



# MANAGING TREES AROUND PONDS

## Why are trees important?

Pond management guides have traditionally recommended that ponds should not be shaded by trees, often creating rules such as: 'to stay healthy, a pond must get at least 4 hours full sunlight a day', 'trees should be felled on the south side of ponds to let in light' and 'fallen tree branches should be removed from the water'.

Although heavily shaded ponds may sometimes look uninviting and trees do cast leaves and branches into ponds, the effect is not necessarily detrimental to their conservation value. Surveys have shown that shaded habitats can support specialised and uncommon species just like open sites.

Perhaps this should not be surprising: the association between trees and ponds is long-established on a geological timescale, and in natural landscapes ponds would often be expected to have trees growing around them. So it would also be expected that the conditions provided by decaying wood and leaves or wooded surrounds should be exploited by aquatic species, and indeed this is the case.

## Plants and trees

Few wetland plants tolerate *very* dense shade because they need light to photosynthesise. However, a surprising number grow in partial shade. These species include emergents like: Yellow Iris, Greater Tussock Sedge, the rare True Fox Sedge; and floating-leaved species such as the aquatic liverwort *Riccia fluitans* and the common duckweeds. Where water quality is good, more uncommon aquatic plants such as Water-violet and the rare Fen Pondweed can be found in shaded pools. The best shade plant communities are generally in areas with long-established wet woodlands like the Cambridgeshire fens, or areas where woods, marshes and ponds have long been closely associated, like the wooded areas of Kent and Devon.



Natural Ponds surrounded by wildwood (Bialowieza Forest, Poland)

## Pond animals and trees

Underwater branches and tree trunks, fragments of wood and leaf litter all provide food and shelter for invertebrates. Tree roots growing in the water itself are also a valuable, and overlooked invertebrate habitat.

Pond animals exploit these habitats in a great variety of ways including:

- Rotting trunks that fall into the water provide a favoured egg-laying site for dragonflies such as the Southern Hawker and the Brown Hawker.
- Some aquatic beetle larvae feed on decaying wood, others eat fungi and algae on the wood surface.
- Caddis larvae use leaves and tree bark to build their cases.
- Bare coarse leaf litter is a vital underwater habitat for some species, including the uncommon Downy Emerald dragonfly, whilst rotting leaves are a food source for detritivores like freshwater shrimps.
- The tangles of submerged roots of willows provide a habitat for crawling water beetles and mayflies.
- The muddy edges of shady ponds can be an important habitat for the larvae of many insects.
- Trees shelter ponds: creating suntraps and providing a wind break for delicate-winged insects including emerging and adult dragonflies and rare animals like the Pondweed Leaf-hopper.

Downy Emerald dragonfly larvae live amongst submerged leaves in woodland ponds



©Paul Ritchie

Trees, leaves and rotting wood provide important habitats for a range of dragonfly species



Southern hawker dragonfly egg-laying into wood at the pond edge



©Rodtuk

## Amphibians and trees

Amongst Britain's native amphibians all, except the Natterjack Toad, benefit from having areas of woodland nearby: studies have shown that ponds with adjacent wood or scrub have significantly more species of amphibians than ponds surrounded by open country.

## Birds and mammals

Trees and scrub at the edge of a pond can be beneficial to birds and mammals in many ways:

- Sallows (*Salix spp.*) growing out from the edges may form embayments which water birds use to define territories.
- Fallen trees provide good nest sites for Moorhens and other water birds.
- Ponds with hedges and scrub next to them are good nesting places for farmland birds like Tree Sparrow.
- Woodland ponds are a very important habitat for drinking and feeding bats.
- Adjacent trees and scrub give cover for shy animals such as deer to approach the water to drink.



©Kim Taylor/Warren Photographic

Woodland ponds are an important habitat for bats, which need to drink as they emerge from, and return to, their woodland roosts

## Reasons for managing trees

Trees are often removed around ponds for *amenity* purposes, because too many trees and too much shade make ponds look gloomy and overgrown. They are also sometimes removed to reduce the number of leaves falling into the pond since these can hasten the rate at which ponds fill in.

There can also be good *conservation-based* reasons for removing trees: particularly in areas where tree-growth is recent. Many ponds in lowland Britain have become far more shaded over the last 30-50 years, largely as a result of the decline of extensive grazing. This is a particular concern in semi-natural areas like heathlands, commons and marshlands, which do not have a history of tree cover, and where important pond plant and animal communities have been lost because of the lack of traditional grazing along pond edges.

**Shading out of sensitive plants:** On the heathlands and grassy commons of southern England, almost extinct plants like Starfruit, and Adder's-tongue Spearwort, which are associated with open ground at the pond margin, have been shaded out by encroaching trees and shrubs. These trees need to be removed to have any chance of reinstating their traditional communities.

### Box 1. Benefits of removing young trees



©Martin Hammond

The wonderful ancient pingo ponds on Thompson Common, Norfolk, are stacked full of rarities including many relict beetles from the end of the last ice age. Traditionally, large areas of the common were grazed. Most of the site's rare plants and animals were not adapted to tree shade, and declined as grazing pressure dropped over the last 20 years and woodland and scrub grew up. Recent removal of this secondary woodland has benefitted many pools: particularly increasing the growth of Tussock Sedges and the many rare aquatic invertebrates that live amongst them.

**General diversity:** removing portions of the canopy in heavily shaded ponds can often increase the cover of herbaceous plants and grasses in and around the site. This will provide additional food and habitats for aquatic and marginal invertebrate animals. Adult hoverflies, for example, like to feed on flat-topped flowers of plants like Fool's Watercress and Hogweed.

It is likely that the ponds which will benefit most from such tree removal are:

- (a) Ponds which have become shaded for a relatively short time, say 5 - 30 years (but sometimes up to 60). Such ponds may still retain an important plant seed bank from before they were shaded.
- (b) Ponds located in intensive landscapes (e.g. arable fields), which are usually already degraded and support an even more impoverished flora and fauna when shaded.

**Shading out amphibians:** most amphibians prefer to have tree cover nearby, but some clearance may be necessary to allow plants to grow and provide areas of warmer water, which will encourage frogs and newts to spawn. To facilitate this, ideally leave 25% or more of the pond unshaded. However note that it is illegal to remove trees from around ponds with Great Crested Newts without a proper licence. All of the Great Crested Newt's habitats are protected by law, and since they often hibernate amongst tree roots, it is likely that trees or scrub immediately surrounding Great Crested Newt ponds will be part of the newt's legally protected habitat.



## Wooded pond types which need particular care

There are some instances where particular care is needed to ensure that management does not damage the existing value of a wooded pond.

**Ponds in long established woodland**, with mature trees over 50 years old, can have specialised species adapted to woodland conditions. Trees around these ponds should not be cleared unless a good survey has demonstrated the absence of important species.

**Ponds with *wetland* trees:** When managing ponds, make a distinction between wetland trees (principally Alder and willows) and more terrestrial trees.

Think of wetland trees as a natural part of the pond flora. Goat Willow and Grey Willow (or sallow), in particular, are unusual trees in that they root freely into water. So, for example, overhanging boughs touching the water surface will send out tangled root bundles into the water column. The submerged portion of willow trunks will do the same.

In a pond, these 'mangrove swamp' like areas, where trees and branches grow *in* rather than *over* the water, provide a good underwater habitat, used by newts and many aquatic invertebrates, including uncommon species. Where such habitats exist, value them. Where they do not, try to promote them; maybe at the expense of more 'terrestrial' trees which simply line the bank.

**Temporary pools full of leaf-litter:** Recent evidence suggests that this most uninviting of pond types – dank leafy depressions created as old ponds begin to fill in – can have an important fauna, including rare ground beetles which specialise in this habitat. So take care if there are only one or two examples of this sort of pool in an area, and make sure they are not destroyed.

**Ponds with important archaeological features:** Tree growth can damage archaeological features, but so too can tree management. Winching out tree roots, for example, may be more damaging than leaving them in place. On sites of possible archaeological interest, take advice from the archaeology department of your Local Authority.

### Don't remove trees from this pond!



Ponds located in old woodland areas need to be properly surveyed before they are managed – whatever they look like

It may *look* like a pond in dire need of management – but this pond in a traditionally wooded part of the New Forest, Hampshire, that supports rare invertebrate animals particularly associated with wooded ponds

## Unpredictable effects from managing trees

Practical experience over the last few years has shown how difficult it is to predict the effect of removing trees from a pond.

The difficulty is that individual ponds vary considerably in their seed banks, sediment and water quality. In some cases the effects of removing some trees from around ponds can be beneficial, encouraging greater plant and animal diversity.

In other cases, tree removal has undoubtedly been damaging, particularly when increasing light levels has allowed the domination of unwanted plant species. In ponds with deep sediment, for example, a thick covering of duckweed will sometimes develop across the pond after shade is removed, usually with little benefit to pond wildlife or aesthetics. Cutting trees down around ponds often leads to unpredictable consequences. To prevent this, tree clearance should usually be done a little at a time, and the effects monitored.

More worryingly, removing shade can sometimes allow vigorous species to suppress less competitive and often more uncommon plants and animals.

At a nature reserve in Kent, for example, a pond that supported high quality flora, including uncommon plants like Fine-leaved Water-dropwort and the floating liverwort *Riccia fluitans*, was gradually opened up to light by tree felling. The result was initially beneficial, encouraging greater spread of the uncommon plants. However, progressively greater clearance allowed other emergent plants to colonise and spread. This included Bulrush which took over the pond during the next five years, ousting the uncommon plants and turning a valuable pool in dappled shade, into a sunlit but species-poor Bulrush marsh. 20 years later both uncommon plants are now extinct at the site.

The conclusion from this sort of experience is that it is important to proceed carefully with the management of shaded ponds, monitoring long-term, and taking time to look at the effects of tree removal as it occurs.

In the Kent case, for example, a better option would have been to (i) undertake a small amount of tree coppicing, (ii) monitor the abundance of plants at the site for two or three years, then, (iii) using that information, stop further tree felling and control the Bulrush.



As a charity, we rely on donations to create free resources accessible to all. Please support our work by making a donation here:

<https://freshwaterhabitats.org.uk/get-involved-2/support-us/make-a-donation/>



## Some broad guidelines

There can be no exact prescription for the amount of shade a pond should have. Each pond should be judged on its own merits depending on what is likely to benefit from, and what may be harmed by, the management.

Clearly trees, leaves and woody debris may be of considerable importance to aquatic and wetland species, and as a result management of tree-fringed ponds needs care. Some general guidelines are:

- In areas where there are only a few remaining shaded ponds, it is advisable to retain remaining examples where possible.
- There is likely to be a good argument for removing surrounding trees and opening up the canopy in sites where trees have grown up in the last 30 or so years, particularly ponds: (a) on traditionally grazed heaths and commons or where the land use has been converted from grazing to arable (b) in areas where overgrown and shaded ponds are common.
- In moderate or high risk ponds (see Survey and Assessment factsheet), particularly in old wooded areas, a survey of the pond should be undertaken before any tree removal work is considered, with emphasis on assessing: a) aquatic, marginal and semi-terrestrial animals including ground beetles, b) shade-loving plants such as mosses and liverworts.
- Where surveys are not feasible in moderate or high risk landscapes, then the main rule should be to avoid drastic changes until the effects are better understood. In particular:
  - Avoid removing a *large* proportion of the leaf litter, branches or fallen trees from the pond.
  - Prevent any attempts to clear-fell a *continuous* belt all around the pond to 'open it up'.
  - Think carefully before removing substantial areas of *willow* where it grows *in* the pond itself: it can provide many valuable habitats.
  - If in doubt, manage gently: don't remove more than a 1/4 of the trees from a pond over a 3 year period.
  - Most importantly, before further management, monitor the effects of tree removal over 2+ years and let the results guide future actions.

Away from the pond, encourage and maintain trees and scrub where they provide other functions. For example:

- Where they link ponds to other habitats (e.g. scrub, hedges, heath, rank-grassland, marshland), to allow movement of amphibians and small mammals.
- Where they act as buffer zones providing a screen from agricultural sprays when adjacent land is under intensive arable use.
- Where trees or shade could help to support or encourage use of the pond by uncommon species known to occur in the area.
- Provide warmth and shelter to pond wildlife in exposed areas.



©Peter O'Connor aka anemoneprojectors

Because the effects of tree removal are unpredictable, take it slowly and monitor before continuing: opening-up a pond can sometimes mean that it just becomes covered in duckweed

## Practical tree management methods

Two main options are available for managing trees:

- Pollarding, coppicing or trimming.
- Removing trees completely.

### *Pollarding, coppicing and trimming*

**Pollarding:** Willows, in particular, respond well to pollarding (i.e. cutting trunks or branches off at about head height). However, care needs to be taken with very old trees which may not regenerate well. If in doubt, get a skilled contractor to undertake the work.

**Coppicing:** Coppicing trees involves cutting trunks and branches off at base level and leaving them to re-grow. Where a tree has multiple stems, the cuts are sloped outwards so that water does not collect in the centre of the tree and encourage rotting.

As a rule, trees and scrub should be cut in winter when leaves have fallen. However, take care to consider other inhabitants. Note that amphibians may be hibernating in coppice stools. If these are likely to include Great Crested Newts because there are known to be near-by populations, the management operation should be licensed by Natural England, Scottish Natural Heritage or the Countryside Council for Wales.

If possible, use any cut wood to create hibernacula (e.g. wood piles) for amphibians. Leave some dead wood in the water if none is already present.

### *Removing trees and people*

If tree removal is necessary in public areas, it is important to consult widely and explain the reasons clearly to local people to avoid misunderstandings.

Check with the local authority that trees do not already have Tree Preservation Orders before any work.

If large trees are to be removed by volunteer groups rather than contractors it is necessary for group members to receive training in tree-felling and stump treatment (e.g. from TCV).