

2055

AN ECOLOGICAL SURVEY OF UXBRIDGE COLLEGE POND, LONDON BOROUGH OF HILLINGDON

REPORT TO HERPETOFAUNA INTERNATIONAL

Pond Action
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1. I N T R O D U C T I O N

This report describes the results of a survey of the aquatic plants and macro-invertebrate animals at Uxbridge College pond. The report gives an assessment of the conservation value of the pond and suggests recommendations for its future management.

2. B A C K G R O U N D

Uxbridge College pond lies in the northern suburbs of Uxbridge (TQ 071847) within the grounds of Uxbridge College. The pond lies about 300m south-east of Brearley Close pond which was described in an earlier report ('An ecological survey of Brearley Close Pond, Uxbridge': Pond Action Report, 10 March 1989).

3. M E T H O D S

The pond was surveyed on 19th and 20th June 1989 following a period of prolonged dry weather when water levels were very low.

Two scale sketch maps of the site were prepared to show:

- a) the extent of the main stands of vegetation within the pond (see Figure 1).
- b) depths of water and sediment in the pond (see Figure 2).

Wetland plant species (as defined in the Nature Conservancy Council survey card CST OW2 Second Edition) present in or near the pond were recorded, some material being taken back to the laboratory for identification.

Aquatic macro-invertebrates were collected from the small area of surface water remaining in the pond using a standard FBA pattern pond net (mesh size 1mm). Samples were sorted in the field and the site was sampled until no further taxa could be found.

Aquatic invertebrates collected were returned to the laboratory for identification. Taxa were identified to species level where possible.

4. R E S U L T S

4.1 PHYSICAL FEATURES OF THE SITE

The area of the pond was estimated to be about 1350 square metres. At the time of the survey, standing water was present just above the sediment surface, over an area of approximately 50 sq.m (less than 3.5% of the total area).

The geology of the site is similar to the Brearely Close pond. The pond lies directly on glacial sands and gravels which overly the

impermeable strata of the London Clay. Water levels in the pond are therefore likely to be predominantly controlled by the level of the water table. This water source is probably supplemented by surface and near surface run-off, from the College grounds, which enters the pond through a number of pipes in the outer bank.

Sediment depths are shown on Figure 2. The maximum depth of accumulated sediment, 55cm, is near the centre of the pond but accumulations of sediment are relatively shallow in most areas of the pond. Only in the centre of the pond, in the area bounded by points D, E, K, N and I (see Figure 2), did sediment depths reach 40cm or more.

When bank-full it is unlikely that there would be more than 50cm of water above the silt. The total volume of sediment was estimated (very approximately) to be 340 cubic metres.

4.2 WETLAND VEGETATION

Wetland plant species recorded in and around the pond are listed in Table 1. The main stands of vegetation are shown in Figure 1. A total of 17 wetland species were recorded.

The margin of the pond was dominated by trees and shrubs particularly crack willow (Salix fragilis) and grey willow (Salix cinerea). These and other trees exclude light from most of the margin of the pond.

The unshaded central area of the pond was dominated by large, near monospecific, stands of great pond sedge (Carex riparia), soft rush (Juncus effusus) and bittersweet (Solanum dulcamara). The three species show a clear zonation in relation to the degree of flooding of the sediment with C. riparia growing in the wettest sediments, S. dulcamara on the driest sediments and J. effusus forming an intermediate zone. The occurrence of large stands of S. dulcamara and J. effusus well inside the outer boundary bank of the pond suggest that water levels remain low for most of the year. This implies that there has been a general lowering of the water table in the pond.

The area of most diverse vegetation was the exposed sediment along the northern margin, near to the landing stage. This area supported a mixed stand of water starwort (Callitriche probably platycarpa), water crowfoot (Ranunculus probably aquatilis), reedmace (Typha latifolia), jointed rush (Juncus articulatus) and marsh yellowcress (Rorippa palustris). A single plant of flowering rush (Butomus umbellatus) was also growing on exposed sediment near to this area.

4.3 AQUATIC MACRO-INVERTEBRATES

12 species of aquatic macro-invertebrates were recorded from the small area of very shallow water in the centre of the pond (see

Table 2). It is likely that further species would be recorded during periods of higher water level.

The fauna included two species commonly associated with temporary waters, the ramshorn Planorbis leucostoma and the small diving beetle Coelambus confluens. Larvae of the screech beetle (Hygrobia hermani) were also found.

4.4 AMPHIBIANS

One great crested newt (Triturus cristatus) was found beneath a paving slab at the margin of the pond. Several smooth newts (T. vulgaris) and frogs (Rana temporaria) were also found beneath paving slabs.

5. ASSESSMENT OF THE CONSERVATION

VALUE OF THE POND

5.1 CONSERVATION VALUE OF THE PLANT AND MACRO-INVERTEBRATE COMMUNITIES

The existing plant and macro-invertebrate communities of the Uxbridge College pond are of low nature conservation value.

The pond supported a variety of widespread wetland plant species. One less common species, flowering rush, was also recorded but it is likely that this species had been introduced to the pond. Flowering rush is commonly available in water garden centres and was present as only a single plant in an area close to the landing stage.

At the time of the survey relatively few macro-invertebrate species were recorded, partly because very little water remained in the pond. However, it is unlikely that the pond would support a large number of species even when water levels were higher. The extensive shading of the margins of the pond and the domination of large areas by uniform stands of emergent plants, combined with the tendency of the pond to dry out, is likely to prevent the occurrence of a diverse macro-invertebrate community. When bank-full it is likely that the Uxbridge College pond would support a similar number of species to Brearely Close pond.

Although Uxbridge College pond is neglected it has the potential, with suitable management, to become a pond of at least intermediate nature conservation value (see Pond Action report 'An ecological survey of the Ickenham Ponds, London Borough of Hillingdon', 6 July 1989, for definition of low, intermediate and high nature conservation value).

5.2 CONSERVATION VALUE OF AREAS WITHIN THE POND

The principal areas of the pond and their conservation value are described below (see also Figure 1).

- (i) Salix scrub is extensively shading the margins of the pond and increasing leaf litter inputs. The substrate beneath the Salix is unvegetated and, when flooded, will provide a habitat for a restricted number of species of aquatic macro-invertebrates. However the scrub screens and isolates the pond from its surroundings, providing a narrow buffer zone.
- (ii) Stands of C. riparia, J. effusus and S. dulcamara occupy a large part of the centre of the pond. All are common species, J. effusus being one of the most rapid colonists of artificial wetlands and moist disturbed ground (Grime, Hodgson and Hunt, 1988). The stands of all three species are almost monospecific, outcompeting other lower growing wetland species. Because they are dry during the summer and hold large accumulations of organic litter, these areas provide a habitat for very few macro-invertebrate species.
- (iii) Mixed stand of Typha, Callitriche and Ranunculus adjacent to the landing stage. At the time of the survey this area supported the most diverse plant community. All the plant species recorded in this area are common although Grime, Hodgson and Hunt (1988) note that, because of their habitat requirements, Juncus articulatus, Ranunculus aquatilis, R. sceleratus and Sparganium erectum are all likely to be decreasing at a national level.

When flooded it is likely that this area would support the most diverse macro-invertebrate community in the pond.
- (iv) Bare sediment. The unvegetated sediment provides a habitat for very few macro-invertebrate species.

6. MANAGEMENT OF THE POND

6.1 INTRODUCTION

Management should aim to create conditions suitable for the establishment of a richer community of common plant and macro-invertebrate species. Management of the site for amphibians is not considered in detail.

The main aims of management should be to:

- i) counteract the effects of the lowering of the water table by deepening (in addition to dredging) a part of the pond. This will allow the maintenance of an area of permanent, relatively deep, water.
- ii) increase variation in vegetation structure at the margins of the pond and, by controlling the growth of competitive stand forming species, provide conditions suitable for a greater variety of water plant and macro-invertebrate species.

iii) retain areas of undisturbed sediment and marginal vegetation (especially the area near to the landing stage) from which re-colonisation of dredged areas can occur.

iv) maintain areas of coppiced scrub to provide a buffer zone around the pond.

6.2 PRACTICAL PROCEDURES REQUIRED TO ACHIEVE MANAGEMENT AIMS

6.2.1 Introduction

A considerable amount of management work is required, including the dredging out of a large quantity of accumulated sediments and the removal/coppicing of Salix cinerea scrub on the east and west sides of the pond.

It is recommended that, as with Brearely Close pond, management of the Uxbridge College pond is divided into two areas: i) an actively managed 'Cleared Area' ii) an undisturbed 'Refuge Area'.

6.2.2 Refuge area

A Refuge Area should be established around the northern and eastern margins of the pond and left undisturbed during dredging and clearing. Most of the western margin of the pond should also be included in the Refuge Area although machinery access will probably be required on some areas of this bank.

The remaining area of the pond forms the 'Cleared Area' which is discussed in the following sections.

6.2.3 Cleared area

Dredging and deepening

The pond should be dredged to the gravel base throughout the area shown on Figure 3. In the centre of the pond, gravel should be removed to deepen the pond and maintain an area of permanent open water. Up to 1m of gravel should be removed from this area (see Figure 3).

If dredging over 2 years is possible, dredge sediments from the northern 1/2 of pond first. If dredging must be carried out in a single year it is particularly important to protect the northern and eastern margins of the pond to provide a source of recolonising plants and animals.

6.2.4 Additional management recommendations

The following guidelines should be followed during renovation.

- (i) Work should be done from the western side of the pond wherever possible. In general, the eastern margin should be free from disturbance, particularly by heavy machinery.
- (ii) Within the Cleared Area all scrub should be removed and all sediments dredged from the pond.
- (iii) Flowering rush should be retained and re-established in a similar situation in the Refuge Area.
- (iv) Following clearance/dredging pond margins should be left to recolonise naturally, either from plant propagules on site or by colonising propagules.
- (v) If possible the tall sycamores growing on the west bank of the pond should be gradually removed (although the treated stumps could be retained). They should be replaced by lower growing, native species which occur locally (eg hawthorn, holly) or by taller natives which are managed as coppice (eg oak). If possible the weeping willows on the north-east bank of the pond should be thinned to allow more light to reach this margin of the pond.
- (vi) Access to the pond for machinery should be maintained.

6.3 FUTURE MANAGEMENT

A management plan for the pond should be prepared, including details of sufficient survey work to allow the success of site management to be monitored. It is recommended that access and the educational potential of the site are also discussed.

6.3.1 Management plan

The management plan should make recommendations on:

- (i) The establishment of a cycle of sediment removal to maintain areas with different depths of accumulated silt (ie areas with no, slight and considerable accumulations of silt).
- (ii) The introduction of a coppicing cycle for the Refuge Area.
- (iii) The prevention of further encroachment by Salix scrub.
- (iv) Maintaining the diversity of vegetation structure within the Cleared Area of the pond (providing habitats for invertebrates and areas suitable for colonisation by less robust marginal plants).
- (v) Preventing the development of dense monospecific stands of emergent species.

7. R E F E R E N C E S

Biggs, J. (1988). A preliminary assessment of the use of multivariate techniques (TWINSPAN & DECORANA) in the interpretation of pond survey data. Unpublished Report for the World Wide Fund for Nature.

Clapham, A. R., Tutin, T. G. and Moore, D. M. (1987). Flora of the British Isles. Cambridge University Press, Cambridge.

Grime, J. P., Hodgson, J. G. and Hunt, R. (1988). Comparative plant ecology. Unwin Hyman, London.

TABLE 1. WETLAND PLANT SPECIES PRESENT IN UXBIDGE COLLEGE POND

<i>Alisma platago-aquatica</i>	Water plantain
<i>Butomus umbellatus</i>	Flowering rush
<i>Callitriche</i> sp.	Water starwort
<i>Carex riparia</i>	Great pond sedge
<i>Epilobium hirsutum</i>	Great hairy willowherb
<i>Juncus effusus</i>	Soft rush
<i>J. articulatus</i>	Jointed rush
<i>Lemna minor</i>	Common duckweed
<i>Lycopus europaeus</i>	Gypsywort
<i>Ranunculus</i> (probably <i>aquatilis</i>)	Water crowfoot
<i>R. sceleratus</i>	Celery-leaved crowfoot
<i>Rorippa sylvestris</i>	Marsh yellowcress
<i>Salix cinerea</i>	Grey willow
<i>S. fragilis</i>	Crack willow
<i>Solanum dulcamara</i>	Bittersweet
<i>Sparganium erectum</i>	Branched bur-reed
<i>Typha latifolia</i>	Bulrush

TABLE 2. AQUATIC MACRO-INVERTEBRATE SPECIES PRESENT IN UXBIDGE COLLEGE POND

WATER SNAILS (GASTROPODA)

Lymnaea peregra
Planorbis leucostoma
Planorbis corneus

LEECHES (HIRUDINEA)

Theromyzon tessulatum

MAYFLIES (EPHEMEROPTERA)

Cloeon dipterum

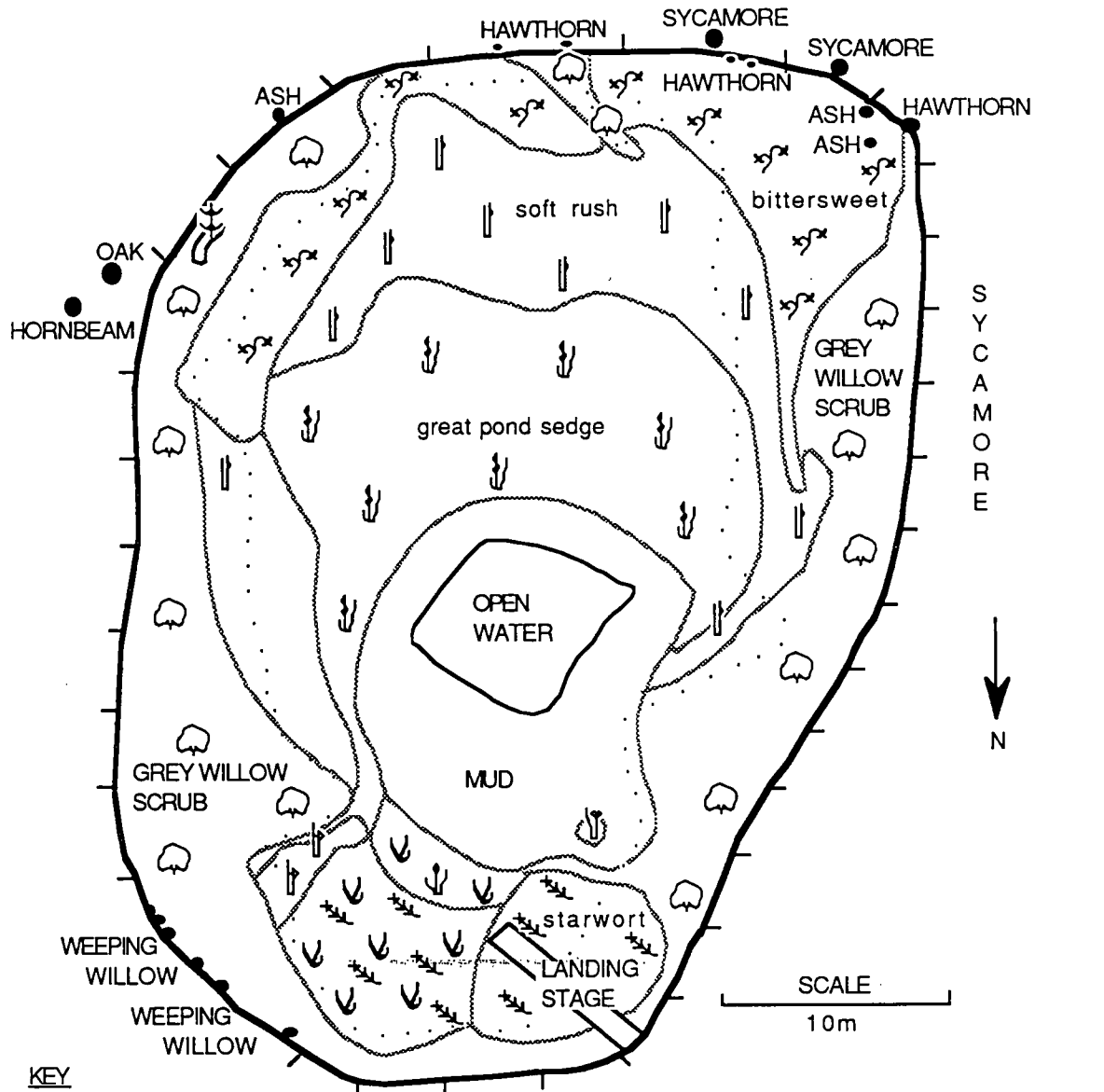
WATER BUGS (HETEROPTERA)

Corixa punctata
Notonecta glauca

WATER BEETLES (COLEOPTERA)






Coelambus confluens
Hydroporus erythrocephalus
Hydroporus palustris
Hygrobia hermani
Hygrotus inaequalis





FIGURE 1 UXBRIDGE COLLEGE POND - Vegetation
(surveyed 20/6/89)



KEY

DOMINANT VEGETATION

-  great pond sedge (*Carex riparia*)
-  soft rush (*Juncus effusus*)
-  jointed rush (*Juncus articulatus*)
-  branched bur-reed (*Sparganium erectum*)
-  reedmace (*Typha latifolia*)

-  water starwort (*Callitriche platycarpa*)
-  gipsywort (*Lycopus europaeus*)
-  flowering rush (*Butomus umbellatus*)
-  scrub

BOUNDARIES






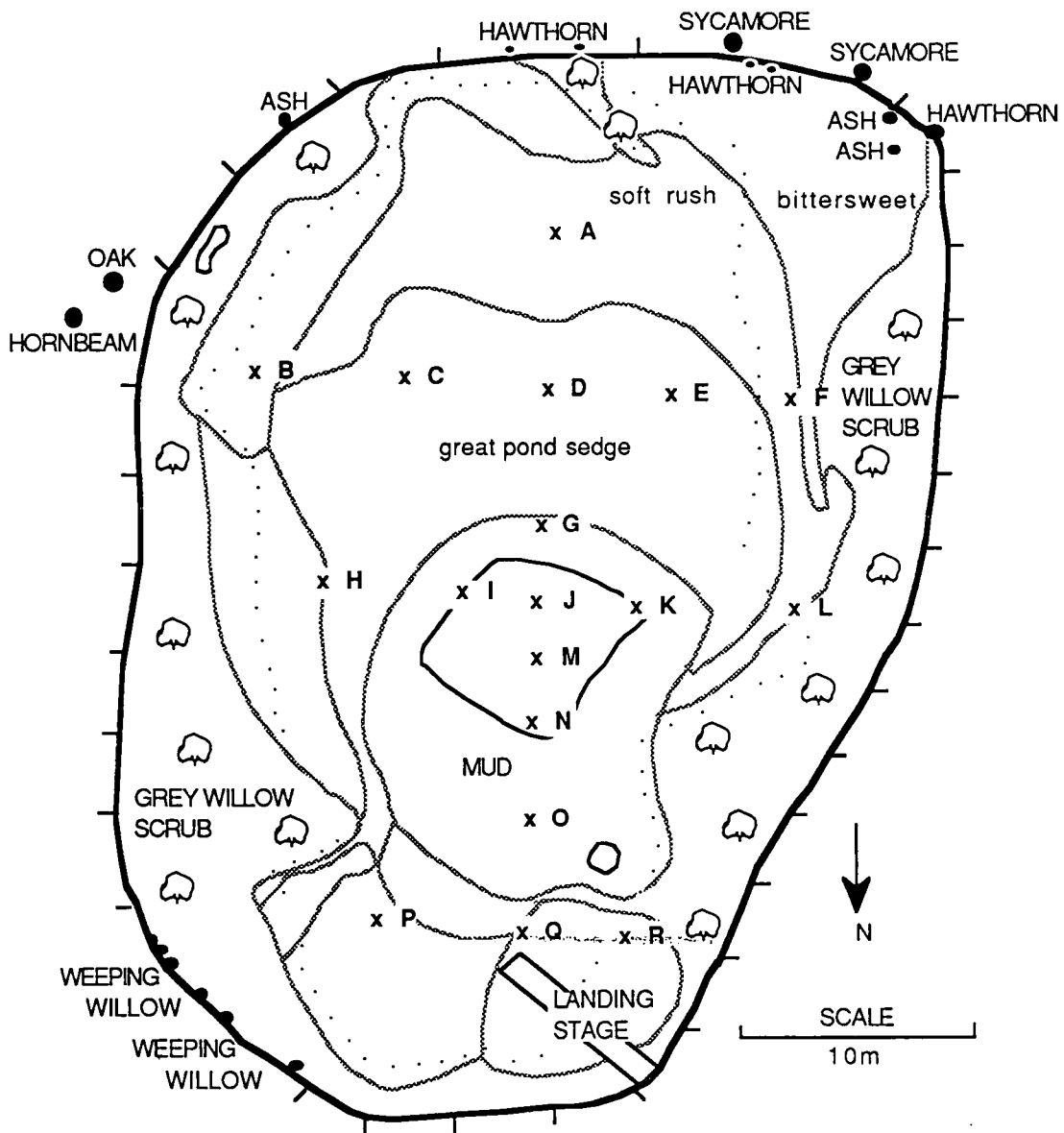
-  pond boundary
-  steep bank
-  water line
-  vegetation boundary
-  limit of overhanging vegetation

FIGURE 2 UXBRIDGE COLLEGE POND - Sediment depths
(surveyed 20/6/89)



KEY

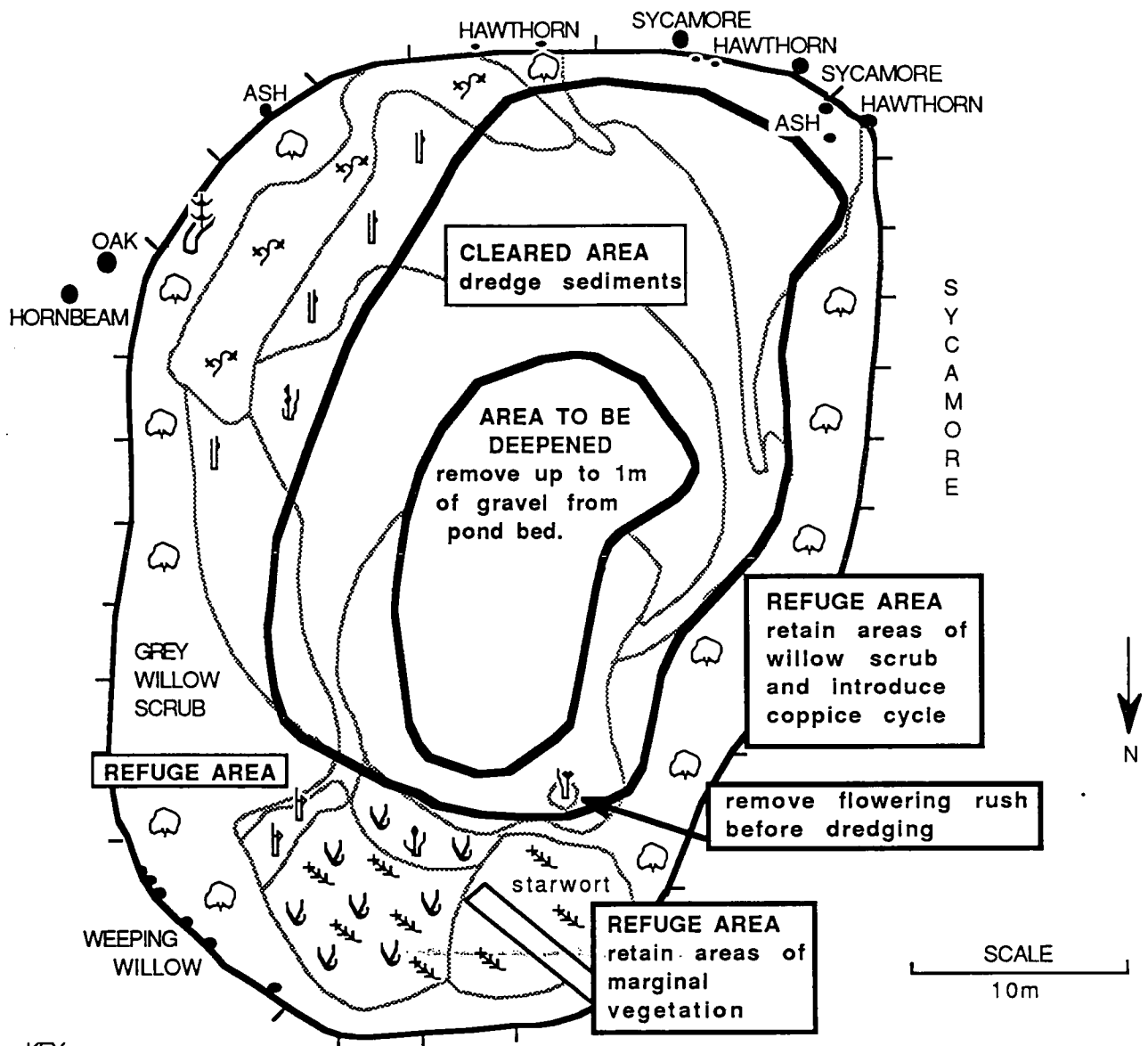
SEDIMENT DEPTHS (cm)

A 30	G 51	M 50
B 10	H 20	N 28
C 20	I 40	O 30
D 40	J 55	P 20
E 40	K 40	Q 20
F 15	L 30	R 20

BOUNDARIES






- pond boundary
- ⊥ steep bank
- water line
- - - vegetation boundary
- ... limit of overhanging vegetation





FIGURE 3 UXBRIDGE COLLEGE POND - Management







KEY

DOMINANT VEGETATION

-  great pond sedge (*Carex riparia*)
-  soft rush (*Juncus effusus*)
-  jointed rush (*Juncus articulatus*)
-  branched bur-reed (*Sparganium erectum*)
-  reedmace (*Typha latifolia*)

-  water starwort (*Callitriche platycarpa*)
-  gipsywort (*Lycopus europaeus*)
-  flowering rush (*Butomus umbellatus*)
-  scrub

BOUNDARIES

-  pond boundary
-  steep bank
-  vegetation boundary
-  management area