

PONDS IN OXFORDSHIRE

1. INTRODUCTION

Ponds are small bodies of standing water, which may be of man-made or natural origin. They are defined here as 'water bodies between 1m² and 2 ha in area, which hold water for 4 months of the year or more' (Pond Conservation Group, 1993). This definition includes both permanent and seasonal ponds.

Ponds are essentially a natural waterbody type which has been extensively recreated by man. Across Britain, natural ponds still occur in many semi-natural areas, particularly those with a seasonally high water table (e.g. meander cut-offs, bog-pools, tree-fall pools, pingos and dune slacks). In more intensively managed areas, however, processes such as drainage and river channelisation have considerably reduced opportunities for natural pond creation. In these areas, man-made ponds, dug either deliberately (e.g. field ponds) or created as a by-product of human activities (e.g. quarry ponds), can provide a valuable semi-natural substitute for natural pond habitats.

<p>UK Biodiversity Group - Priority Species</p> <p>Otter</p> <p>Water vole</p> <p>Pipistrelle</p> <p>Reed bunting</p> <p>Great crested newt</p> <p>Glutinous snail</p> <p>White-clawed crayfish</p> <p>Tassel stonewort</p> <p>True fox sedge</p> <p>UK Biodiversity Group - Species of Conservation Concern</p> <p>Water shrew</p> <p>Snipe</p> <p>Teal</p> <p>Shoveler</p> <p>Kingfisher</p> <p>Grass snake</p> <p>Frogbit</p> <p>Grass-poly</p> <p>Local Character Species</p> <p>Water beetle, <i>Haliphus furcatus</i></p> <p>Associated Habitats</p> <p>Farmland</p> <p>Rivers and ditches</p> <p>Grazing marsh and neutral grasslands</p>
--

2. CURRENT STATUS

2.1 Current status in the UK

2.1.1 Habitat extent

Data from the early 1990's suggest that there are approximately 340,000 ponds in the British countryside (Barr *et al.*, 1994). This figure is likely to be a considerable under estimate, however, since it omits seasonal ponds, urban ponds and systematic surveys of ponds in woodlands. Inclusion of these ponds would be likely to increase the 1990 total by 30-50%.

Nationally, the number of Britain's ponds has been steadily declining this century. Swan and Oldham (1989) estimated that pond loss since the Second World War was of the order of 38%. Analysis of Countryside Survey 1990 results for the Department of the Environment suggested similar rates of loss (ca. 1% per annum) in the period 1984 to 1990 (Barr *et al.*, 1994).



Yellow flag iris *Iris pseudacorus*

2.1.2 *Physico-chemical status*

Nationally, ponds vary widely in their physico chemical characteristics. Chemically ponds can range from highly acid peat pools to highly alkaline ponds fed by calcareous groundwater (pH c.3.5 - 9.0) (Pond Action unpublished data from the National Pond Survey). Recent surveys suggest that, in lowland Britain at least, about 60% of ponds are permanent. However a surprising number of seasonal ponds also occur: Department of the Environment, Transport and the Regions (DETR) figures, for example, indicated that around 40% of Britain's lowland ponds dried up in 1996 (Williams *et al.*, 1998).

2.1.3 *Biological status*

Ponds are rich wildlife habitats, and collectively at least two-thirds of Britain's freshwater plants and animal species can be found in them. National comparisons of numbers of invertebrate species recorded from ponds and rivers show that ponds have 10-15% more species and roughly twice as many nationally scarce species (Williams *et al.*, 1998). Ponds are particularly important habitats for aquatic invertebrates, wetland plants and amphibians. The value of ponds for aquatic mammals, birds and fish is less well documented although many species (e.g. water vole, otter, water shrew, harvest mouse, many cyprinid fish, waders, many dabbling ducks, grebes) are known to make use of ponds, especially where they form part of a mosaic with other wetland habitats.



Water beetle

Nationally, a high proportion of aquatic habitat dependent BAP species are associated with both permanent and temporary ponds including: starfruit, three-lobed water-crowfoot, tadpole shrimp, fairy shrimp, medicinal leech, spangled water beetle, great crested newt and natterjack toad.

There are no national surveys describing current trends in the biological quality of ponds. However, it is likely that in most areas the quality of ponds has declined considerably during the 20th century,

concomitant with increases in both urban and rural intensification. Local surveys suggest that this process continues (P. Nicolet, 1998).

2.2 **Current status in Oxfordshire**

2.2.1 *Habitat extent*

There are no detailed estimates of the number of ponds in Oxfordshire. However, data derived from the DETR's Lowland Pond Survey 1996 give an average pond density for the English lowland countryside of 1.7/km². Extrapolating this figure to Oxfordshire gives a figure of ca.4,000 ponds in the county.

If pond loss in Oxfordshire follows national trends then there may have been a net loss of ca. 6,000 ponds since the turn of the century.

No estimates have been made of the number of seasonal ponds in the county. However using national data which indicate that approximately 40% of lowland countryside ponds may dry-up in summer, it is possible that in order of 1,600 of the 4,000 ponds in Oxfordshire may be seasonal.

Pond creation is an essential process helping to reduce pond loss in the county. A number of habitat creation schemes in Oxfordshire have focused particularly on pond creation including the Pinkhill Meadow project initiated in 1990/91, which created a complex of over 40 ponds beside the River Thames at Farmoor, and which has recently been complemented by another wetland creation scheme a little way upstream of it (Shrike Meadow). Similarly, many new ponds and pools will be created on wet grassland as part of the RSPB Otmoor scheme and planned works for Otmoor SSSI.

2.2.2 *Physico-chemical status*

Data from the Oxfordshire Pond Survey suggest that most of the county's ponds are circum neutral to alkaline (pH range 6.9-8.9, mode 8.1) (Pond Action, 1994). Most ponds in the survey were eutrophic. However, ponds associated with calcareous fens, such as Ruskin Pond in Cothill SSSI, typically supported mesotrophic plant communities (Pond Action, 1994).

2.2.3 *Biological status*

Data from the Oxfordshire Pond Survey indicate that some Oxfordshire ponds are of exceptional value for wildlife. Most high quality ponds are located in areas of semi-natural land use (SSSIs, LNRs etc.), however sites in the wider countryside may also support rich

communities and uncommon species, particularly where the ponds are fed by groundwater or are buffered against polluted run-off.

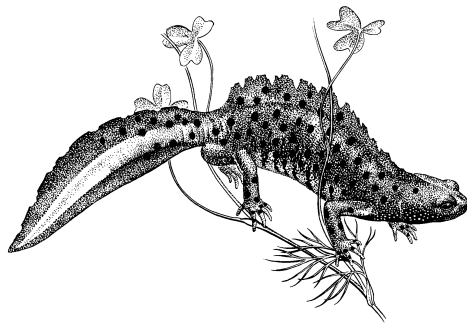
2.3 Priority species

Ponds are the main habitat for three of Oxfordshire's Priority BAP species:

- Great crested newt
- Tassel stonewort
- Glutinous snail

Note, however, that for glutinous snail only one site is known and at present (spring 1999) the species cannot

subsequent surveys, priority BAP species recorded include tassel stonewort and the Red Data Book 1 water beetle *Haliplus furcatus*.



Great crested newt (male) *Triturus cristatus*

be found at this site. Only two sites (a temporary pool and the margins of a semi-permanent pond) are currently known for tassel stonewort (2000). However, further sites may be located as the plant is easily overlooked.

In addition six other Priority species are found in association with ponds in Oxfordshire though they are not dependent on pond habitats. These are:

- White-clawed crayfish
- Water vole
- Otter
- Reed bunting
- Pipistrelle
- True fox sedge

Other BAP species of conservation concern associated with ponds include water rail, little grebe and grass-poly.

There are additional records of Red Data Book species including the water beetles *Enochrus isotae* (RDB3) and *Gyrinus suffriani* (RDB2). A survey of seasonal ponds in Oxfordshire (Collinson *et al.*, 1995) indicated that temporary water bodies can also support some exceptionally uncommon species. In

5. REFERENCES

- Barr, C.J., Howard, D.C. and Benefield, C.B. (1994). *Countryside Survey 1990. Inland water bodies*. Countryside 1990 Series Volume 6. Department of the Environment, London.
- Collinson, N.H., Biggs, J., Corfield, A., Hodson, M.J., Walker, D., Whitfield, M. and Williams, P.J. (1995). Temporary and permanent ponds: an assessment of the effects of drying out on the conservation value of aquatic macroinvertebrate communities. *Biological Conservation*, **74**, 125-133.
- English Nature (1997a). *Thames and Avon Vales Natural Area Profile*. English Nature, Thattham.
- English Nature (1997b). *Chilterns Natural Area Profile*. English Nature, Thattham.
- English Nature (1998). *Cotswolds Natural Area profile*. English Nature, Thattham.
- Grime, J.P. and Callaghan, T.V.G. (1990). *Direct and indirect effects of climate change of plant species, ecosystems and processes of conservation and amenity interest*. Contract report T07020b1. DOE.
- Nicolet, P. (1998). *25 years of change in the plant community and the conservation value of some Cheshire ponds*. MSc Thesis. Imperial College, London.
- Oxfordshire Nature Conservation Forum (1998). *Action for wildlife: Oxfordshire's Biodiversity Action Plan*. ONCF, Oxford.
- Pond Action (1994). *The Oxfordshire Pond Survey*. Oxford.
- Pond Conservation Group (1993). *A future for Britain's ponds: An agenda for action*. Pond Conservation Group, Oxford.
- Swan, M.J.S. and Oldham, R.S. (1989). *Amphibian communities. Final Report*. Nature Conservancy Council, Peterborough.
- UK Biodiversity Group (1998). *Tranche 2 Action Plans. Volume II - terrestrial and freshwater habitats*. English Nature, Peterborough.
- Williams, P., Biggs, J., Dodds, L., Whitfield, M., Corfield, A. and Fox, G. (1996). *Biological techniques of still water quality assessment: Phase 1 Scoping Study*. R&D Technical Report E7. Environment Agency, Bristol.
- Williams, P.J., Biggs, J., Barr, C.J., Cummins, C.P., Gillespie, M.K., Rich, T.C.G., Baker, A., Baker, J., Beesley, J., Corfield, A., Dobson, D., Culling, A.S., Fox, G., Howard, D.C., Luursema, K., Rich, M., Samson, D., Scott, W.A., White, R. and Whitfield, M. (1998). *Lowland Pond Survey 1996*. Department of the Environment, Transport and the Regions, London.
- Williams P., Biggs J., Whitfield M., Fox, G. (in prep). Pond management for wildlife. Proceedings of the 1998 Pond Conference.