

LANDSCAPE CONSERVATION - PONDS



By definition a pond is a small body of water, between one metre square and two hectares in area, which usually holds water for at least four months of the year. Since the last war many thousands of ponds have been lost across the country, either through neglect or being filled in, and they are still being destroyed at an alarming rate. Fortunately some are now restored and many new ponds are created every year. A well-designed man made pond can be beneficial to wildlife and become a valuable landscape feature.

Ponds are often of special nature conservation interest and provide unique habitats for many animal and plant species as well as forming features of landscape and historic importance.

In recognition of the importance of ponds in the landscape, Kennet District Council offers grants for their restoration and construction. The purpose of this leaflet is to provide information on the restoration and construction of ponds.

Ponds and Nature Conservation

The nature conservation interest of ponds within the District is a reflection of their diversity and the wide range of landscapes in which they are found; from the permanent ponds close to the lowland water table, to the seasonal dew ponds constructed as watering points for sheep on the highest parts of the chalk downland of Salisbury Plain and the Marlborough Downs.

Many lowland ponds are semi-natural and located in areas of ancient woodland or unimproved meadows. They usually have a catchment area which is not intensively farmed, which provides a natural unpolluted water source and well established habitats in the surrounding landscape.

Some ponds are seasonal and dry out for part of the summer. They vary in size from a few square metres to over a hectare. These ponds contain specialised plants and animals which can cope with summer drought and include some of Britain's rarest species such as the Fairy Shrimp (*Chirocephalus diaphanus*), which is found in seasonal ponds and puddles on Salisbury Plain.

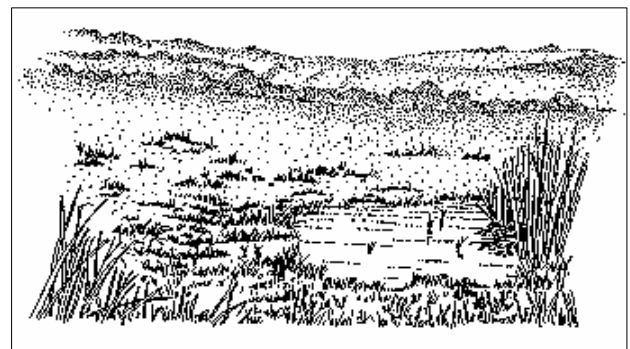
Seasonal ponds in ancient woodland are usually densely shaded and contain large quantities of leaf litter providing specialised habitat for many invertebrate species, in particular flies and water beetles.

The construction of a new pond can provide any of the habitat types described above, although the choice is usually to provide a permanent pond with its attendant flora and fauna.

Amongst the species that are important in pond habitats few are more significant than the amphibians ie: frogs toads and newts. These species can live in permanent or seasonal ponds so long as there is water present for the tadpoles to develop. Established ponds which have sufficient shallow, warm water and few fish are ideal for

amphibians. Frogs may colonise a new pond naturally, however, if the pond is too isolated spawn can be introduced. It is better to allow toads and newts to colonise of their own accord as they are not easy to introduce artificially. Fish are a natural part of the fauna of most large ponds, but extremely high numbers can have an adverse affect on other wildlife. This is worth remembering when stocking a new pond. Larger ponds attract ducks such as mallard and other water birds including coots, moorhens and herons and can help to create the pond environment, although again large numbers can be detrimental to other species.

Almost half of Britain's 3,500 species of invertebrates can be found in ponds, with dragonflies, mayflies, freshwater beetles and water snails being common. Grazing and trampling by cows, horses and sheep creates small temporary pools that can host a variety of shore bugs and water beetles. However, heavy grazing can disturb nesting wildfowl and ruin the margins of small ponds.



A well established lowland pond

The wider the variety and greater the density of plants in a pond the more wildlife it can sustain, although it is necessary to ensure that a pond does not become choked with weed and continues to afford some free swimming space for fish and to allow light to permeate to depth. Plants colonise most natural ponds very quickly and therefore large scale planting is unlikely to be necessary. Sometimes, however, more extensive planting will be advantageous if the intention is to improve the pond visually in a short space of time. Marginal trees are beneficial to ponds in several ways; birds, small mammals and insects all use the cover that trees provide, whilst water beetles and snails can be found in their submerged roots. Fallen branches, wood fragments and leaf litter underwater are colonised by fungi and algae which are food to a variety of pond species. However, ponds that are completely shaded are likely to support fewer species, although this can be beneficial to some species. Excessive levels of decaying litter in ponds will create an anaerobic environment and may result in the release of toxins into the water to the detriment of all species.

Ponds of Historic Interest

The landscape of the Kennet District is by and large man-made. It follows that almost all of the ponds are man-made or have been managed. Most of the ponds have agricultural origins. The exceptions to this tend to be ponds with industrial connections such as Wilton Water which supplies the Kennet and Avon Canal; ornamental, fishing and wildfowl ponds; and more recently ponds created specifically for nature conservation.

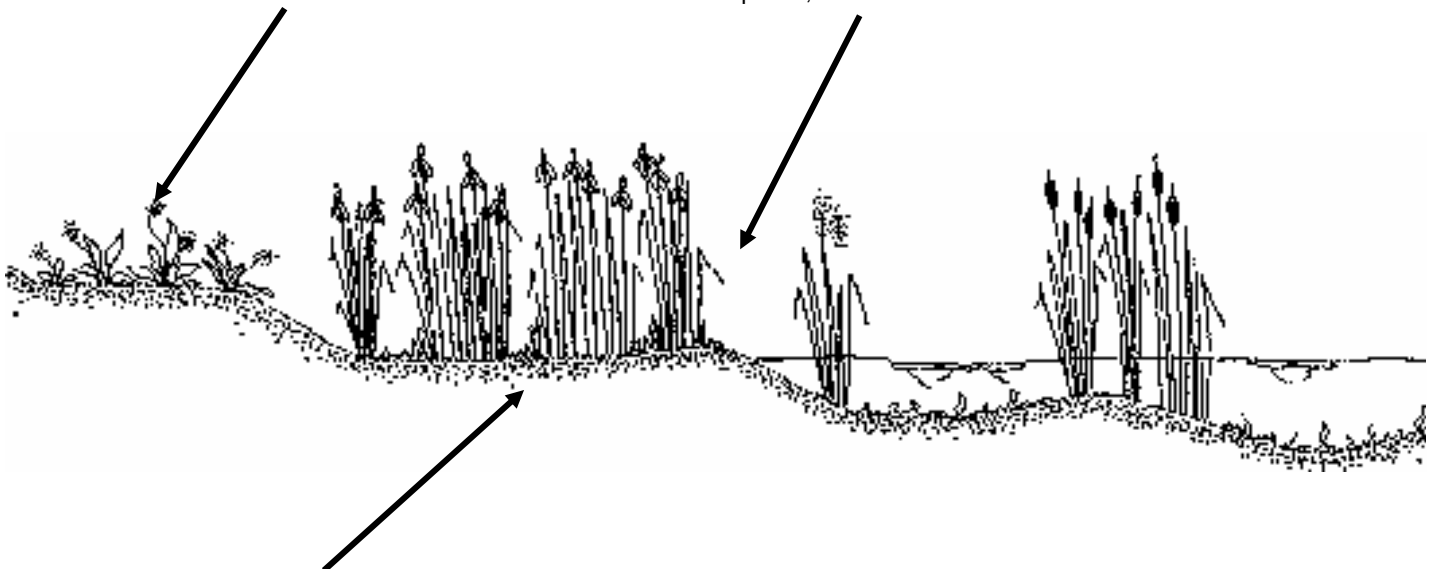
Many villages and most farms had their own ponds to provide drinking water for stock and facilities for cleaning farm equipment. Most village and farm ponds within the District have been filled in or become silted to such an extent that they are little more than grassy depressions in the ground. Urchfont is almost unique in retaining its village pond with a traditional puddled clay lining. The pond at Aldbourne has been restored along with Seymour Pond at Burbage and The Horse Pond at Seend. The Horse Pond is of particular significance in that it is constructed on an impervious rock base rather than clay.

The dilemma of the future function of a restored village or farm pond is often difficult to resolve. Should nature conservation or the historic context take precedence? This has to be considered on a case by case basis. Seymour Pond at Burbage has been restored with a nature conservation bias, but The Horse Pond at Seend has been restored to retain its historic construction and features.

The numerous Dew Ponds of the Marlborough Downs and Salisbury Plain were constructed to provide water for sheep grazing on the hills and using the drove roads. These ponds were constructed of puddled clay until late in the nineteenth century. Many dried out during the summer months, although some held water throughout the year. They required regular maintenance which has long since ceased with changes in farming practice and the military use of large parts of Salisbury Plain. As a result the vast majority of Dew Ponds are little more than depressions in the downland landscape.

The surrounding land: Numerous pond species use the surrounding land during part of their life cycle. In an ideal situation a 'buffer zone' (an area of non-intensive land use) should be created. Buffer zones act as a natural filter, add diversity to the landscape as well providing a habitat for pond animals.

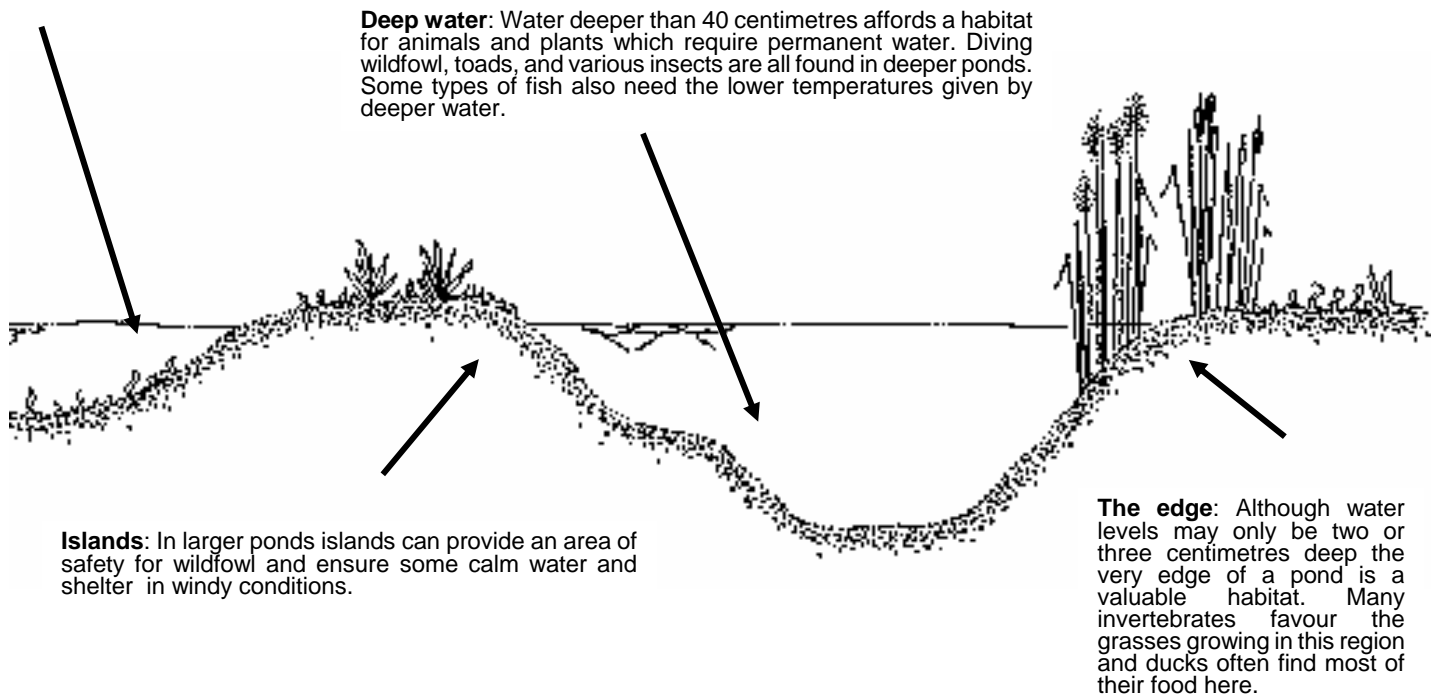
Marshy areas: Flat low lying land around a pond with gently sloping banks combine to make marshy areas that flood in winter and dry out in the summer. A very rich environment for plants, invertebrates and small mammals.



Drawdown zone: This area may have stands of tall marginal plants and these can provide the only shelter for pond wildlife. If the area is grazed low-growing herbs and grasses, including many less vigorous wetland plants, often thrive.

Shallow water: Water of less than 40 centimetres deep is often warmer with less light absorption than the deepest part of a pond. The underwater vegetation is often varied and quite dense and fish, water insects, as well as breeding amphibians thrive here.

Deep and shallow water offer totally different habitats so there is no ideal depth for a pond. A rise in water level during the winter months and a drop in the summer is natural and beneficial.



Pond Restoration

It is necessary to assess the benefits and disadvantages of restoration before undertaking such a project and a number of factors must be taken into account.

Water quality varies naturally depending on source and surroundings. It should not be polluted in any way either from run off or directly. Water levels in ponds vary considerably (e.g.: in seasonal ponds) and any change in source or natural water levels can be detrimental.

Sediment and its build up is entirely natural and causes change in ponds. It is not generally harmful, although excessive sediment can make a pond too shallow. Care should be taken when removing sediment especially if using modern machinery which can have a drastic affect on an area in a very short space of time. The quicker the change, the greater the damage to wildlife

Generally the greater the variety of flora and fauna species in a pond the greater the value of the site, although there are exceptions. High densities of wetland plants are not necessarily a problem but if control measures are necessary they must be introduced gradually so as not to disturb the habitats of the pond. The removal of a few trees around a pond can be beneficial but expert advice should be taken before any work takes place. A careful balance between light and shade is required. However, trees growing within a pond can cause damage to the impervious lining with their roots.

It is important to find out whether a pond is clay-lined. Dredging and other works can damage the lining and repair work is not only difficult but expensive as well. Many old or dry ponds have leaks in the clay lining which will require repair. To achieve this the pond should be almost empty and relined using suitable clay - a technique known as puddling.

There are several organisations which can help with assessing a pond and these are listed on the back of this leaflet. Once these factors have been assessed a management plan can be drawn up. This does not have to be a complex document, it is often easiest to use a series of site maps and short notes. The plan should include the following :

- Background information such as history, present use and statutory designations.
- A site assessment (see above).
- Present management, if any.
- A work programme, covering the restoration and future management
- Photographic records and species lists.
- A diary of work undertaken.

Pond Construction

There are a number of factors to consider when creating a new pond which should be researched carefully before construction begins.

Depending on the size of pond to be created the relevant authority should be consulted. The Environment Agency will licence or grant permission for several procedures including impounding or abstracting water, making a reservoir, land drainage and fish stocking. The Local Planning Authority need prior notification of any plans to build a pond (other than a garden pond) and planning permission may be required.

Existing flora and fauna should be assessed and advice taken from the Farming and Wildlife Advisory Group or Wiltshire Wildlife Trust. Certain species are protected under the Wildlife and Countryside Act 1981.

The source of water (surface, ground or spring) and its quality should be evaluated and advice sought from the Farming and Wildlife Advisory Group or the Environment Agency.

Soil will either be permeable (e.g.: chalk or greensand) or impermeable (e.g.: clay). A series of trial pits or holes should be dug over the area to see how the soil and water table level varies. The results will determine what type of pond lining is required. Professional help may be needed to carry out an accurate landform assessment.

The telephone numbers of these organisations can be found on the back page of this leaflet. If in doubt always consult!

Design and Construction

A pond can be created for a variety of reasons but those of interest in this document are those which provide wildlife habitats and those constructed for amenity reasons, which includes ornamental ponds and lakes. Good design can maximize the benefits of new ponds for wildlife. If a large space is available it is possible to create several ponds each with differing habitats, but diversity is also possible in a smaller area.

Construction type differs depending on the location and purpose of a pond, and expert advice should be sought especially if the pond is to be on a large scale. It is not possible to give fully detailed instructions as to the construction of a pond in this leaflet but the major considerations for design are outlined below:

'On-stream' ponds are excavated in the bed of a stream. This may appear to be simpler than other methods but there are several disadvantages. On-stream ponds are difficult to excavate, have no facility for regulating flow and can silt up very quickly. 'Off-stream' ponds where flow is diverted into an excavated pond with feeder channels from the main flow are a more straightforward and generally less expensive method of construction

There are two types of below ground ponds: water table sites which involve excavating below the water table and surface water sites which may require lining and filling with water diverted from an existing source.

Above ground ponds can be constructed either by impounding water in gently sloping land retained by a low bank and allowing the area to flood or using a method known as 'cut and fill' where excavated soil is used to build water retaining embankments.

Trial pit results will show if a pond can retain water naturally, and if not, what type of lining is required. The traditional method of lining is puddling for which a good local source of clay is essential. The pond must not be allowed to dry out completely during re-lining as the clay will crack. Other materials suitable for pond lining include Bentonite, a special form of powdered clay which becomes watertight when wet. It is not recommended for small scale ponds due to cost and practical problems associated with its use.

Also suitable for smaller ponds is butyl-rubber, a heavy duty rubber sheeting which is normally guaranteed for up to fifty years but its high cost makes it impractical for larger ponds. A cheaper alternative is heavy duty polythene which is usually installed by a contractor as it can be difficult to handle. Fibre-glass shells are widely available but really only suitable for small garden ponds as they are expensive and provide no design opportunities.

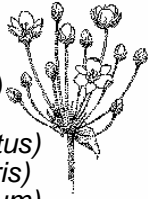
In stony soils a layer of sand or protective matting (old newspapers, carpet or underlay) should be placed beneath the lining. Weedy soils should be cleared and treated first with weedkiller. Large plant species whose roots may penetrate the lining should be removed.

It is vitally important to dispose of excavated material carefully and sensitively. Excavated material should be kept to a minimum and where possible the topsoil used for pond planting and any larger stones placed in or around the pond. Winter is the best time of year to dig a pond as most plantlife is dormant at this time, although with frozen or water logged ground autumn may prove to be more practical! Disposal of excavated material may require planning permission.

Native, preferably local plant species must be used when planting a new pond. Plants from the locality are likely to be well adapted to water conditions and will have a greater chance of survival. It is advisable to look at other ponds in the area before choosing plants. The following is a list of plants that are common in lowland ponds.

submerged rooted plants

Water crowfoot (*Ranunculus species*)
Water milfoil (*Myriophyllum species*)
Starwort (*Callitriche species*)
Shining pondweed (*Potamogeton lucens*)
Curled pondweed (*Potamogeton crispus*)
Fennel pondweed (*Potamogeton pectinatus*)
Horned pondweed (*Zannichellia palustris*)
Rigid hornwort (*Ceratophyllum demersum*)



Floating-leaved rooted plants

Broadleaved pondweed (*Potamogeton natans*)
White water lily (*Nymphaea alba*)
Yellow water lily (*Nuphar lutea*)
Unbranched bur-reed (*Sparganium emersum*)

Emergent plants

Water horsetail (*Equisetum fluviatile*)
Lesser spearwort (*Ranunculus flammula*)
Watercress (*Nasturtium officinale*)
Amphibious bistort (*Polygonum amphibian*)
Water plantain (*Alisma plantago-aquatica*)
Arrowhead (*Sagittaria sagittifolia*)
Flowering rush (*Butomus umbellatus*)



Emergent Plants (continued)

Sweet flag (*Acorus calamus*)
Bur-reed (*Sparganium erectum*)
Reedmace (*Typha latifolia*)
Floating sweet-grass (*Glyceria fluitans*)
Reed sweet-grass (*Glyceria maxima*)
Reed canary grass (*Phalaris arundinacea*)

Marginal plants

Marsh marigold (*Caltha palustris*)
Creeping buttercup (*Ranunculus repens*)
Marsh pennywort (*Hydrocotyle vulgaris*)
Water celery (*Berula erecta*)
Redshank (*Polygonum persicaria*)
Great water dock (*Rumex hydrolapathum*)
Bogbean (*Menyanthes trifoliata*)
Water mint (*Mentha aquatica*)
Rush (*Juncus species*)
Yellow flag (*Iris pseudacorus*)
Marsh woundwort (*Stachys palustris*)
Water forget-me-not (*Myosotis scorpioides*)
Gypsywort (*Lycopus europaeus*)
Purple loosestrife (*Lythrum salicaria*)



Plants introduced from abroad should **never** be used as they can take over ponds becoming impossible to control, dominating native plants and so seriously decreasing the wildlife value of a pond. Do not plant any of the following:

Water fern (*Azolla filiculoides*)
Canadian pondweed (*Elodea canadensis*)
Swamp stonecrop (*Crassula helmsii*)
Curly waterweed (*Lagarosiphon major*)
Nuttall's pondweed (*Elodea nuttallii*)
Japanese knotweed (*Polygonum cuspidatum*)
Giant hogweed (*Heracleum mantegazzianum*)
Himalayan balsam (*Impatiens glandulifera*)



It is illegal to release the last three of these plants into the wild.

A native yet highly invasive plant that should be avoided is the bulrush (*Scirpus lacustris*). Imported ornamental fish are unsuitable for wildlife ponds and will seriously affect native flora and fauna.

Grants for Pond Conservation

Below is a list of organisations offering grants for the conservation of ponds. The amount of grant aid available varies and application forms and further details can be obtained.

Kennet District Council

The Landscape and Countryside Officer
Telephone: 01380 724911 ext: 876

Ministry of Agriculture, Fisheries and Food

Telephone: 01179 591000

Shell Better Britain Campaign

Telephone: 0121 212 9221

Sources of information on ponds

British Trust For Conservation Volunteers (BTCV)

Telephone: 01793 526233

The Environment Agency

Contact: Conservation Officer

Telephone: General Enquiries Hotline 0645 333111

Farming and Wildlife Advisory Group (FWAG)

Contact: Lisa Coward

Telephone: 01225 777839

Wiltshire Wildlife Trust

Telephone: 01380 725670

Pond Action

Pond Action undertakes ecological research into and promotes the conservation of ponds.

The Pond Conservation Group

The Pond Conservation Group promotes a pond protection strategy and consists of several organisations together with a technical advisory group.

The contact for the above two organisations is:

Jeremy Biggs.

Telephone: 01865 483249

