

Pond Creation & Enhancement: A Guide for Landowners

Why have a pond?

Government grants and conservation organisations often encourage the creation and management of ponds, but why are they so important? A pond is a 'transition zone' between the land and water. It can attract a huge variety of wildlife as well as storing water and being an attractive 'feature' of a farm. A pond provides a breeding place for frogs, toads, and dragonflies, as well as food and habitat for a host of other aquatic and land based creatures, from grass snakes, to water voles to kingfishers. In periods of drought, a pond is literally an oasis in a desert; it can provide a drink for grazing stock and wildlife, and a refuge for many species which may otherwise struggle to survive. It has also recently been proved that ponds store huge amounts of carbon and so are very important for mitigating climate change.

Before you build or manage a pond, consider why you want one. Is it for wildlife, for stock, for water treatment purposes, for recreation or just for personal pleasure? The purpose of the pond will heavily influence the design. This leaflet is aimed at helping you make informed decisions about when, where and how to manage and create ponds on your land.

Although a pond is no substitute for good soil and land management, ponds can also be specially designed to absorb run off from farm buildings and farm yards, helping to remove silt and nutrients, and slow down water before they reach your fields or local rivers.



Farm pond built for education
and wildlife

Things to consider before building or managing a pond

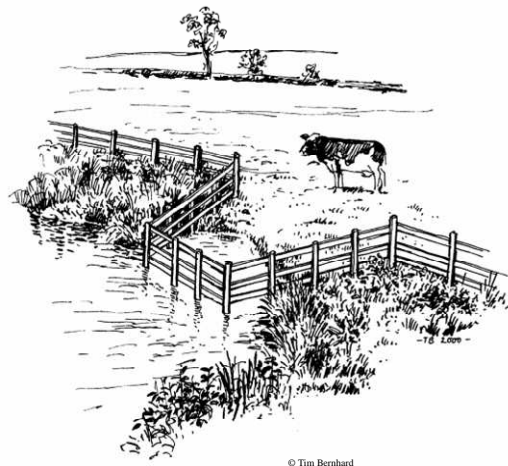
- Any pond is better than no pond, and naturally occurring ponds are the most valuable
- Creating a new pond is better than managing an old pond
- Some ponds such as hammer ponds and dew ponds can have significant historic value
- Ensure that your pond is not being built on habitat that is already important for wildlife i.e. fen or chalk grassland
- If you are creating a pond in a floodplain, you may need consent from the Environment Agency
- It is better and cheaper to create a pond without using artificial structures or bunds if possible

- Do you need to buy pond plants? If you let pond plants arrive naturally, its amazing what will turn up without you needing to plant it
- If you feel you must plant up your pond, use only plants that are found locally
- Stocking ponds with fish often damages wildlife, and can affect plants, nutrient and oxygen levels
- Do not transfer plants or animals between ponds. There are a number of non native invasive species which can reproduce from small root fragments, and which can take over and ruin your pond, and there are frog diseases and other diseases that can be transferred between ponds.
- Try not to 'flood' valuable habitats such as ghyll woodlands & herb-rich meadows to create a pond
- Some poaching of a pond is desirable but fence part of the bank to limit trampling and grazing
- A pond does not need to have stable water levels all year round. A 'draw down' zone or area which is flooded in winter and spring but not in summer, is an exceptionally rich habitat

What is the best time of year to build and clear a pond?

It is best for most wildlife to clear vegetation, coppice or de-silt in early autumn (Sept – Oct). When clearing ponds or the vegetation surrounding them, consider whether birds are still nesting before carrying out work. If digging a new pond, a pond dug late in the year, is more likely to fill up naturally with rainwater, and the digging process is less damaging to water voles and other wildlife at this time of year.

Pond fenced to create 'cattle drink'



Where to put a new pond

There are no hard and fast rules about where to put a pond but the more natural the pond the better. Consider:-

- Whether there is a natural source of water (i.e. a spring or rain water)
- If you can dig the pond in ground which will not drain freely. This precludes the need for concrete or pond liners and significantly reduces costs
- Can you locate the pond near an existing area of wetland as part of a wetland complex
- Whether existing habitats of value (wet or dry) could be damaged by pond creation
- Whether you have any 'junctions' where ditches meet, and you can 'shave off' corners of fields to create a pond
- Larger ponds in areas exposed to wind can suffer from wave erosion of the banks. Wind blown seeds and insects can however help your pond to colonise quickly
- Position the pond in a place that the sun will reach it. Ponds which are shaded may be colder and less productive. Too many decaying leaves from trees can also use up oxygen and cause the pond to become stagnant.

To manage or not to manage?

Managing an existing pond

It is generally better to manage only part of a pond at any one time.

Managing vegetation in the pond

- A pond full of vegetation is not a bad pond. Often, quite the reverse is true. Many aquatic plants and particularly reeds help to oxygenate the water, to break down pollutants and to remove silt.
- If removing vegetation from a pond, leave the vegetation to drain for a few days on the banks. This allows aquatic creatures to return to the water before vegetation is destroyed.
- Hand clearance of vegetation is less destructive to wildlife than machine clearance (although more time consuming).
- Be careful when disposing of vegetation cut from your pond. The best thing to do with native species is to compost it. Non native plants should be placed in a black plastic bag and allowed to rot. Be aware that large amounts of rotting vegetation near a pond can increase nutrient run off into the pond and can decrease its value for wildlife in the long term.

Managing vegetation around the pond

- If overgrown, coppice scrub surrounding a pond to reduce shading and leaf fall, and increase light and warmth reaching the pond
- Clear vegetation from the South side of the pond first, where most warmth and light will penetrate
- You don't have to pull trees out by the roots, coppicing and pollarding helps to create a variety of wildlife habitats and niches

Desilting

- If possible only desilt part of a pond at any one time
- Make sure you can dispose of the silt away from any existing areas of wildlife interest
- Maximise your time with the digger by creating spits, bays, shelves, islands and a varied bank profile



Non native carp can be damaging to a pond © Environment Agency

Keeping your pond healthy

- Try to ensure that only clean water enters your pond by using buffer strips and good farm practices
- If you know that agricultural or surface run off is entering your pond, then be prepared to clean and de-silt it more regularly than a pond with a clean water source
- Too many ducks add nutrients to your pond which encourages algal blooms and decreases its value for wildlife
- Never stock a wildlife pond with fish – they eat much of the wildlife interest and bottom feeders such as carp disturb silt and stop plants growing
- Be patient for the first year or two, plants and wildlife will arrive of its own. If nothing colonises you pond after more than a year, only then should you think about stocking it with local pond plants.

How to make your pond good for wildlife

A pond which is ideal for wildlife will have:

- A minimum area of 4 - 5 square metres.
- One area of minimum depth 80 cm (2½ feet) preferably 1m, so that not all of the pond freezes over in winter and there are some deep refuge areas for things like newts.
- A clean water supply. Because ponds often don't have clean, fresh water flowing through them, pollution and nutrients can become trapped in pond silt and pond water. Once in a pond, they can cause long term management problems such as algal blooms and fish deaths.
- A natural water supply. Tapped water contains chlorine and other additives. Spring water or rain water is best.
- A shallow sloping area, to allow birds and other animals easy access.
- A range of depths, to provide appropriate positions for different plants.
- A marsh or boggy area.
- A mosaic of vegetation and habitat types both in and around the water – submerged and emergent plants, floating and rooted plants, piles of dead wood, earth and rocks, islands and peninsulars, bare mud and thick vegetation, scrub, green plants and trees.

Legal Considerations

- If you are desilting or digging a pond within 8 m of a main river, you will need to contact the Development Control department of your local Environment Agency for permission.
- If you are damming a watercourse or building a structure such as a weir, you also need permission from the Environment Agency.
- If you create a pond or lake over 25,000 cubic metres of water, you may be liable to stipulations under the Reservoirs Act.
- Larger ponds or lakes may need planning permission from your Local Authority. Ponds which are built for agricultural purposes may have fewer planning restrictions. Planning laws may differ within different Local Authorities.
- Stocking ponds with fish can often be bad for wildlife. Consent from the Environment Agency is usually required before stocking a pond with fish, particularly if the pond is 'on line' (i.e. has a water channel flowing through it) or the fish are not native.
- Very young children can drown in just 5 centimetres of water, animals can also become stuck in silts and marshy areas. You may wish to consider fencing deeper areas of ponds in order to avoid this.



Non-native Pennywort plant smothering ditch



Parrot's feather (*Myriophyllum aquaticum*) – one of the non-native invasive plants which reproduce from root fragments © Trevor Renals

Native pond plants for your pond

If you do decide that you wish to plant some native species in your pond, here is a list of plants that you might like to consider.

Plant type	Scientific name	Common name
Oxygenators	<i>Ceratophyllum demersum</i> <i>Myriophyllum spicatum</i> <i>Ranunculus aquatilis</i> <i>Callitriche stagnalis</i> <i>Hottonia palustris</i> <i>Potamogeton crispus</i>	hornwort, spiked water-millfoil, water crowfoot, water starwort, water violet, curled pondweed.
Floating	<i>Polygonum amphibium</i> <i>Hydrocharis morsus-ranae</i> <i>Potamogeton natans</i> <i>Ranunculus aquatilis</i> <i>Stratoites aloides</i>	amphibious bistort, frogbit, broad-leaved pondweed (not small ponds) water crowfoot, water soldier.
Emergent	<i>Menyanthes trifoliata</i> <i>Sparganium erectum</i> <i>Ranunculus lingua</i> <i>Butomus umbellatus</i> <i>Iris pseudacorus</i>	bogbean, branched bur-reed, greater spearwort, flowering rush, yellow flag.
Marginal	<i>Sagittaria sagittifolia</i> <i>Veronica beccabunga</i> <i>Ranunculus flammula</i> <i>Caltha palustris</i> <i>Myositis scorpioides</i> <i>Mentha aquatica</i> <i>Alisma plantago-aquatica</i> <i>Veronica anagallis-aquatica</i>	arrowhead, brooklime, lesser spearwort, marsh marigold, water-forget-me-not, water mint, water plantain, water speedwell.
Marsh & Fen	<i>Lysimachia nummularia</i> <i>Cardamine pratensis</i> <i>Lycopus europaeus</i> <i>Epilobium hirsutum</i> <i>Eupatorium cannabinum</i> <i>Stachys palustris</i> <i>Filipendula ulmaria</i> <i>Lythrum salicaria</i> <i>Lychnis flos-cuculi</i> <i>Junus</i> spp and <i>Carex</i> spp	creeping jenny, cuckooflower gipsywort, great hairy willow-herb, hemp agrimony, marsh woundwort, meadowsweet, purple loosestrife, ragged robin, rushes and sedges.



Native yellow flag iris © Wildlife Trusts

Pre planted coir fibre and willow spilling

If you need to protect pond banks from wind/wave erosion, or you wish to speed up plant colonisation then one of the most effective ways is to peg down mats of coir fibre pre planted with native plant species. These are available from various suppliers including www.salixrw.com/site/product-bio-coir.htm . Willow spilling is also useful for protecting banks naturally (www.willowbankservices.co.uk) as are reedbeds.

Establishing reeds

Please refer to SORP Advice sheet 'How to Create and Manage Reedbeds'. The best and cheapest way to establish reeds (if you have permission to remove them, are not damaging existing habitat by removing them, and are sure that they are not 'infected' with non native invasive plants), is to use turves cut from local reedbeds (preferably on your land) or soil removed from ditches containing reed roots.

Do Not have these plants in your pond!

There are some plant species sold in garden centres/which have escaped into the wild that threaten our native wildlife and can lead to accidental drownings. These plants are usually non-native species from the southern hemisphere. They can cause great damage by completely taking over the native ecosystem. Check with your supplier if they know the plant is native. If they cannot guarantee it then don't plant it.

Plants to avoid include:

Water Fern / Fairy Moss – *Azolla filiculoides*
Swamp Stonecrop – *Crassula helmsii*
Floating Pennywort – *Hydrocotyle ranunculoides*
Parrotsfeather – *Myriophyllum aquaticum*
Skunk cabbage - *Lysichiton spp*
Canadian pondweed - *Elodea canadensis*
Himalayan balsam – *Impatiens glandulifera*
Water Primrose – *Ludwigia grandiflora* (aka *Jussiaea*)
Curly Waterweed – *Lagarosiphon major*

Pond linings

There are several materials which can be used to line a pond, such as clay, concrete and pre-formed linings. Ideally aim to line ponds with local, puddled clay. Pre-formed linings tend to have sides that are too steep for wildlife, and which prevent the build-up of silt. The second best solution is probably a flexible lining. The options are polythene, PVC, or butyl rubber. Polythene is the cheapest. Butyl rubber is the most expensive, but it is the most durable. If your pond is small then providing an underlay of carpet offcuts can prevent puncturing of the lining. Try not cover all the lining with mud, turf or similar. Pond liners degrade much quicker when exposed to sunlight.

Funding and financial considerations

There are obvious costs associated with building a pond. The following may be of help when budgeting for pond building:-

Available grants and funding

A number of Government grant schemes promote the creation and management of ponds. At a local level, local councils may be able to provide Wildlife Enhancement Grants for the creation of ponds, and local Wildlife Trusts and other organisations may be able to help you source funding for pond creation. Contact your local Parish council as many of them carry out Parish Pond Surveys.

Organic Entry Level Stewardship (Natural England aka Defra)

Funding is available for buffering ponds from agricultural activities, and protecting archaeological features i.e. Hammer ponds.

Higher Level Stewardship (Natural England)

Payments are available for the maintenance of ponds of high wildlife value < 100 sq m (ponds with a local or national wildlife designation such as SSSI, or with a known special wildlife interest such as the presence of a local Biodiversity Action Plan species. www.biodiversitysussex.org). Also, ponds that demonstrate a characteristic flora and/or fauna, have a reliable source of good quality water and a naturally fluctuating water level. Unsuitable ponds include those with invasive species, ponds dominated by Common Reed, Bullrush (*Typha latifolia*) or Elodea spp and ponds where the water supply is polluted. Payments are also available for the maintenance of ponds of high wildlife value > 100 sq m which are of particular value to wildlife, e.g. because they support rare or threatened species or because of the diversity of wildlife which is present. Grants may also be available for creating reedbeds.

Maintaining your pond

Once established, a pond should need relatively little attention. During the initial phase, algal growth may occur. If tapwater was used to fill the pond then this may be the reason as it can contain high levels of nutrients. Keep nutrient levels low by using rainwater to fill the pond or let tap water stand for a couple of days before adding to pond. A tightly bound bundle of twigs or straw will provide habitat for microscopic animals and so keep algal growth down. A bag of charcoal floated in the pond can also help absorb pollutants and nutrients and improve water quality.

Removing the algae from the water will also remove nutrients. If you remove any algal/plant growth, you should stack it at the side of the pond for a few days, this allows pond creatures to make their way back to the pond. Encouraging native water snails also helps as they eat algae. Remember that it may take a season or two for a new pond to settle down and find its own balance. Do not panic if the water turns green or one plant species seems to take over for a while. Things should stabilise provided the three “pond pariahs” are avoided – fish, ducks and non-native plants!

Further information

The Pond Book – A guide to the management and creation of ponds. Pond Conservation. (1999).

Making a pond - www.yptenc.org.uk/docs/factsheets/env_facts/making_a_pond.html

Useful Contacts

Wildcall

Free wildlife advice
01273 494777

Sussex Otters and Rivers Project

(01273) 497555
www.sussexotters.org

Environment Agency

08708 506506
Ask for your local Fisheries, Recreation and Biodiversity team, or for Land Drainage Consent

Pond Conservation Trust

www.pondstrust.org.uk

The Sussex Otter and Rivers Project (SORP) is a partnership between Sussex Wildlife Trust, South East Water, Environment Agency and Southern Water Services. SORP promotes the sustainable management of Sussex rivers and the restoration of wetland habitats for both people and wildlife, and in particular the Otter, Water vole and Black Poplar tree.

