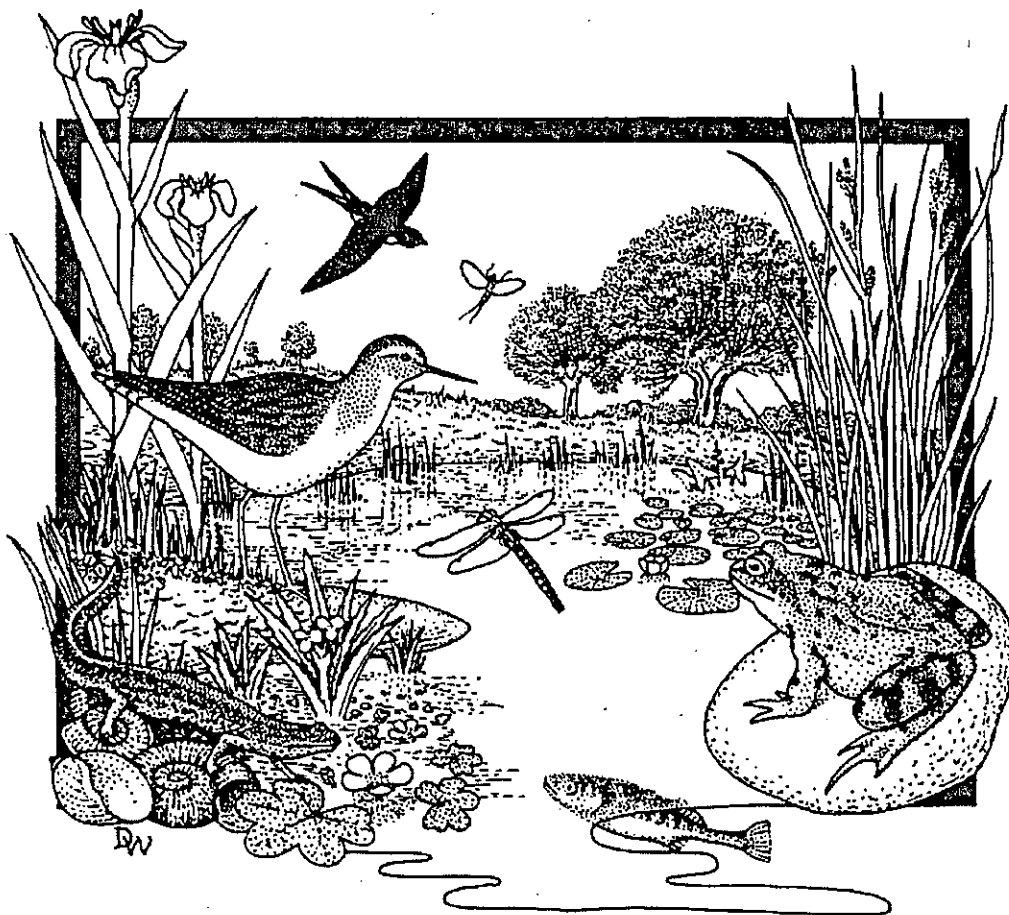


Ecological Survey of Highwood Dam



November 2000

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Report produced for:
Ponds for People

ECOLOGICAL SURVEY OF HIGHWOOD DAM

1. Aims and objectives

This report describes the results of a plant survey undertaken by Pond Action at Highwood Dam (Grid reference SE283371) in Leeds (West Yorkshire).

The work was commissioned by The Ponds Conservation Trust in order to give information about the ecological value of the site and to help provide the basis for decisions about its future management.

The current study forms part of The Ponds Conservation Trust's (PCT) 'Ponds for People' project. The first phase of this project is currently running in the NE of England as a collaborative venture between the PCT, the Environment Agency, local authorities, water companies and local community groups. The project's overall objective is to help deliver local Biodiversity Action Plan objectives with respect to ponds.

2. Methods

The site was surveyed for wetland plants by Penny Williams on 29th September 2000. Note that the survey was carried out relatively late in the year, and that additional species, particularly aquatic plants such as stoneworts, water-buttercups and pondweed species, may have been present at the site earlier in the season.

The method used for the assessment was based on a standard technique developed for the National Pond Survey.

Wetland plants¹ were surveyed by walking and wading the perimeter and open water areas less than 1 m deep noting the species present.

The pond's conservation value was assessed in terms of:

- (i) the number of species of plants recorded,
- (ii) the number of uncommon plant species found.

Plant data from the site were compared with information from other UK sites that have been surveyed using the same methodology (see Appendix 2).

¹The term 'wetland plant species' refers to species defined as wetland plants on the National Pond Survey field recording sheet list. Terrestrial plant species are not recorded.

3. Plant survey results

Highwood Dam supported a moderately rich plant assemblage with a total of 18 wetland plant species recorded during the current survey (see Appendix 1). This is a little below the average number of wetland plant species recorded in high quality, unpolluted ponds protected from significant human impacts (average number of wetland species in unpolluted ponds = 23; see Appendix 2).

All the plants recorded at Highwood Dam were common and widespread species.

Around most of the pond the abundance of wetland plants was relatively low. The northern bank abuts allotments and the edges here were either steep, disturbed or heavily overhung by trees. Despite this the margin supported occasional stands of Indian Balsam (*Impatiens glandulifera*), Yellow Iris (*Iris pseudacorus*) and Greater Spearwort (*Ranunculus lingua*), the latter two clearly planted by allotment holders. Note that Indian Balsam is a non-native alien species.

The southern and western banks of the pond had recently been re-built using loose rocks piled over a geotextile lining. These banks were, therefore, relatively new and only occasional wetland plants were present in interstices between the stones. The species recorded here included: Great Willowherb (*Epilobium hirsutum*), Soft Rush (*Juncus effusus*), Gipsywort (*Lycopus europaeus*), Water Forget-me-not (*Myosotis* sp.) and Hemlock Water-dropwort (*Oenanthe crocata*).

The open water areas of the pond supported few submerged aquatic plant species, a partial consequence, no doubt, of the turbidity of the water. However, a few plants of Water Starwort (*Callitriche* sp.) were present along the south-east and north-east banks. The alien aquatic Nuttall's Waterweed (*Elodea nuttallii*) was present in rather greater abundance (covering c.1% of the pond area), growing particularly in a thin 1-2 m wide band along the northern bank in water 0.3 m - 0.5 m deep.

4. Discussion

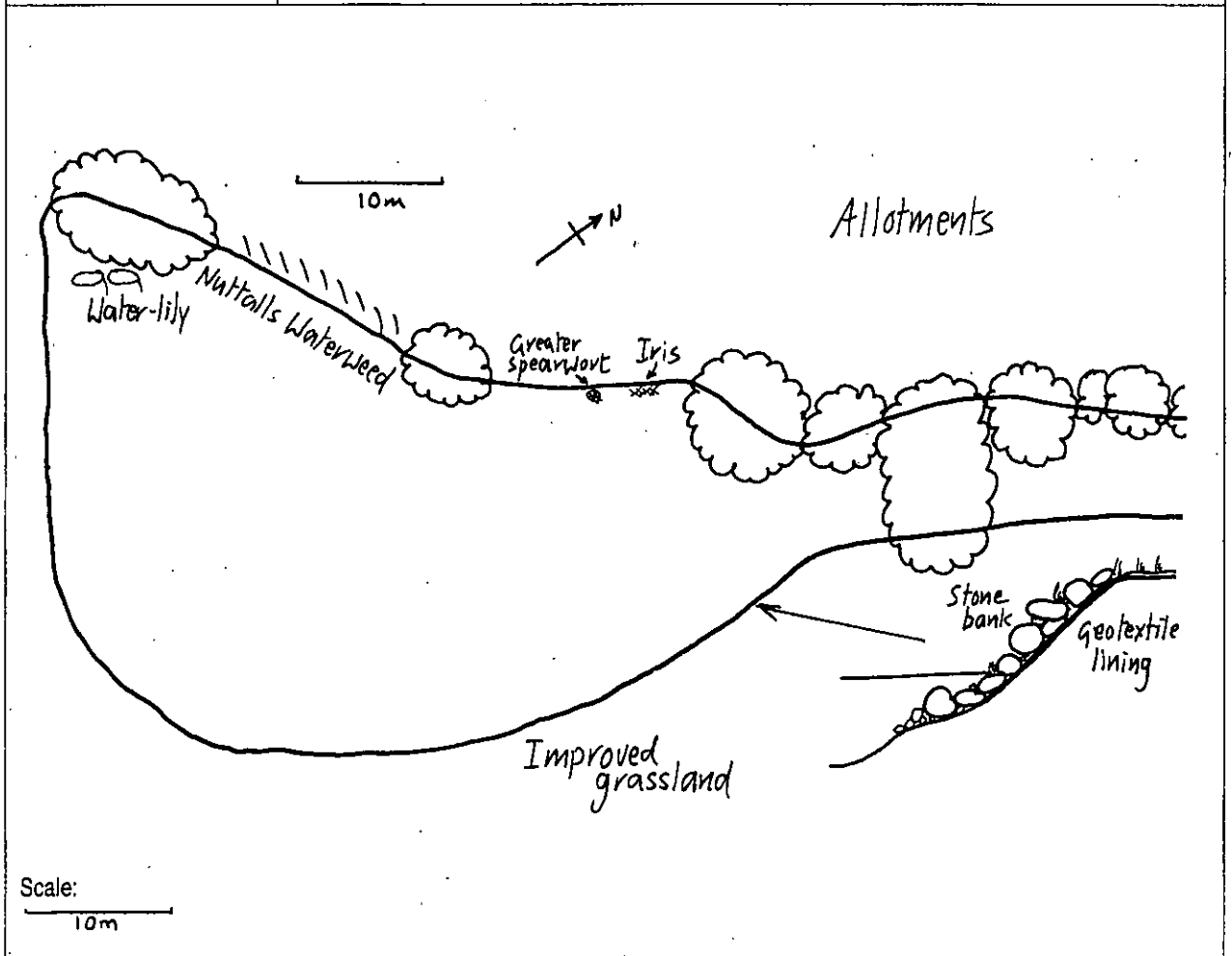
The future management of the site has not yet been discussed. However on the evidence of this brief survey, the site could be best improved by (i) encouraging wetland grasses to grow out into the water from the southern and eastern banks, and (ii) planting some margins with tall emergent species.

The effect of recent fish manipulation (fish removal and partial re-stocking) undertaken by the Environment Agency will need to be observed in order to see if this successfully reduces water turbidity.

Interest has been shown in the potential for the pond to support native White-clawed Crayfish, since the species is known to be present in the adjacent Meanwood Beck (to which the pond is linked). If introduction of crayfish to the site is considered, this will need to include an assessment of whether suitable habitats for the species exist in the pond. In particular, further investigation will be needed of the extent to which the geotextile-lined southern and eastern banks provide suitable habitat for crayfish.

Highwood Dam site details

Location	Grid reference: SE 283 371. Meanwood area of Leeds (West Yorkshire).
Date of visit	29 th September 2000.
Description	An old mill pond now converted into an amenity area adjacent to a new urban estate.
Surrounds	Urban area with allotments to the north and housing close to the other margins.
Pond area	c.0.2 ha.
Shade	Approximately 20% of the margin and 8% of the pond are directly overhung by trees.
Depth and permanence	The pond is deep and permanent. Silt and sediment depths were too great to measure without use of a boat.
Water clarity	The water was brown and turbid.
Water source	The pond has a link to the Meanwood Beck, although the original mill feeder stream has been much reduced in size.
Impacts	Mallard (c.18) plus two Mute Swans observed. Run-off from allotments. Recent disturbance to banks and surrounds. Probable pollution/nutrient enrichment from the stream inflow. High fish biomass will have impacted the pond until recently, when the Environment Agency removed most of the fish and undertook limited re-stocking.
Invertebrate habitats	The pond was rather poor in invertebrate habitats. The most useful were probably (i) the occasional tussock of grass growing into the water (ii) small planted patches of water-lilies and iris (iii) thin submerged stands of water plants.



Appendix 1. Plant species recorded

Plant species	English name	Status
Submerged plants:		
<i>Callitriche spp</i> ¹	Water starwort species	n/a
<i>Elodea nuttallii</i>	Nuttall's Waterweed	Introduced
Floating-leaved plants:		
<i>Lemna minor</i>	Common Duckweed	Common
<i>Lemna minuta</i>	Least Duckweed	Introduced
<i>Nymphaea alba</i> var.	White Water-lily variety	Planted variety
Emergent plants:		
<i>Agrostis stolonifera</i>	Creeping Bent	Common
<i>Alisma plantago-aquatica</i>	Water- plantain	Common
<i>Cardamine pratensis</i>	Cuckooflower	Common
<i>Epilobium hirsutum</i>	Great Willowherb	Common
<i>Impatiens glandulifera</i>	Indian Balsam	Introduced
<i>Iris pseudacorus</i>	Yellow Iris	Common
<i>Juncus effusus</i>	Soft Rush	Common
<i>Lycopus europaeus</i>	Gipsywort	Common
<i>Myosotis sp.</i> ¹	Water Forget-me-not species	Common
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	Common
<i>Ranunculus lingua</i>	Greater Spearwort	Native species planted at site
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	Common
<i>Sparganium erectum</i>	Branched Bur-reed	Common
Number of Submerged species	2	
Number of Floating species	3	
Number of Emergent species	13	
Total number of species	18	

¹No flowering or fruiting material were present so that plants could not be identified to species level.

Appendix 2. Comparative data for assessing pond conservation value

The following information gives a range of data about the conservation value of ponds in Britain. This information indicates the *typical* plant species richness of UK ponds based on standard surveys using National Pond Survey methods.

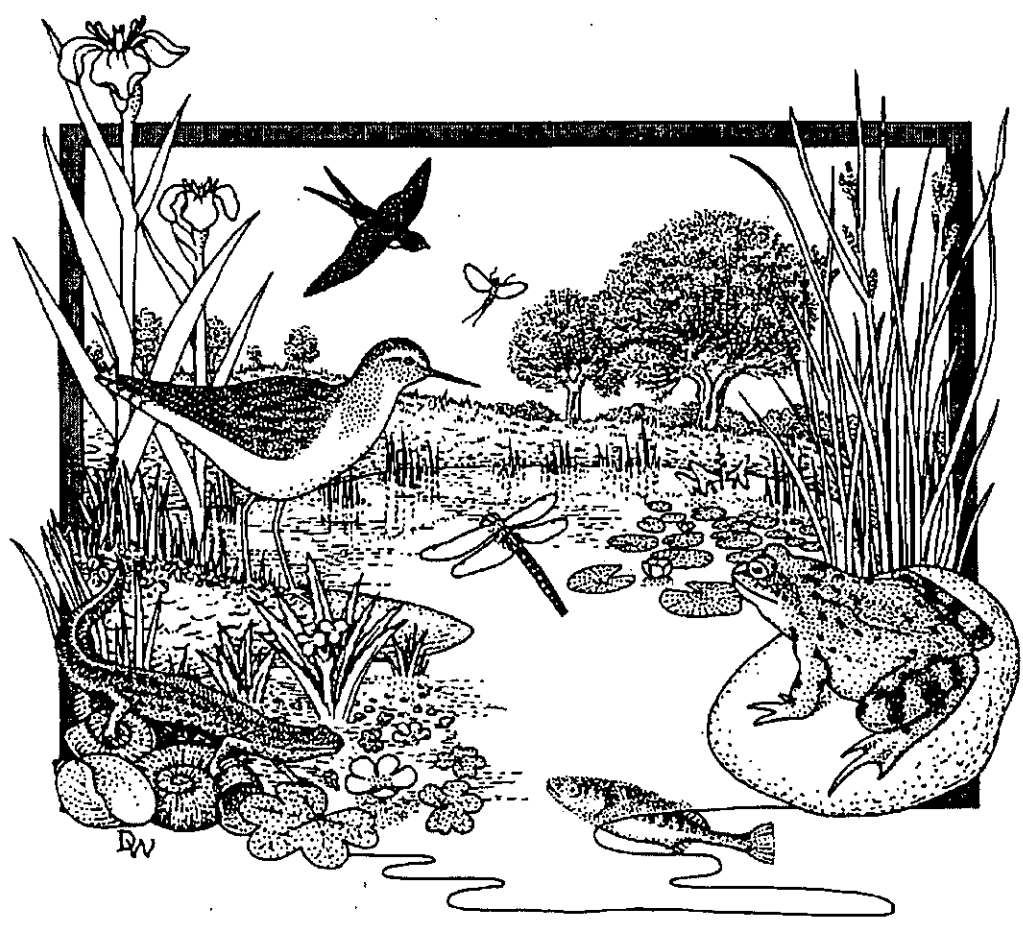
Note that National Pond Survey sites indicate the standard that ponds *should* reach in Britain when they are not exposed to damaging human impacts (e.g. water pollution, intensive land management, over-stocking with fish, artificial feeding of waterfowl). The two wider countryside surveys show the typical state of ponds in the "ordinary countryside" where ponds are often exposed to a variety of factors which reduce their conservation value.

Appendix Table 1. Number of plant species recorded from UK ponds

		<i>Number of species:</i>		
		<i>Marginal plants</i>	<i>Aquatic plants</i>	<i>Total plants</i>
National Pond Survey (high quality ponds mostly protected from pollution)	<i>Average</i>	18	5	23
	<i>Range</i>	(1-42)	(0-14)	(1-46)
Wider countryside ponds (DETR Lowland Pond Survey 1996)	<i>Average</i>	8.0	2	10
	<i>Range</i>	(0-30)	(0-10)	(0-35)
Wider countryside ponds (ROPA Survey*)	<i>Average</i>	11	3	14
	<i>Range</i>	(1-32)	(0-11)	(1-38)

*The ROPA survey was undertaken by Pond Action with funding from the Natural Environment Research Council.

Ecological Survey of Cromwell Bottom Sphagnum Bog



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ECOLOGICAL SURVEY OF CROMWELL BOTTOM SPHAGNUM BOG

1. Aims and objectives

This brief report describes the results of a plant survey undertaken by Pond Action at Cromwell Bottom *Sphagnum* Bog (Grid reference SE127222), near Brighouse (West Yorkshire).

The work was commissioned by The Ponds Conservation Trust in order to give information about the ecological value of the site and to help provide the basis for decisions about its future management.

The current study forms part of The Ponds Conservation Trust's (PCT) 'Ponds for People' project. The first phase of this project is currently running in the NE of England as a collaborative venture between the PCT, the Environment Agency, local authorities, water companies and local community groups. The project's overall objective is to help deliver local Biodiversity Action Plan objectives with respect to ponds.

2. Methods

The site was surveyed for wetland plants by Penny Williams on 29th September 2000.

The method used for the assessment was based on standard techniques developed for the National Pond Survey.

Wetland plants¹ were surveyed by walking and wading the perimeter and open water areas less than 1 m deep, noting the species present.

The site's conservation value was assessed in terms of:

- (i) the number of species of plants recorded,
- (ii) the number of uncommon plant species found.

Plant data from the site were compared with information from other UK sites that have been surveyed using the same methodology (see Appendix 1).

¹The term 'wetland plant species' refers to species defined as wetland plants on the National Pond Survey field recording sheet list. Terrestrial plant species are not recorded.

3. Plant survey results from the *Sphagnum* Bog

The *Sphagnum* Bog supported a moderately rich higher plant community with 14 wetland plant species recorded (see Table 1). Note, however that the survey was carried out relatively late in the year when the site was almost dry, and that additional species, particularly aquatic plants such as stoneworts, water-buttercups and pondweed species, may have been present at the site earlier in the season.

In addition, the site supports a rich bryophyte assemblage from which at least seven *Sphagnum* species have already been identified (Friends of Cromwell Bottom *pers. comm.*).

Amongst the higher plants all the species identified were taxa that are common and widespread at a national level. The diverse *Sphagnum* community is, however, more unusual, particularly for a small, lowland site in close proximity to major urban areas.

In terms of community composition and species abundance, the site was dominated by mounded moss tussocks, (particularly *Polytrichum commune* and *Sphagnum* species) which filled the majority of the original lagoon area. Soft rush (*Juncus effusus*) was also common across the site growing relatively sparsely between the moss tussocks. Stands of Bulrush (*Typha latifolia*), Reed Canary-grass (*Phalaris arundinacea*) and Common Reed (*Phragmites australis*) occurred more rarely but were locally dominant. In the wetter areas of the site, particularly towards the north-eastern end, acid-loving species such as Common Cottongrass (*Eriophorum angustifolium*), Marsh Willowherb (*Epilobium palustre*) and Deergrass (*Trichophorum cespitosum*), were locally common. Along the drier south-western edges, where willow was beginning to invade, more typically eutrophic wetland plant species such as Gipsywort (*Lycopus europaeus*) and Great Willowherb (*Epilobium hirsutum*) occurred.

Table 1. Higher plant species recorded from the *Sphagnum* Bog

Plant species	English name	National status
Floating-leaved plants:		
<i>Lemna minor</i>	Common Duckweed	Common
Emergent plants:		
<i>Agrostis stolonifera</i>	Creeping Bent	Common
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	Common
<i>Epilobium hirsutum</i>	Great Willowherb	Common
<i>Epilobium palustre</i>	Marsh Willowherb	Common
<i>Equisetum fluviatile</i>	Water Horsetail	Common
<i>Eriophorum angustifolium</i>	Common Cottongrass	Common
<i>Juncus effusus</i>	Soft Rush	Common
<i>Lycopus europaeus</i>	Gipsywort	Common
<i>Phalaris arundinacea</i>	Reed Canary-grass	Common
<i>Phragmites australis</i>	Common Reed	Common
<i>Solanum dulcamara</i>	Bittersweet	Common
<i>Trichophorum cespitosum</i>	Deergrass	Common
<i>Typha latifolia</i>	Bulrush	Common

4. Comments on other taxa and other areas of the site

The Cromwell Bottom site as a whole supports a very varied mosaic of wetland habitats which, in addition to the *Sphagnum* Bog, includes seasonal and semi-seasonal lagoons, permanent and seasonal ponds, wet woodland and a (non-navigated) restored canal cut.

Members of Friends of Cromwell Bottom have already undertaken macrophyte, dragonfly and amphibian surveys of the area. Their data suggests that the site as a whole supports a rich wetland macrophyte flora including uncommon plant species such as Needle Spike-rush (*Eleocharis acicularis*). The site also supports a diverse dragonfly community and good populations of amphibians including common frog, common toad, smooth newt and palmate newt. The frog and toad populations, in particular, are exceptional with in excess of 2000 frog clumps and almost 700 toad strings recorded in spring 2000.

5. Discussion and recommendations

5.1 *The Sphagnum bog*

Over recent years the *Sphagnum* Bog area is reported to have become drier, and this has accompanied successional growth of bulrush, soft rush, common reed, birch scrub and willow carr. Friends of Cromwell Bottom propose clearance of these invasive plants in order to ensure that the area remains open and does not succeed to woodland.

On the basis of the current survey results it seems likely that clearance of woody vegetation is likely to be beneficial to the long term development of the site, and particularly the *Sphagnum* communities. Clearance of tall emergent plants would also be beneficial, but this is likely to be more difficult and time consuming. We can give further advice on possible management techniques if required.

In the long term, it is possible that the bog may become self-sustaining, particularly if *Sphagnum* increases on the site. It is possible, for example, that the current drying out may be part of the natural process accompanying the early development of a raised bog structure. Certainly the site has already developed the perimeter channel structure that is often characteristic of such sites. If this is the case, the increasing acidity of the site may make it progressively more unsuitable for the emergent species that are currently invading the area. In order to establish the status of *Sphagnum* and other acid-loving species on the site, it is recommended that a number of permanent plant quadrats are established, and monitored annually to look at the vegetation trends. Again, recommendations about materials and techniques for monitoring can be given if required.

5.2 Other issues

Other management issues on the site relate to:

(i) Lagoon 2

Lagoon 2 appears to be becoming progressively more temporary and consideration is being given to the possibility of using canal water to top-up water levels in the lagoon in summer. The effect of such actions on the lagoon or the near-by *Sphagnum* bog has not yet been evaluated, but could potentially be damaging

(ii) Lagoon 1

Bulrush and Common Reed are increasingly encroaching into Lagoon 1 threatening, in particular, the existing shallow water community which includes Needle Spike-rush and Smooth Stonewort (*Nitella flexilis*).

(iii) New Zealand Pigmyweed (*Crassula helmsii*)

Two small stands of *Crassula* were seen on the site and more may exist. These areas need to be treated/removed *as a matter of urgency*, and a regular check made to ensure that no large colonies can begin to establish. Small areas of *Crassula* (less than 30 cm²) can sometimes be dug out successfully, although it is important that the area is re-checked regularly to ensure that no re-growth occurs. Larger stands need to be treated with considerable care. Recommendations for treatment are given in "The Pond Book", a copy of which will be provided for each community group as part of the Ponds for People project.

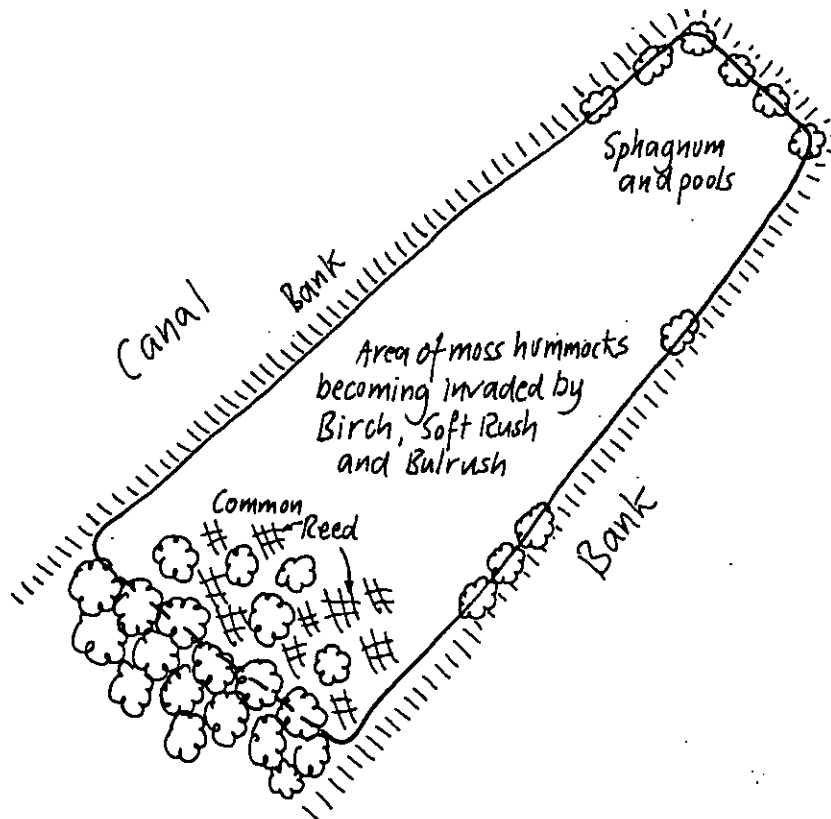
5.3 Conclusions

Cromwell Bottom is a large (39.4 ha), varied site with an active, interested and knowledgeable local group.

The site appears to have much current interest, considerable future potential and many pressing management issues. It is, therefore, recommended that the Ponds for People project considers the possibility of funding further survey work at the site, preferably including surveys of aquatic macroinvertebrates, in order to help support future management decisions.

Cromwell Bottom *Sphagnum* Bog site details

Location	Grid reference: SE 127 222. One mile west of Brighouse (West Yorkshire). The <i>Sphagnum</i> Bog occupies a triangular area of land located between the River Calder and the Calder and Hebble Navigation.
Date of visit	29 th September 2000.
Description	Area of <i>Sphagnum</i> bog and pools developed in an old lagoon that was part-filled with fly ash. Located at the north-eastern tip of the Cromwell Bottom site.
Surrounds	Secondary woodland to the south-west, grassy banks around other margins with the river and canal beyond.
Pond area	c. 0.45 ha
Shade	Approximately 50% of the margin and 8% of the bog area are directly overhung by trees.
Depth and permanence	The bog is flooded in winter and a number of small pools generally remain after water recedes from most of the bog in summer.
Water source	The bog is largely fed by surface water from the surrounds, although it is possible that a groundwater table exists in the fly ash deposit.
Impacts	None apparent, although the fly ash will inevitably be contaminated.
Invertebrate habitats	The pond is well vegetated and is likely to support an interesting, and probably unusual, aquatic and wetland invertebrate fauna



Scale:
0 10m

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