

# What makes a good wildlife pond?

This guide summarises some of the basic information about how to recognise pond wildlife habitats to help you make good pond management decisions.

## Good wildlife habitats

Plants and animals use a surprisingly wide range of habitats in ponds; and not all of them are immediately obvious. Areas of bare, sparsely-vegetated mud, for example, are an important substrate for annual wetland plants. Tiny pools at the edge of the main pond can sometimes be as valuable for animals as the pond itself, and grasses straggling out into the water from the bank can be one of the richest of all habitats in a pond, and an area much loved by newts.

The Sections below identify some of the most important habitats in ponds and the ways they are used by pond wildlife. For more information see the introductory sections of management guides in this series.



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Water beetles particularly love areas of low growing grasses.



A persistent myth about ponds is that water levels need to be stable throughout the year and that any fluctuation can be damaging. In most ponds, nothing could be further from the truth.

Seasonal drawdown is a predictable event in the vast majority of ponds. Indeed, natural ponds typically have a water level drop of about half a metre during the summer months. This water fluctuation exposes a seasonal 'drawdown zone', which is flooded in winter and spring, but which progressively dries out, and grows in size as water levels drop in the summer.

The ever-changing drawdown zone is one of the most important areas of a pond, and is an exceptionally rich habitat for plants, invertebrates, amphibians, birds and even small mammals.

### *Bare mud in the drawdown zone*

If a pond is grazed by livestock or trampled by people, falling water levels will often expose a bare muddy or stony drawdown zone. The mixtures of bare ground and occasional plants here provide an important habitat for a wide range of invertebrates. Some pond animals use the drawdown zone mud during the wet phase; others when it is damp or dry; and some synchronise their life cycle with the seasonal change in water levels.

Dragonflies like the Southern Hawker and the Brilliant Emerald, for example, often lay their eggs in the damp exposed drawdown zone, perhaps to avoid fish predation in the period before their eggs hatch.

The damp and dry pond edge is also used by many semi-terrestrial animals including snails, spiders, fast running ground beetles and shore bugs. This is also a favoured feeding ground for many wading birds, and even small mammals like water shrews use it, catching insects trapped in the mud.

*Different types of drawdown zone: Both well vegetated and bare drawdown areas create good wildlife habitats*



# Flagship ponds

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## Vegetated drawdowns

The drawdown zone is particularly critical for wetland plants, because the seeds of many marginal wetland plant species need exposure to air before they can germinate.

Where pond margins are not grazed or trampled, the drawdown zone will often be dominated by tall rushes and sedges. These provide a habitat for terrestrial insects and birds that need dense cover. Leaf litter that accumulates at the base of tall plants is also an important habitat for many wetland insects.

Ponds which *are* grazed typically support a wider variety of the less vigorous, low-growing wetland plants, together with very different invertebrate communities.

## Small pools in the drawdown zone

In ponds with exceptionally broad margins, the drawdown zone is often undulating, creating tiny temporary pools around the edge. These wet patches can be either muddy or vegetated, but they are invaluable habitats, usually supporting many water beetles and sometimes uncommon species of plants and animals.

## Very shallow water

Most people think of shallow water as 10 - 30 cm deep. Pond naturalists think of shallow water as only 1 - 2 cm deep, and always head for this part of the pond first because, surprisingly, it is usually the richest part of any waterbody for pond animals.

## Wetland plants

Wetland plants are one of the most valuable components of any pond; they are important in their own right and they also provide a vital habitat for many different kinds of animal. For example, every part of a Bulrush is used by animals, from the tiny Bulrush Bug living in the flower heads, to Water Voles that eat the succulent growing tips and the Ruddy Darter dragonfly which lives in sediment around its roots. The importance of plants means that any pond management practice which involves removing them needs to be carefully thought through.

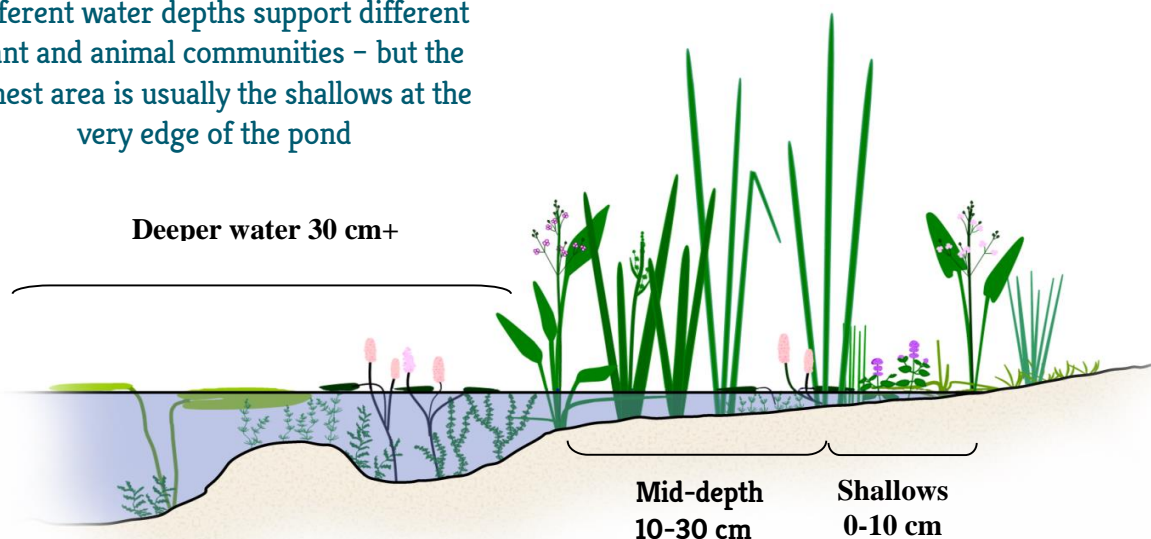
Of all marginal plants that grow in ponds the most under-rated are the low-growing semi-floating grasses like the lawn grass Creeping Bent and the sweet-grasses (*Glyceria* spp.). They are never mentioned in pond guides or included in 'planting lists' and, indeed, are often pulled out of ponds. This is a pity because these carpeting grasses provide an excellent habitat that encourages pond diversity. They are much loved by amphibians, particularly newts, and are preferred by many invertebrates, such as water beetles and water scorpions. Sometimes 20 - 30 species of water beetle alone can be found amongst the low grasses at the water's edge.



©Martin Hammond

Low-growing semi-floating grasses are an excellent habitat for newts and water beetles

Different water depths support different plant and animal communities - but the richest area is usually the shallows at the very edge of the pond





# Flagship ponds

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## Aquatic plants and deeper open water

Traditionally it's been believed that deep open water is a vital component of a successful wildlife pond. In fact, deep water is one of the more specialist pond habitats, used by a relatively small number of species.

Having said this, although deeper water (i.e. water more than 30 - 50 cm deep) is not vital in a pond, it can be valuable for some species. Diving ducks, for example, find much of their food in water more than one m deep. Bats often prefer to drink and hunt over open water that is clear of surface vegetation. Where dense stands of submerged plants are present some aquatic insects can thrive even in the presence of predacious fish in this deeper zone.



Bare open water is one of the poorest areas for wildlife – most animals need the structure underwater plants to live amongst and shelter them from predators

The submerged plant species most commonly found in ponds reach a maximum diversity in quite shallow water, 20 - 60 cm deep. But specialised plant species, including some rare stoneworts, can sometimes be found in deeper ponds particularly where these sites have very clean clear water.



Dead trunks and branches in the water are a valuable habitat for animals like dragonflies, which like to lay their eggs into the soft rotting wood

## Trees and wood

It is often believed that shade is undesirable and that trees should be removed from the margins of ponds. In reality, trees and scrub can bring a variety of benefits to ponds and many species have adapted to the conditions they create. Dead logs in the water, for example, are a favoured egg-laying site for hawker

dragonflies; fallen branches are used as bird-nesting site; leaf litter on the pond bottom is used by caddisflies for their cases and newts for egg-laying. Submerged tree root bundles are a good underwater habitat for newts, mayflies and beetles.

### Box 1 Most pond animals live in water just a few centimetres deep.

In a recent experiment using artificial ponds with zones of differing depth, the richest part of the pond for animals was shown to be the *very* shallow water (less than 10 cm deep). This had two or three times as many species as deeper water zones that were 30 or 50 cm deep.

## If in doubt about a habitat....

If in doubt about whether a habitat will be valuable for aquatic pond animals, or about which habitats are worth encouraging in a pond, think first about *the underwater structure of that habitat from an animals' point of view.*

Most dragonflies, water beetles, mayflies, snails and other pond creatures are tiny animals, about the length of a thumb-nail and often less. Their first need in a pond is for suitable living-quarters where they can feel protected. Anything *under the water* which provides this protection will be useful and the more complex it is in structure, the better.

Open water is usually the most species-poor habitat in a pond because it is the most dangerous. Even tall plants like Bulrush may look lush above water, but their underwater structure is often quite simple, with lots of open water areas around the stems. This means that although Bulrush may be a useful animal habitat in a pond, it not usually the richest.

Pond edge areas which have underwater complexes of wetland herbs and grasses are usually the most diverse areas in any pond. Other structures can serve a similar purpose, including dense stands of submerged plants in open water areas, the underwater root mats that grow out from willows and even the spaces between coarse leaf-litter or gravel at the bottom of a pond.



Shallow underwater plant mosaics create an underwater architecture which is an excellent habitat for many pond animals



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## The surrounding land

The idea that ponds are isolated islands in a sea of dry land has appealed to some writers, but has little biological reality.

Ponds, like all freshwater habitats, are closely linked to other nearby ponds, lakes, rivers and wetlands as a result of the constant movement of plants and animals between them. Indeed, the ability to move between water bodies is a particularly characteristic feature of many pond species. In addition to the serendipitous movement of seeds, spores and eggs by wind and bird's feet, many pond species have their own direct mode of transport. About 70% of pond animals including dragonflies, caddisflies, and most beetles and bugs can fly at some stage of their life, enabling them to disperse directly to other waterbodies in the surrounds.



Ponds are not necessarily isolated habitats – many pond animals, like damselflies, can fly at some stage in their life cycle and will move between different ponds or wetlands in an area.

Many pond animals also use the land around the pond during part of their life-cycle. Adult dragonflies roost amongst tall vegetation and hoverflies emerge from the pond to feed on the nectar of flowers in the surroundings. The larvae of many water beetles emerge to pupate in damp ground around the pond, and then return to the water as adults.

The land around a pond is also part of its catchment: the area that provides its water supply. Thus, the more intensively a catchment is managed, the more likely the pond is to be contaminated by pollutants.

For this reason, the best land-use around a pond is usually non-intensive land such as un-fertilised grassland, heathland, bog, woodland or scrub. Where this is not possible, a buffer zone around the pond will always be beneficial. On intensively farmed land, where fertilisers or pesticides are sprayed, broad swathes of tall vegetation such as rank grassland, hedges and scrub can be especially useful, both as a habitat and as a physical barrier to intercept pollutants in spray drift.

## Pond succession & pond types

Succession is the process that occurs as ponds mature and fill in. It usually involves two elements:

- the water getting progressively shallower as the pond fills with sediment from the bottom; and
- marginal vegetation creeping out from the edge so that the area of marsh increases.

Usually the end point of succession is a seasonal pond which is wet in winter but which dries up in summer. This is a very stable state that, in some ponds, can persist for hundreds, sometimes thousands, of years.

Interestingly, the end point is not usually 'dry ground', as often assumed. Dry ground is usually only the end point of succession where (a) large inputs of *inorganic* sediment (such as sand and silt) are coming into a pond from floodwater or a stream inflow, or (b) if there has been artificial drainage in the area, or a dam has broken.

Because succession is an entirely natural process that has been repeated constantly throughout geological time, it should be no surprise that all stages of pond succession are of value to wildlife. Newly created ponds, old silty ponds and ponds which are now marsh or wet woodland all have their own specific value and communities.



A new pond: all stages of plant succession from bare new ponds to old overgrown ponds are good for wildlife

New ponds usually support plants and animals that are well adapted to colonise and survive in the bare open habitats. Plants and animals which need these conditions will often not survive in more mature and well vegetated ponds – so a constant supply of new sites may be needed to maintain their population in an area.

As a pond fills with sediment and becomes progressively shallower, the community it supports will also gradually change. However, there is no evidence that the pond's conservation value will inevitably decline; rather it will support a different group of species which is likely to be just as valuable.

Some wildlife managers have started to exploit the process of succession. For example, in the Norfolk Broads new turf ponds have been specifically created and allowed to grow over, because their late successional stages are known to be associated with particularly rich fen communities, including specialised plants such as Grass of Parnassus and Marsh Helleborine orchid.