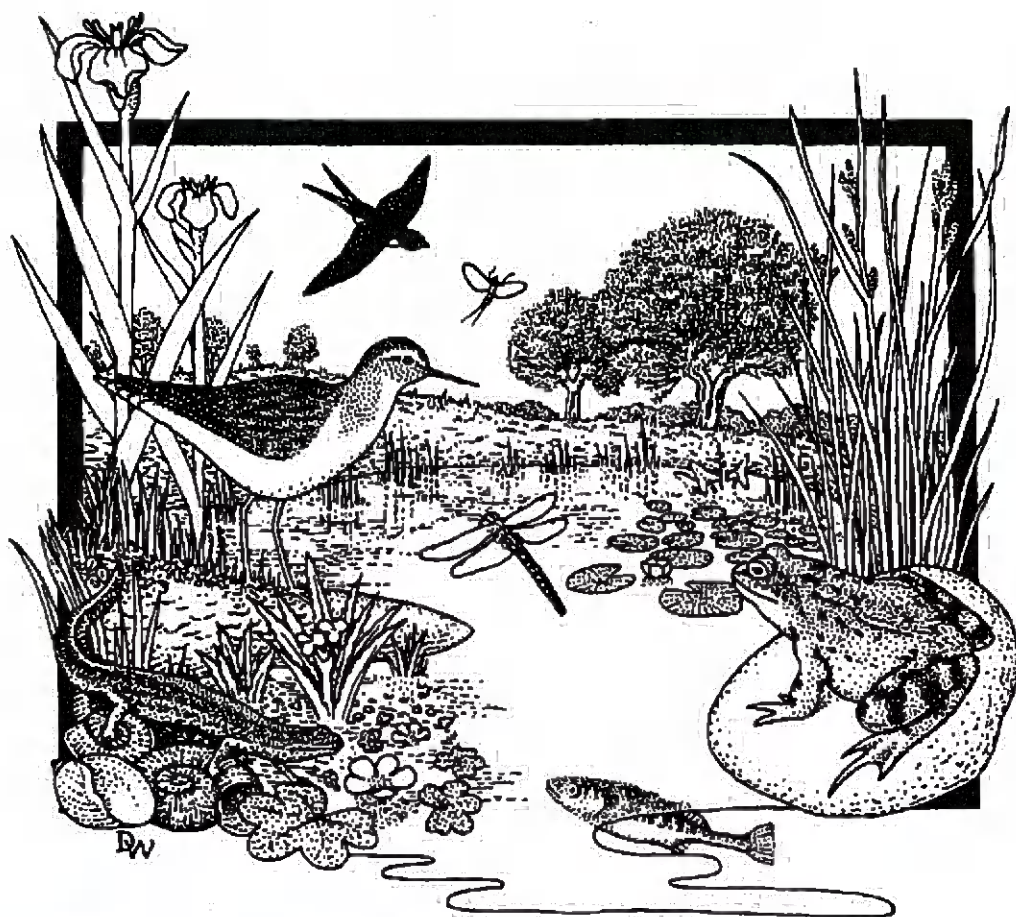


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Ecological Survey of Charlton's Pond



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ECOLOGICAL SURVEY OF CHARLTON'S POND

1. Aims and objectives

This report describes the results of a plant survey undertaken by Pond Action at Charlton's Pond (Grid reference NZ467232) near Billingham.

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 28th 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 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 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

Charlton's Pond supported a moderately rich plant assemblage with a total of 15 wetland plant species recorded during the current survey (see Appendix 1). This total is lower than is typical of high quality, unpolluted ponds protected from human impacts (average number of wetland plant species in unpolluted ponds = 23). However, it is still richer than most ponds in the countryside which, because of the widespread effects of pollution and other damaging impacts, support, on average, only 10 wetland plant species (see data in Appendix 2).

Although, overall, the pond was only moderately rich in plant species, it supported an unusually diverse submerged plant community. This included the alien Nuttall's Waterweed (*Elodea nuttallii*) and five native species: Spiked Water-milfoil (*Myriophyllum spicatum*), Fennel Pondweed (*Potamogeton pectinatus*), Curled Pondweed (*Potamogeton crispus*), Horned Pondweed (*Zannichellia palustris*) and, more rarely, Small Pondweed (*Potamogeton berchtoldii*). Of these species, Horned Pondweed was particularly common along the northern bank growing in a band up to 3 m wide on shallow submerged muddy gravels in water depths of up to 0.5 m. The other aquatic plants were generally more common along the southern and eastern banks, often growing together with submerged moss (*Drepanocladus* sp.) and green algae (*Cladophora* and *Enteromorpha* spp.). The composition of the flora in the deeper and more open-water areas of the lake could not be ascertained, although this information could potentially be gathered by further work grapnelling from a boat.

In contrast to the rich submerged plant community, the pond's marginal plant community was relatively impoverished, with only five emergent species recorded. This is very low for such a large pond with apparently good water quality (see Appendix 2 for comparative data from other ponds). The most abundant emergent was Sweet-flag (*Acorus calamus*), a non native plant species that occurred in small plant stands and was probably planted at the site. The common grass Creeping Bent (*Agrostis stolonifera*) was also locally abundant at the pond edge.

None of the species recorded from Charlton's Pond were rare or Nationally Scarce plants. However three of the species noted can be considered to be rather "local" at a national level, in that they have been recorded in less than about a quarter of all 10 x 10 km squares in Britain. These species are listed in Table 1. All are submerged aquatic plants, reflecting the fact that there is a paucity of unpolluted water capable of supporting rich submerged plant communities in Britain.

Table 1. Uncommon plant species recorded

| Plant species | English name | Status |
|--------------------------------|----------------------|--------|
| <i>Myriophyllum spicatum</i> | Spiked Water-milfoil | Local |
| <i>Potamogeton berchtoldii</i> | Small Pondweed | Local |
| <i>Zannichellia palustris</i> | Horned Pondweed | Local |

4. Discussion

Charlton's Pond has a diverse submerged plant community which suggests that its water quality is relatively good.

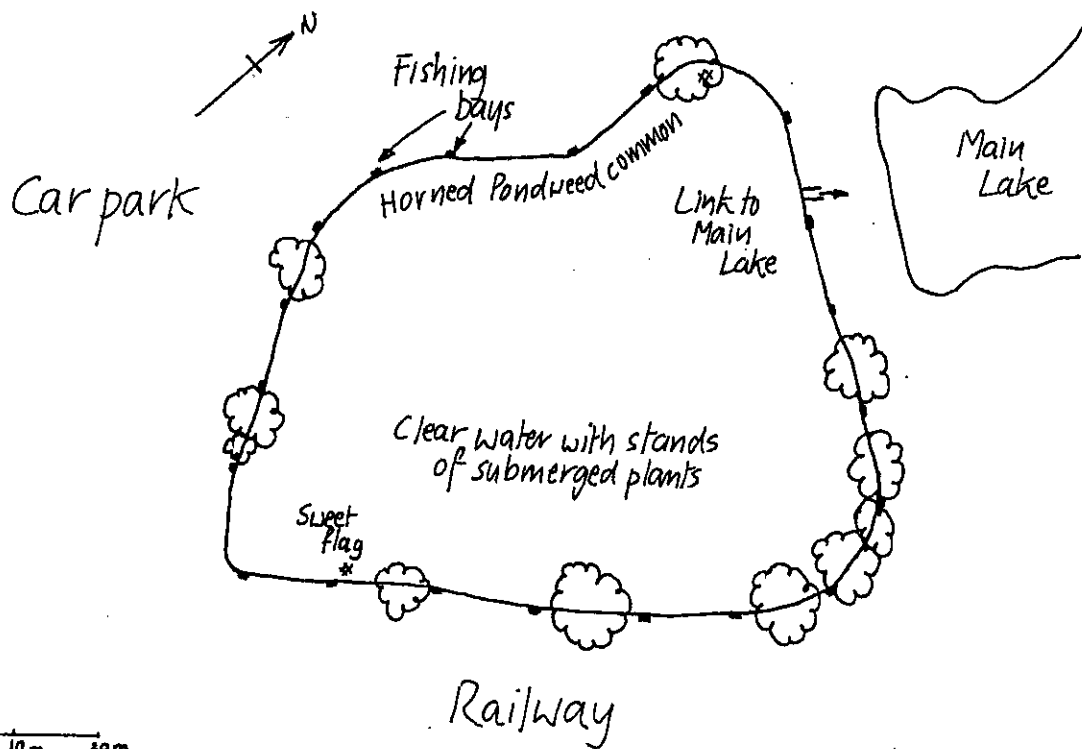
The reason for the pond's poor emergent plant community is not clear. There are extensive marginal areas around the pond with relatively shallow slopes, and these would usually be colonised by emergent plant stands. Their absence may, therefore, be due to disturbance by fishermen or to clearance.

Given the site's good water quality it is likely that the pond already has a diverse aquatic macroinvertebrate community. However, it is likely that this could be further enhanced by the introduction of a small number of emergent plant species to the pond edge. Suitable species, such as Common Spike Rush (*Eleocharis palustris*) and Branched Bur-reed (*Sparganium erectum*), are present in the larger lake immediately to the east, and plants could easily be transferred from here.

Additional general background information about combining fisheries and wildlife interest in ponds is given in Appendix 3.

Charlton's Pond site details

| | |
|-----------------------|--|
| Location | Grid reference: NZ467 232. Outskirts of Billingham. |
| Date of visit | 28 th September 2000. |
| Description | The smaller of two waterbodies located in a semi-natural amenity park area on the edge of Billingham. |
| Surrounds | Car-park, railway line, grassland, woodland and scrub, main lake. |
| Pond area | c.0.6 ha. |
| Shade | Approximately 8% of the margin and 3% of the pond are directly overhung by trees. |
| Depth and permanence | The pond is deep (>1.5 m) and permanent. More accurate measurement of water and silt depth would require boat-work. |
| Water clarity | The water was clear with a Secchi depth in excess of 1.5 m. |
| Water source | The pond appeared to be groundwater fed, but it is also linked to the main lake immediately to the east. |
| Amenity | The pond has numerous fishing bays. A relatively small number of ducks and other waterfowl (Mute Swan, Mallard, Coot) were present. These are fed by local people. |
| Impacts | The pond margins are locally impacted by reinforcement of the pond edge and disturbance by fishermen. |
| Invertebrate habitats | Although the pond has few stands of emergent plants it supports a range of other excellent invertebrate habitats including: (i) thin fringes of grasses (particularly Creeping Bent, <i>Agrostis stolonifera</i>) growing out from the margins (ii) submerged root bundles growing out from large willows, particularly along the southern and eastern edges (iii) small stands of floating plants including Amphibious Bistort (<i>Persicaria amphibia</i>) and White Water-lily (<i>Nymphaea alba</i>). |



Appendix 1. Plant species recorded

| Plant species | English name | Status |
|------------------------------------|--------------------------|------------|
| Submerged plants: | | |
| <i>Elodea nuttallii</i> | Nuttall's Waterweed | Introduced |
| <i>Myriophyllum spicatum</i> | Spiked Water-milfoil | Local |
| <i>Potamogeton berchtoldii</i> | Small Pondweed | Local |
| <i>Potamogeton crispus</i> | Curled Pondweed | Common |
| <i>Potamogeton pectinatus</i> | Fennel Pondweed | Common |
| <i>Zannichellia palustris</i> | Horned Pondweed | Local |
| 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 | Introduced |
| <i>Persicaria amphibia</i> | Amphibious Bistort | Common |
| Emergent plants: | | |
| <i>Acorus calamus</i> | Sweet-flag | Introduced |
| <i>Agrostis stolonifera</i> | Creeping Bent | Common |
| <i>Carex otrubae</i> | False Fox-sedge | Common |
| <i>Epilobium hirsutum</i> | Great Willowherb | Common |
| <i>Solanum dulcamara</i> | Bittersweet | Common |
| Number of Submerged species | 6 | |
| Number of Floating species | 4 | |
| Number of Emergent species | 5 | |
| Total number of species | 15 | |

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, overstocking 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.

Appendix 3. Features of fishing ponds

This table summarises features, which are valuable in stillwater fisheries, and describes additional features that can increase a fishing pond's value for other wildlife.

Factors important for freshwater fisheries

- Shelter provided by bankside trees.
- Addition of large dead branches in shallow water to provide shelter for carp and creation of deadwood reefs to protect fish from predation.
- Adequately oxygenated water (though dissolved oxygen concentrations are much more critical for salmonids than for the coarse fish of still waters).
- Creation of spits, bays and islands to make natural swims for each rod.
- Areas of deep water (1 - 3 m) which may be used by trout in summer and carp in winter to find comfortable water temperatures.
- Some deep water near to the bank to make landing fish easier.
- Creating shallow edges to create areas where dense plant stands can provide good habitat for coarse fish spawning and feeding.
- Creating shallow marsh areas, which are inaccessible to adult fish, to provide good fry habitats.
- Making/clearing swims to improve angling enjoyment and create open water for casting.
- Encouraging marginal plants to provide cover and spawning areas for fish such as carp.
- Encouraging growth of submerged aquatic plants and lilies.
- Netting out excess fish (e.g. excess carp, bream, roach, rudd and perch to reduce competition and produce bigger specimen fish).
- Desilting to maintain open water for fishing.
- No go areas during the bird-breeding season and during the winter to provide sanctuaries for fish spawning and respite from angling pressure for species such as carp or pike.

Enhancing fisheries for wildlife

What to avoid:

- *Avoid runoff from roads, carparking or other urban areas entering the pond.*
- *Avoid introducing non-natural substances, which will add to pollutant levels as they degrade e.g. creation of 'reefs' from old tyres.*
- *Stocking of fish beyond natural densities.* Most fishing waters will be stocked to provide large numbers of fish for angling. Fish are a natural part of most permanent freshwater ponds and pools and about 30-50% of freshwater plants and animals co-exist with fish. The remainder prefer or require freedom from fish predation. Waters with a moderate fish density (up to about 100 kg per hectare) with a mixed population of fish, can be good wildlife habitats. However, unnaturally high densities of fish, greater than 100 kg/ha will have a strongly detrimental impact on the rest of the aquatic ecosystem (loss of aquatic plants, increased turbidity) and will reduce diversity of 'fish compatible' wildlife.
- *Fertilising or neutralising (raising the pH) of waters.* In waters with naturally low nutrient status, or naturally acid (or acidified) waters, fishery managers sometimes fertilise water to increase fish productivity. This is likely to damage naturally acid and low nutrient status waters. Fertilising ponds is perhaps the single most undesirable activity that fishery managers could undertake.

Appendix 3. Features of fishing ponds (continued)

- *Avoid adding any non-native plants.* Plant only native species of local provenance. Avoid garden centre plants which are often contaminated with alien plant seeds. This is vital to avoid non-native plants from being released into the wild and decreasing the conservation value of some of our most beautiful and valuable waterbodies and wetlands.

What to encourage

- *Areas of very shallow water with very dense plant cover* where even young fish find it difficult to penetrate. These will provide sanctuaries for invertebrate animals. In the long term the fish will also benefit from the production of invertebrates food as they move out into other areas more accessible to fish.
- *Isolated shallow pools, some seasonal,* around the edge of ponds which are completely separated from the main waterbody. These provide completely fish-free areas where a wider range of dragonflies, water beetles and other wildlife can thrive.
- *Ponds with a mosaic of habitats that will encourage a range of species.* This could include: complexes of emergent, trees growing in and near the water (providing leaf litter, rotting dead wood for dragonflies, tree roots growing into the water for invertebrate habitat).