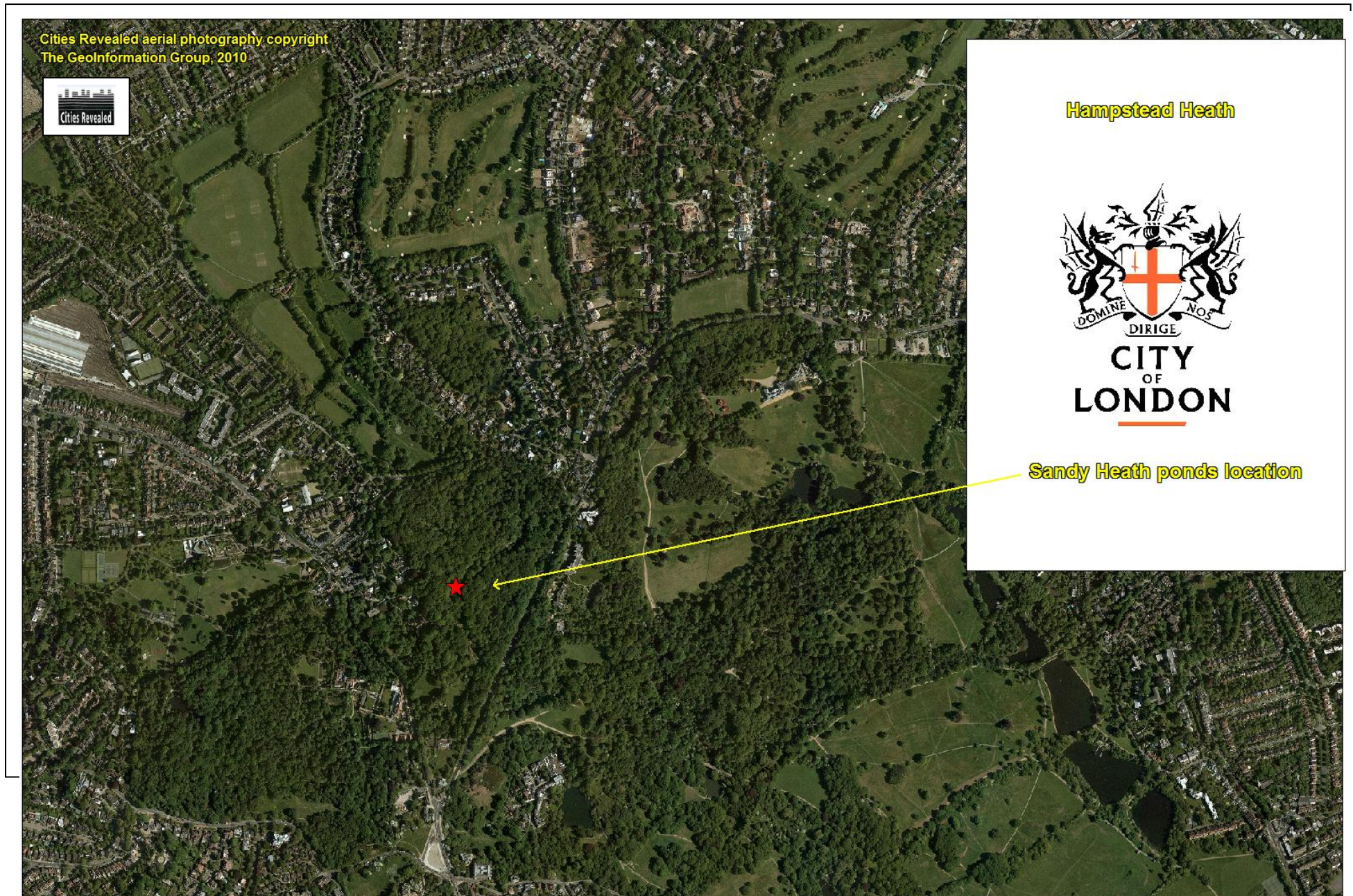


Sandy Heath ponds Management Work Plan

April 2012

1.0. Site description

Figure 1: Sandy compartment location



1.1 Location

The Sandy ponds are located towards the north-west of Hampstead Heath near to Spaniards road. The centre of the main Sandy pond (No.2) is at grid reference 526,316; 186,950 and the compartment covers some 1.15 hectares. The 2009 Hampstead Heath vegetation survey shows the area as being mostly within compartment numbers 1,184 through to 1,186.

The compartment boundary can be seen in figure 5 and is bordered by a made (metalled) pathway then woodland to the north, houses to the west behind a fenceline and woodland to the eastern side leading up to a main road. The southern boundary is a mixture of gorse, woodland, and further south an open meadow.

The main routes to the pond are via the made pathway to the north leading to Spaniards road in one direction and north end way the other. A well used desire route runs to the east of the ponds, running south towards the Jack Straw's end of Spaniards road.

The ponds are not fenced and are accessible along most of their lengths.

The ground surrounding the ponds has an undulating topography largely due to previous sand extraction in the area.

1.2 Geology, Soils, Hydrology

The Sandy ponds are located on an area of Bagshot sand. Although sand is usually very permeable the ponds are formed on an Iron pan¹ and are not spring or stream fed. As Bagshot sand has very heavy iron content, iron oxide has helped in transforming the sand into a hard crust of sandstone.

The main No.2 pond is the deepest at up to 0.6m in places with the others suffering from seasonal drying out, often containing no standing water.

1.3 Ecology

The habitats within the compartment largely consist of 4 ponds or pools with large shading trees surrounding them. A small area of acid grassland is also present adjacent to No.4 pond. The area available for acid grassland species is limited by the presence of the surrounding tree cover. The ground under the tree cover is largely barren although small amounts of wavy hair grass survive in places. The area surrounding the main No.2 pond is particularly bare due to shade and the erosive effects of visitors. The distribution of some of these habitats is shown in figure 5 in section 3.0.

General pond information

Pond 1: 275 sq.m. A shallow pond with yellow flag iris, bogbean and reed sweet grass. The pond often has a covering of duckweed and has a number of coppiced sallows along its bank.

Pond 2: The largest of the Sandy ponds covering 1720 square metres. There is a large amount of shading tree cover with a stand of semi-mature oaks growing in the water to the southern end. A small area of emergent/marginal flag iris is present along eastern edge. A band of common gorse also grows along the eastern edge interspersed with sapling birch trees. An island of iris exists to the south of the pond with a number of young birches growing from the centre. The pond is frequently covered with greater duckweed throughout the summer. Rudd and smooth newts have been recorded in the pond. A heron is often present and up to 40 mandarin duck have previously been recorded in the winter months.

Pond 3: 106 sq.m. This pond is often merely a muddy crater and is very shaded with no emergent vegetation.

Pond 4: 380 sq.m. This pond has a relatively open aspect, and is heavily vegetated with soft rush, iris and bogbean. Azolla commonly covers the water surface. An uncommon and interesting liverwort species *Riccia fluitans* is also present in the pond. Bog myrtle has been planted around the edge of this pond and coppiced sallow is frequent to the western edge. This pond is also a major breeding ground for common frogs with up to 300 clumps of spawn having been recorded here.

Flora

A variety of flora is associated with the area including plants deliberately introduced including bog myrtle and creeping willow and invasive floating aquatics such as azolla and duckweed.

Bogbean and flag iris are common in and around the ponds, with bogbean covering large areas of No.1 and No.4 ponds.

Other marginal plants of interest found include trifid bur-marigold, gipsywort and marsh cinquefoil. Large amount of soft rush grow in the No.4 pond as does an uncommon and interesting liverwort species² *Riccia fluitans*.

Wavy hair grass occurs in small patches in the brighter areas surrounding the pond and in the wider Sandy area as does a small patch of heather on the margins of the No.1 pond. A larger patch of grassland is located to the south of the No.4 pond which was previously scrub in 2008.

Pyramidal orchid was found in 1997 and 1999 but has not been recorded since.

Fauna

The Sandy ponds have been a major breeding ground for frogs. The frog spawn records show 300 clumps in 2007; 231 in 2008; 210 in 2009; 160 in 2010 and 111 in 2011. The majority of this spawn was found in the No.4 pond. This decline is possibly due to a drying out of the pond as vegetation expands.

Lots of smooth newt adults were found during duckweed removal in 2008 on the large Sandy No.2 pond.

Grey wagtails are often seen around the main pond edge and a heron often fishes on the pond. In the winter months up to 40 mandarin ducks have been observed on the ponds.

A dozen or so native rudd were found during duckweed removal in 2008 and occasional introductions of goldfish species have occurred.

Seven species of dragonfly have been recorded on the ponds during monitoring work in 2007 and 2008. Those were the large red damselfly, azure damselfly, southern hawker, emperor dragonfly, common darter, blue-tailed damselfly and brown hawker. Exuviae of southern hawker dragonflies were found in both years proving recent breeding.

According to Alan Reynolds the presence of duckweed and North American water fern will act as a significant deterrent to dragonflies as will a lack of open water in general. (Alan Reynolds³)

The following invertebrate information is from City commissioned reports carried out by Dan Hackett⁴ Three Nb species of invertebrate (*Cercyon sternalis*-water scavenger beetle, *Chaetarthria seminulum*-a tiny water beetle and *Enochrus melanocephalus*- a water beetle which frequents silt ponds) have previously been recorded from the Sandy Heath ponds during survey work). An Nb species is one which is found in only 31-100 Km squares nationally. A 4th Nb species *Oxypoda spectabilis*-a rove beetle has also been recorded but no information as to the location is given.

According to a survey carried out by invertebrate specialist Dan Hackett in 2006 *Geotrupes pyrenaicus*, a Notable A species (Na: found in less than 40 10Km squares nationally), has been found in dry sandy places on the Heath. This and other species such as the minotaur beetle and robber-flies would benefit from more dry, sunny sparsely vegetated habitat which can be found on sandy soils such as around the sandy ponds. It is thought that full tree cover now present on the majority of the site has been detrimental to the invertebrate fauna which was once considered one of the best in London in 1948 (Hackett, 2006).

1.4 Public and educational uses

The ponds although lightly visited are used by dogs to swim in. The adjacent areas are often used by bike riders contrary to Byelaws. The area has been used to film in due to its attractive setting.

1.5 History

The topography of Sandy Heath is largely the result of extensive sand digging. According to Farmer (1984⁵) in 1867 30 cartloads of sand a day were being removed from Sandy Heath and some of the sand pits were 25ft deep before this part of the Heath became public property in 1871. The sandy road running adjacent to the ponds was closed to motor traffic in 1924.

Figure 2: Photograph of the Sandy Heath area in 1867. Credit Hampstead Museum/Burgh house



The photograph in Figure 2 above is believed to show the Sandy Heath area looking towards the firs near the Spaniards Inn after sand extraction from the area.

Although difficult to be sure, the image in Figure 3 below is believed to be of a similar location with Spaniards road on the right in both images. This image shows the area beginning to develop trees and scrub.

Figure 3: Old postcard image believed to be of the Sandy Heath area. Courtesy of Michael Hammerson.

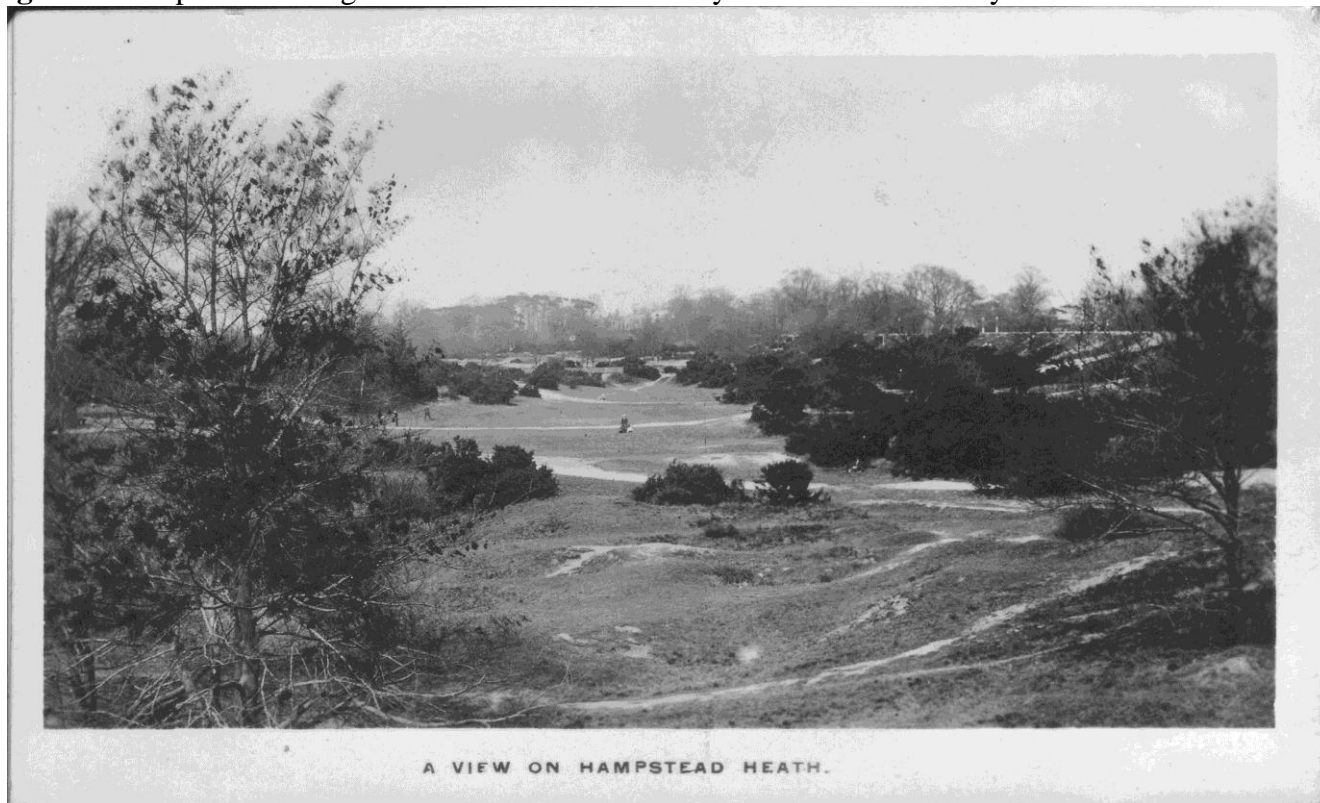
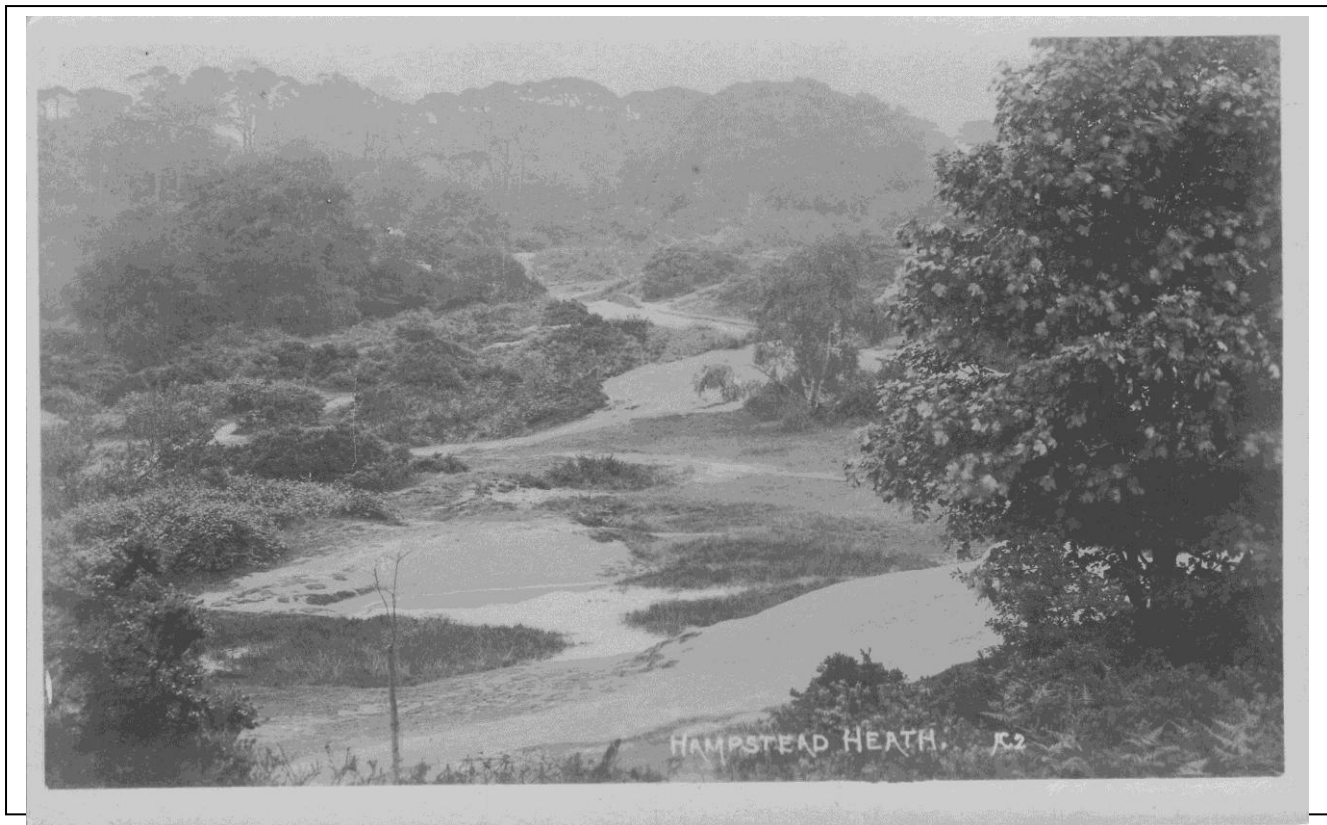


Figure 4 below, although also difficult to confirm, is believed to be of the Sandy Heath area and shows a small pool in the foreground along with open areas of grassland and bare ground. Although already in the process of scrubbing up, this type of habitat is the kind suitable for some of the specialist invertebrate associated with sandy soils mentioned in section 1.3

Figure 4: Old postcard image believed to be of the Sandy Heath area. Courtesy of Michael Hammerson.



Selected coppicing has taken place around the ponds in recent years and scrub encroachment regularly abated. An area of grassland was created adjacent to No.4 pond in 2008 through the removal of scrub and tree cover. Bog myrtle and creeping willow were introduced to No.4 Sandy pond in the 1990's.

The north most section of Sandy No.2 pond was cleared of sediment accumulation by an external contractor in April 2012.

1.6 Natural and human-induced trends

Apart from the main No.2 pond the others suffer from seasonal drying out, and often contain no standing water.

1.7 External influences

There is quite a large amount of off-road biking that goes on in the adjacent area and although the effects on the ponds are minimal there is likely to be some erosion problems in the surrounding grassland.

2.0. Evaluation

2.1 Natural landscape

The geology of the Sandy ponds area is one of Bagshot sands which tend to result in free draining soils and acidic conditions which are typical conditions for the development of acid grassland and heathland species. These conditions are found only on limited areas of the Heath and form a distinct flora of plants such as wavy hair grass. A reduction in tree cover would be beneficial for the development of acid grassland and the lighter vegetated conditions suitable for fauna such as robber-flies. This reduction would also allow further emergent pond vegetation to develop.

There is a great deal of tree cover adjacent to the Sandy ponds but selected non-native species such as turkey oak could be removed to provide conditions for grassland to develop. This would also reduce the sediment build up from leaf litter in the ponds themselves. It may be however that other locations within the Sandy Heath area may be better suited for the initial development of acid grassland. The mature native trees surrounding the ponds should remain but natural processes may allow for future pond or grassland development.

The Sandy ponds are unique on the Heath as they have arisen in geological conditions which would not normally be associated with wet conditions. They provide habitat for amphibians and dragonflies and should not be allowed to completely infill with vegetation or sediment. Sandy pond No.4 currently provides conditions suitable for over 100 spawning female frogs and is one of the major breeding sites on the Heath despite its small size.

Alan Reynolds (2007) believes that with the removal of duckweed, water fern and the creation of more open water then it may be possible to attract blue-tailed and common blue damselflies and the dragonfly species migrant hawkler and ruddy darter.

2.2 Public and educational uses

The Sandy ponds are located in an attractive setting but the continued use of the area for biking is detrimental to the ground flora and scrub layer in the adjacent area. Many large logs and branches are thrown into the Sandy ponds, but the use of the ponds by dogs is not thought to be having a significant detrimental effect at this time especially as the surrounding tree growth restricts the growth of marginal vegetation

2.3 History and built environment

The history of the ponds being in an area where sand and gravel were extracted is of interest. The ponds are thought to been created from marshland some 40 years ago. This continuity of ponds should remain and succession to marsh should be prevented. Care should be taken that any management work on the ponds does not damage the layer of iron pan and render the ponds unable to hold water.

2.4 Vision

To manage the ponds as shallow well vegetated pools providing habitat for in particular amphibians and dragonflies.

- Maintain the ponds to provide habitat for amphibians and emergent plants.
- Maintain open water particularly on No.4 pond.
- Improve the marginal vegetation in particular in No.3 pond.
- Maintain and increase the extent of acid grassland adjacent to the ponds.
- Reduce invasive floating aquatics such as azolla and duckweed.
- Coppice of bankside vegetation rotationally to prevent scrub encroachment.
- Aspirational reduction of shade from major trees particularly Turkey oaks.

2.5 Relevance to achieving the 2007-2017 Hampstead Heath Management Plan

Overriding Objectives, Essential Actions and Aspirational Goals from Part I of the Hampstead Heath Management Plan which are particularly relevant to the management of the Sandy Heath ponds are as follows:

- HY1** Manage the Heath's ponds and watercourses to enhance their nature conservation value, reduce flood risk and address water quality problems.
- NL4** Manage the Heath's woodlands and scrub to enhance their nature conservation value and improve their distinctiveness
- NL5** Manage the Heath's ponds to enhance their nature conservation value.

The following policies from the Natural Landscape chapter of the Part II Management Plan for the Heath are particularly relevant to the Sandy Ponds

Policy 1: The Heath will be managed to maintain and preserve its unique wild and natural aspects and its ecology, and enable quiet enjoyment and appreciation of the natural world by visitors

Policy 13: The existing areas of acid grassland and heathland, including heather and gorse, will be managed to protect and enhance their nature conservation importance

Policy 14: The areas of acid grassland and heathland, including heather and gorse, will be extended where possible

Aspirational Policy 15: Areas of acid grassland and heathland, including heather and gorse, where appropriate will be restored and extended as functioning, sustainable habitats

Policy 34: The spread of scrub will generally be limited and will be managed to prevent it becoming woodland

Policy 36: The existing ponds, streams, ditches and wetlands will be managed to protect and enhance their nature conservation importance

Policy 38: A range of pond plants will be reintroduced to as many ponds as possible. Work will initially trial various planting techniques and will be on a phased basis in accordance with priorities set by the overall strategy for ponds and watercourses

Policy 39: Opportunities will be sought to reduce shading of ponds by bank-side trees and shrubs and thereby enhance the visual amenity of some ponds, improve water quality, facilitate the growth of marginal flora and encourage dragonflies and other fauna

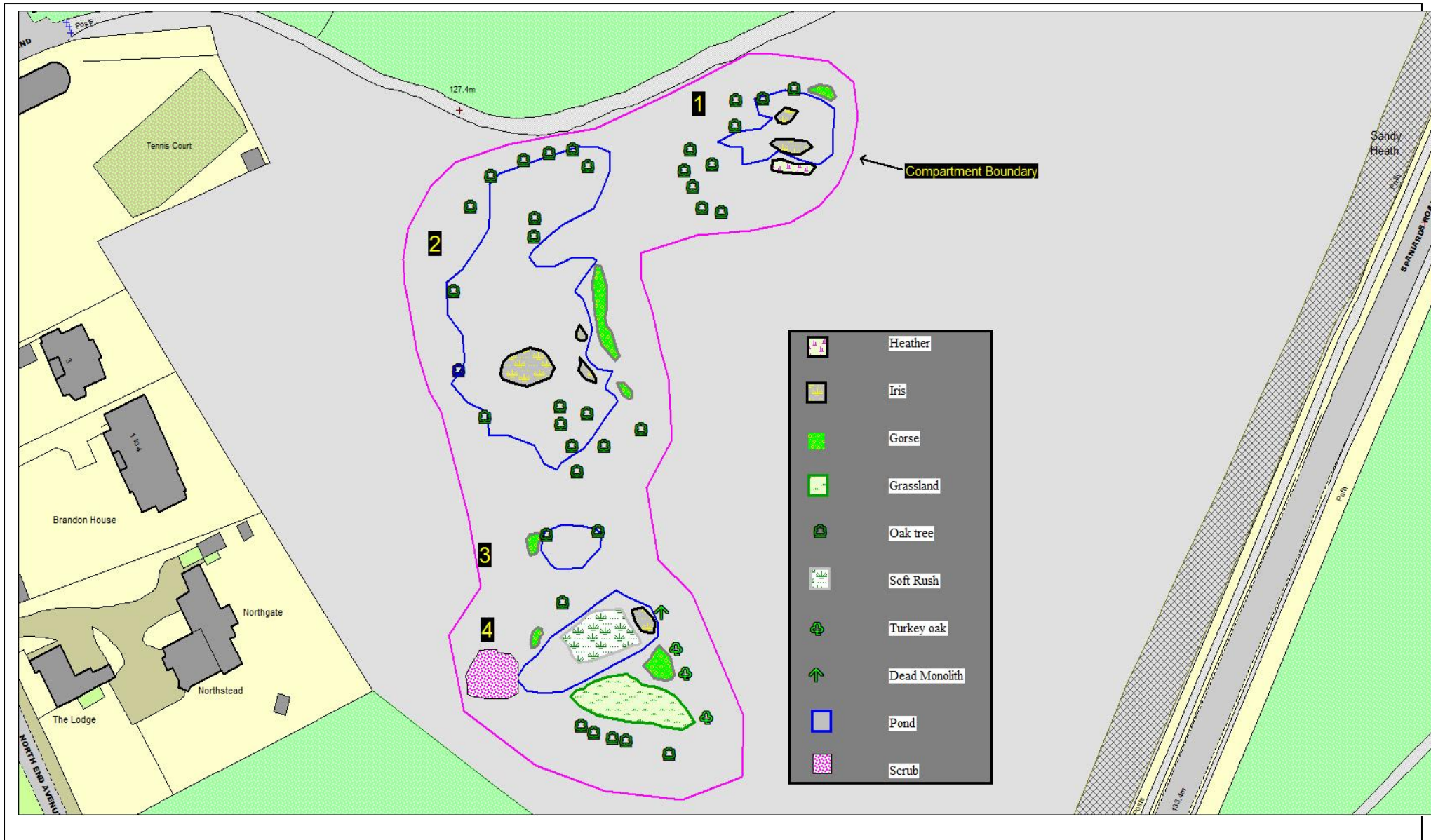
Policy 41: Ponds will be dredged as and when necessary

Policy 46: Populations of plants and animals protected by law, identified as being Priority Species in national and local Biodiversity Action Plans, or subsequently identified as worthy of protection will be protected and enhanced

Policy 50: Selected invasive and inappropriate species will be controlled

3.0 Prescription and Work Programme

Figure 5: Sandy habitats and prescription






3.1 Regular management tasks

Objective	Prescription	frequency	Month(s)	Years	Who by	Priority: low, medium or high
Remove duckweed	Boom and net duckweed from pond No.2 surface when covering greater than 25% of pond surface.	As required	Summer	As and when	Cons Team	Medium
Remove Azolla	Trial the removal of azolla through the application of the azolla weevil. This introduction should only be applied once the azolla has established large patches.	As required	Summer	As and when	Ecologist/ Ranger team leader	Medium
 Maintain extent of acid grassland.	Cut Grassland area adjacent and south of No.4 pond. Remove arisings.	Twice in year	May + August	Yearly	Cons Team	Medium
Rotational coppice of bankside vegetation.	Selectively coppice or remove tree/gorse and scrub cover from the edge of No.1 pond to prevent shading and establishment of large trees.	Every 4 years	Winter	2015	Cons Team/ Volunteers	Medium
	Selectively coppice or remove tree/gorse and scrub cover from the edge of No.2 pond to prevent shading and establishment of large trees.			2014		
	Selectively coppice or remove tree/gorse and scrub cover from the edge of No.3 pond to prevent shading and establishment of large trees.			2013		
	Selectively coppice or remove tree/gorse and scrub cover from the edge of No.4 pond to prevent shading and establishment of large trees.			2012		
 Prevent scrub encroachment onto pond area.	Cut back scrub 3m from the pond edge west of No.4 pond.	Every 4 years	Winter	Yearly	Cons Team/ Volunteers	Medium
Maintain open water  Sandy ponds No's 1, 3 + 4	Remove selected vegetation and sediment to maintain open water and amphibian breeding habitat. Best carried out when low water levels. It is intended that this be	Minimum every 5 years.	June/July or Autumn	2012, 2017, 2022	Cons Team/ Ecologist/ Volunteers	High

	carried out manually. However this is subject to review and may require mechanical assistance.					
Amphibian Survey	Carry out amphibian survey on the 4 ponds	Twice	April-May	Yearly	Ecologist	Medium
Dragonfly Survey	Carry out dragonfly survey on the 4 ponds	Every 4 years	May-August	2014	Ecologist/ Contractor	Medium

3.2 One-off tasks

Objective	Prescription	Month(s)	Year	Who by	Priority	Est. cost
Maintain open water  Sandy pond No.2	Remove sediment from 25-50% of pond area. Remove sediment from selected areas every 10 years or sooner if required.	Early spring/autumn	2022	Cons Team/ Contractor	High	£1500 at 2012 prices.
Reduce shade from around pond no.3. Establish vegetation.	Remove small oak tree and willow growing adjacent to the pond. Soft rush from the adjacent no.3 pond may establish well in the improved light conditions. Currently there is no vegetation present.	Spring/autumn	2013	Cons Team	Low	Local Budget
Increase extent of emergent and aquatic vegetation in pond 2	Plant emergent vegetation into suitable less shaded areas on the pond margins.	September /October	2013	Cons Team	Low	Local Budget
For Review: Lift lower limbs of oak adjacent to pond 2 to allow planting and establishment of marginal vegetation. 	Lift lower limbs of native oak tree to the west of pond 2. Plant in iris along the pond fringes. A review of this should be carried out in 2013 as to the likely gain from this task.	Winter	2014	Cons Team	Low	Local Budget
For Review:  Aspirational Remove	Remove 2 large and 1 small Turkey Oak trees to increase extent of acidic grassland and reduce shade to area. Although they are non-native trees. This task	Winter	2013	Cons Team	Low	Local Budget

Turkey Oaks to reduce shade	should be reviewed prior to works as to the likely benefits to be gained.					
Remove trees from centre of large Iris bed in pond No.2 to prevent shading	Remove birch trees growing in the centre of the Iris bed.	Autumn/ Winter	2013	Cons Team	Medium	Local Budget

4.0 Review

To be filled in as time goes by.

Author	Date	Task	Observation, event or alteration to task

5.0 References

1. Wolton, D; McDowall, 1998; Hampstead Heath, The walkers guide. page18.
2. Field Bryology No.98 Jun 2009
3. Reynolds A 2007/08: H:\ecology\monitoring\odonata\Alan Reynolds work\dragonfly survey reports
4. Dan Hackett 2007. H:\ecology\Data on the Heath\other inverts\dan hackett\Reports 2007-8
5. Farmer A, 1984, Hampstead Heath, Historical Publications Ltd, page 94.