**Overview**

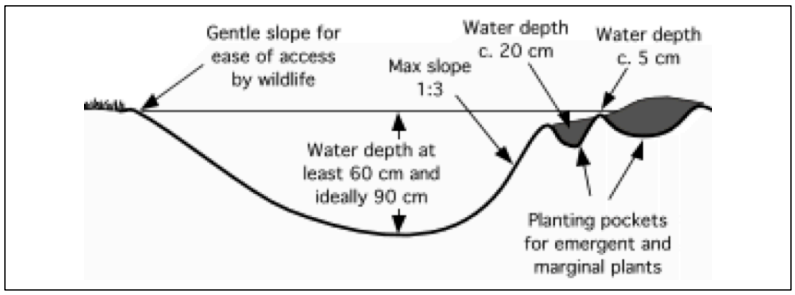
A good wildlife pond may support 1000 different species, from myriads of tiny algae and aquatic invertebrates to dragonflies, newts and bigger animals that come to feed, drink and bathe in the water. Approximately 75% of ponds have been lost in the last 100 years. According to the Wildlife Trusts this adds up to about a million ponds! Natural plant succession means that many of them have gradually silted up, then been invaded by scrub and eventually become woodland. Some have had their value diminished by the introduction of fish or terrapins which eat newts and aquatic invertebrates. Find out how to create and look after a pond for wildlife below.

**Pond Creation**

Choose a sunny, open spot

Mark out the area to be dug out with canes and string and decide where you will put the soil removed: rich soil could be added to a vegetable patch or used to make a raised bed. Alternatively the soil could be used to make a sunny bank for mining bees or basking animals such as lizards.

Design the pond so that it has different depths in different areas. This will provide a variety of conditions to suit different animals and plants. A shelf along one side is useful for marginal plants. At least one bank should be gently sloping so any animals which fall in (e.g. hedgehogs) can escape. It will also provide an area for birds to drink and bathe.




Measure the proposed pond length, width & depth and calculate the amount of liner needed: depth +length + depth + a little for edges x depth +width + depth + a little for edges. Decide on your pond liner. Various thickness and qualities are available. Butyl rubber is reported to be hard to puncture, is quite flexible and may last up to 50 years. Check the different liners available, ask how long they are guaranteed to last and buy the best you can afford.

Carefully remove turf if present so it can be reused to cover the pond liner at the edges. Dig out the soil, remembering to remove an extra 15-20cms to allow for the liner and a protective layer beneath. Check that the lip of the pond will be at the same level right across the pond by placing a plank across the hole and using a spirit level.

Remove any stones from the hole, compact the soil and line the hole with sand or old carpet so that when you put in the liner it is well padded.

Unroll the liner into the hole, positioning it centrally then pushing it down towards the pond edge. Try not to stand on it or stretch it. To give the liner a longer life, cover it with a layer of protective covering such as polyester matting (available from garden centres) or geotextile (available from builders merchants). The liner edge and protective covering can be buried under soil at the pond edge and covered with the retained turf.

Add rounded stones and/or a thin layer of subsoil mixed with washed sandy gravel to anchor the linings. These will also help protect the liner, provide crevices for small pond animals to hide in and provide a medium for plants to root in over time. N.B. Topsoil will contain too many nutrients and these will encourage excessive growth of algae and duckweed so do not add this to the pond.

If possible allow the pond to fill with rain water. Tap water has a high level of nutrients so do not use this if possible as, like topsoil, it will encourage the growth of algae and duckweed.

**Pond Planting**

Choose suitable native plants from a reputable garden centre or if you know someone with a pond they may be able to give you some plants, since maintaining a pond for wildlife does involve reducing the amount of pond plants on a regular basis (see maintenance section). Don't take plants from the wild. Make sure any plants you introduce to your pond have not been imported as these may bring in diseases and check around them for unwanted extras such as the extremely invasive non-native New Zealand pigmyweed (*Crassula helmsii*) which if it gets into a pond will completely smother and deoxygenate it. Even a millimetre of New Zealand pigmyweed will grow into a whole plant. Other invasive non-native plants to look out for include water fern (*Azolla filiculoides*), parrot's feather (*Myriophyllum aquaticum*), Nuttal's pondweed (*Elodea nuttallii*), Canadian pondweed (*Elodea canadensis*) and floating pennywort (*Hydrocotyle ranunculoides*). These plants, together with water hyacinth (*Eichhornia crassipes*) are so damaging to native wildlife that they are all listed under section 9 of the Wildlife and Countryside Act which makes it illegal to release them into the wild. The native common duckweed (*Lemna minor*) can also cause problems in ponds where nutrient levels are high.


Left: New Zealand Pigmyweed
Right: Floating Pennywort

Plenty of ground cover around a pond is also important to protect animals such as frogs, toads and newts which spend most of their lives on land eating small invertebrates and only return to ponds to breed.

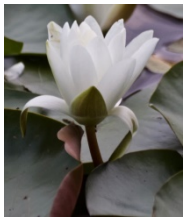
**Plants to Choose**

Different water plants need different depths of water.

Submerged Plants live below the water surface and are therefore sometimes known as oxygenators because when they photosynthesise oxygen passes from them into the water. Examples include hornwort (*Ceratophyllum demersum*) and spiked water-milfoil (*Myriophyllum spicatum*) which can just be thrown into the water and others such as common water-starwort (*Callitriche stagnalis*) and curled pondweed (*Potamogeton crispus*) which may need to be planted in pots which are then put in deep water.

Hornwort

Floating Leaved Plants such as white water-lily (*Nymphaea alba*) on the right and yellow water-lily (*Nymphaea lutea*) need deep water. Their large leaves grow up to the surface and can be useful to shade out some algae and duckweed. Plant in perforated pots into special aquatic compost and then cover the top of the plant pot with gravel. Planting in pots will restrict roots and control too vigorous growth.



Emergent Plants need fairly shallow water (about 15-40cms deep). Examples include water mint (*Mentha aquatic*), yellow iris (*Iris pseudacorus*), water forget-me-not (*Myosotis scorpioides*), Brooklime (*Veronica beccabunga*), water-plantain (*Alisma plantago-aquatica*), branched bur-reed (*Sparganium erectum*) and arrowhead (*Sagittaria sagittifolia*) Plant in perforated pots as above, then place the pots on the shelf so the plants are not too deep.

Left: Water Mint
Right: Brooklime

Marginal Plants live at the water's edge. Attractive plants for the pond margin include Marsh-marigold (*Caltha palustris*), purple-loosestrife (*Lythrum salicaria*), meadowsweet (*Filipendula ulmaria*) and water figwort (*Scrophularia aquatica*).

Left to Right:
Meadowsweet
Marsh Marigold
Water Figwort

Animals will find your pond on their own. Do not introduce fish as these will eat eggs and young of frogs, toads and newts.

**Pond Maintenance**

Ponds naturally decrease in size as pond plants grow and die and other dead plant material (leaves) enters the pond. Over time ponds become marshland and eventually woodland. To keep a pond therefore requires regular maintenance, removing dead plant material and reducing the amount of plants in the pond as they grow and reduce the amount of open water.

Reduction and removal of plants from ponds should be carried out from late September- end of October when there is less activity – young frogs, newts, toads and many invertebrates- such as adult dragonflies have left the pond but those animals which remain are not yet dormant- some frogs and other animals hibernate in the mud at the bottom of ponds.

Lift vigorous plants such as iris and divide, returning about 1/3$^{rd}$ to the pond.

When you remove plants from the pond, leave them at the edge of the pond for 24-48 hours so that some of the small animals in them can return to the water.

In winter cut back any trees which threaten to overshadow the pond to maintain light levels and reduce nutrient input from dead leaves.

Over the years, as silt builds up in the pond and it becomes shallower it may become necessary to partially dredge it. Again this will need to be done late September- October, but only 1/3-½ the pond should have silt removed at any one time and dredged material should be left at the side of the pond for about 2 days, to allow some of the aquatic invertebrates in the silt to return to the pond. Silt needs to be removed very carefully so as not to damage the liner.

In summer, excess pondweed and filamentous algae can be removed by hand, duckweed can be netted. This is important to maintain light levels in the water -essential for the very small and microscopic algae which are food for tiny pond animals and form the base of the food chain in your pond. As above, leave any removed plant material at the edge of the pond to enable small animals to return to the water.