

What makes a good pond?

Ponds in a national context

Ponds are defined as any permanent or seasonal body of water between 1m² and 2 ha in surface area (1 ha = 100m x 100m), which would normally hold water for at least 4 months of the year. The definition is very broad and within it are contained a wide variety of pond types and pond communities.

We know that ponds are very important for biodiversity: around 2/3rd of all freshwater plants and animals can be found in ponds (c.400 wetland plants and at least 2500 invertebrate species), approximately 10% of our rarest species (including more than 100 Section 41 species) and 1 in 5 ponds in semi-natural habitats support at least 1 Red Data Book species.

We also know that ponds are one of our most threatened habitats. Estimates suggest that Great Britain lost more than 2/3rd of its ponds in the last century, with numbers having dropped from around 1.5 million to the current total of c.500,000. Encouragingly, results from the most recent national survey of ponds, undertaken as part of the government-funded Countryside Survey by Freshwater Habitats Trust and the Centre for Ecology and Hydrology, suggest that the decline has now stopped and pond numbers are increasing again (Williams et al., 2010). However, the real problem appears to be one of **pond quality**. Nationally, over 80% of ponds are in poor or very poor condition, and only 10% remain in an un-degraded state. Unlike pond numbers, the pond quality situation is getting worse: the number of very poor ponds increased by 20% between 1996 and 2007.

As a matter of urgency we need to identify where the best remaining ponds are and ensure that they are protected and managed sensitively to maintain the characteristics which make them excellent wildlife ponds. We also need to be realistic about what we can do to restore ponds which are already degraded, because the underlying issue may limit the effectiveness of certain actions and some management may do more harm than good.

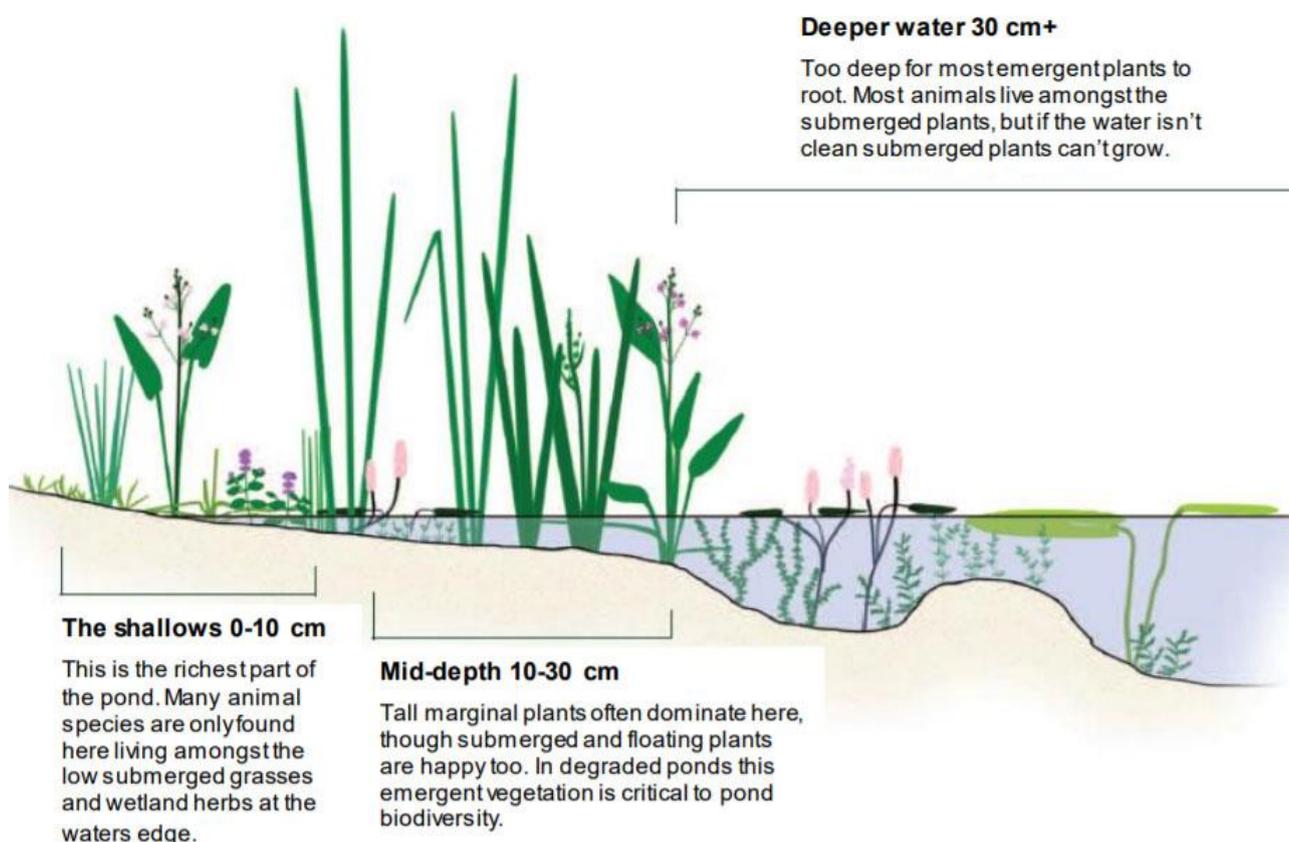
What makes a good wildlife pond?

There is much information from surveys across the UK about the characteristics needed to produce the best ponds for wildlife.

- 1. Clean water.** The most important factor influencing the wildlife value of a pond is whether or not it is fed by clean, unpolluted, water. This generally means water with low levels of nutrients (like nitrates and phosphates) and heavy metals, and no pesticides or other manmade chemicals. In the wider countryside, ponds which are fed directly from rainfall or from groundwater aquifers will have cleaner water than those connected to rivers, ditches and streams. In semi-natural landscapes ponds should be free from pollution, and as a result support communities which depend on high quality clean water and are therefore very vulnerable to even small pollution events.
- 2. Ponds free from heavy disturbance.** In areas of public access, unpolluted and high quality clean water ponds are impacted because of activities such as fishing, duck feeding and regular disturbance by dogs. The water becomes cloudy and turbid, and the pond becomes unable to support submerged plants. With no underwater habitat left aquatic animals rapidly decline. In contrast, the gentle disturbance associated with low density grazing animals is highly beneficial and a vital pond management technique (see 4. below).

- Broad shallow margins.** Most pond animal species live in very shallow water at the edge of the pond in water which is between 0 and 10 cm deep. Often ponds which are well vegetated can appear to have dried out – but if we consider it from the point of view of the invertebrates and plants which only need a few centimetres of water, we find that many ponds still have plenty of water. Many ponds are naturally temporary or have wide, shallow drawdown zones – an area of mud and vegetation which is flooded in winter and spring, which progressively dries as water levels fall in summer.

Figure 1 Identifying the most important habitats for pond wildlife



- Moderate grazing can help to increase biodiversity.** Grazing can prevent single plant species from dominating a site. Animal grazing and hoof poaching creates patches of bare ground where a wider range of non-competitive plant species can germinate.
- Trees and shade.** There is a perception that shade is bad for pond biodiversity and that trees should be removed to allow light to the water and open up views across a pond. This is often not the case. In fact, in semi-natural habitats, tree shade and leaf litter, combined with clean unpolluted water, are important habitats for a number of species found only in ponds which have areas of significant shade and tree cover.

Willows in particular are a valuable habitat because their branches root where they touch the water creating a complex underwater habitat in which invertebrates and amphibians can find refuge. In late successional ponds (those nearly filled-in with silt), mature trees in the pond margin may fall, creating new pools in the root-hole and the depression caused by the fallen trunks.

Overall, tree removal around ponds should be considered with care. It is a far better policy to replace late successional ponds with new ponds to maintain a range of pond ages and pond types to support the greatest number of species at the landscape scale.

When should ponds be managed?

When managing ponds the best approach is to consider pond management at a landscape level. Ideally the objective is to ensure that all of the different types of pond in an area are maintained, to maximise the chances of keeping the very wide range of species that ponds support across a region. This means retaining shallow, seasonal and deep ponds, new ponds and silty ponds full of vegetation, grazed ponds and wooded ponds.

Ideally ponds should be surveyed before management, especially in landscapes of high nature conservation interest. In areas where there is limited survey data available it is still possible to undertake pond management, using a risk-based approach to decide the likely effect of management on the pond's biodiversity.

Essentially:

- If the pond is fed by polluted water, silty and heavily shaded and located in an arable or intensively urban area with few, if any, plants then the chances of the pond having species of conservation concern is quite low. In this situation, dredging to remove (what are probably) polluted sediments is likely to be beneficial, at least in the short term, and bank re-profiling, and possibly tree removal, may also be helpful. Management of this type is unlikely to be damaging but may only bring short-term improvements because the underlying issues, typically due to water pollution, are still likely to be affecting the pond.
- If the pond is in an intensive or semi-intensive land use area (e.g. improved grassland) and the pond looks interesting (e.g. has stands of wetland plants), then be cautious and precautionary with management: retain a good area of all the plant species or habitat types that are present in the pond.
- If the pond is located in any kind of semi-natural habitat (e.g. old woodland, heathland, unimproved grassland), or in or adjacent to long established wetland areas like river valleys, fens and grazing marsh, there is a high probability of it supporting endangered or rare species, even if the pond looks uninteresting.

In these high risk places it is better to explore other options, such as new pond creation, as an alternative to management.

This is not to say that management can never be carried out. Pond management in high quality landscape may be required to:

- Protect the population of a very rare species; but then the precautionary principle should apply so that no habitats are lost during management works.
- Refine the design of a newly created pond or an older pond which at the time of its creation did not have design elements suited to local biodiversity.
- Reduce access pressures on the pond, for example by allowing scrub to develop which shields the pond from disturbance.
- Maintain the variety of ponds types in the landscape. For example, a pond in woodland which is undergoing coppice work or reversion to heathland may benefit from management work.

In an area where many ponds are likely to have high biodiversity value or support populations of rare species, a survey of plants, invertebrates and amphibians will be required before management work begins. It is important to note that even ponds which look unappealing can be uniquely valuable.

For further details please see **The Pond Book** from the [Freshwater Habitats Trust](#).

Williams, P., Biggs, J., Whitfield, M., Thorne, A., Bryant, S., Fox, G., and Nicholet, P. (2010) *The Pond Book: a guide to the management and creation of ponds*. 2nd edition, Pond Conservation, Oxford.