

# DIG A POND FOR DRAGONFLIES



# DRAGONFLIES NEED YOUR HELP

Dragonflies are captivating to watch. You may catch glimpses of their vivid colours as they fly past. Once you have seen one in your garden you will be hooked! Their aerobatic skills rival most birds: they can fly at over 20mph and have the ability to fly in every direction and hover as they hunt, defend territories and chase mates on the wing. Once they perch or bask in sun spots, you will have the chance to see their beautiful colours and if you approach them very slowly, you may get close enough to see the intricate veins in their wings.

Dragonflies spend most of their lives underwater in their larval form. Therefore ponds and other water bodies are essential for these stunning insects to complete their life cycle. Over the past 100 years it has been estimated that one million ponds have been filled in. With fewer ponds, dragonflies need our help. By digging a pond you will be replacing a habitat that has been lost.

## WHAT DO DRAGONFLIES NEED?

**Fresh water:** either standing or flowing.

**An abundance and variety of aquatic plants.** Submerged plants provide habitats for the developing larvae and put oxygen into the water. Emergent and marginal vegetation provides perching, roosting and egg-laying sites for the adults and emergence sites for larvae. Many species lay eggs into floating plants.

**Sheltered vegetation around the pond,** providing shelter for newly-emerged adults and places to hunt and rest.

The best ponds are sheltered from the wind, mostly unshaded and have shallow water margins.. Several British species of dragonfly and damselfly will breed in garden ponds. Access to a garden pond will give you a fantastic opportunity to observe these insects in both their larval and adult form and, if you are lucky, you may witness the emergence of the adult dragonfly from its larval case. While you are watching them, you may be surprised by all the other wildlife that appears at your pond. Ponds provide wildlife stepping stones between other aquatic habitats, as well as being an important habitat in their own right.

### FACT

Dragonflies cannot sting.

They eat other insects, such as midges and mosquitoes, which bite us.



# POND CONSTRUCTION

A pond is a body of standing water between 1m<sup>2</sup> and 2 hectares in area, which usually holds water for at least four months of the year. However, this guidance relates to the construction of small ponds in gardens or small enclosures.

(The same basic principles apply to larger ponds, although construction is more likely to utilise an excavator and/or a flowing-water source and less likely to need a pond liner. In addition, for these larger ponds, you will need to consult the appropriate body [Environment Agency or Scottish Environment Protection Agency] to ensure any necessary legal requirements are met for abstraction and impoundment.)

## Planning

The choice of site and the depth and planting out of the pond are important for success. The bigger your garden pond, the better. Most British species whose larvae live in still water can breed in ponds with a surface area of less than 15 sq. m (160 sq. ft) if the habitat is suitable. The minimum size of a viable pond is about 4 sq. m (43 sq. ft), but aim for the largest pond that you can afford and accommodate. If you have space, consider having several ponds, so that when vegetation starts to take over they can be cleaned out on a rotation.

In Britain's temperate climate, dragonflies love sheltered, sunny spots. So, design your pond to include the provision of shelter from strong winds. Site your pond away from overhanging trees, which may cast shade over vegetation in and around the pond and foul the water with falling leaves. Take care to prevent polluted water reaching your pond (e.g. runoff from nearby roads or intensively farmed land, or streams carrying such water).

Shallow water is important for dragonfly larvae, as it heats up quickly on sunny days. However, a uniformly shallow pond will suffer from reduced oxygen level and perhaps even dry out, whilst in winter it freezes more easily, threatening the aquatic life you want to support. Therefore, it is important to have a sufficient depth of water. The deepest point should be a minimum of 60 cm (2 ft) for a pool of under 20 sq. m (215 sq. ft) and 75 cm (2' 6") for larger pools. There is no need for even the largest wildlife pond to be deeper than 1-2m. Note that you will need to excavate an extra 5cm (2") or so below your chosen depth to allow for liner protection (see below).

The shape of the pond will depend upon individual circumstances; an irregular outline looks more natural and provides a longer edge but do not make the shape too complicated. Vertical sides and sharp corners should be avoided if possible; shallow margins sloping gently down from the water's edge are important for the growth of floating and emergent plants and hence the larval habitat for the dragonflies you wish to encourage. It is important to have shallow areas at the north and west edges of the pond: a ledge 30 cm (1 ft) wide about 20-25 cm (9") below the water level is recommended. By careful design it is possible to create a variety of habitats, thus encouraging a wider spectrum of dragonflies to breed in the pond.

You might wish to consider a raised pond if you have sufficient material (soil, rocks or bricks) to do so. These



A typical garden pond  
© Dave Smallshire



are relatively safe for young children, but amphibians may have difficulty gaining access.

Before marking out the proposed site, check whether there are any underground pipelines or cables. Whether the pond is dug manually or by machine, the surface of the site should be level before you start. Pegs and string enable an accurate outline to be created that can be modified easily. Before digging it is worth considering where to put the waste soil. Perhaps you would like a rock garden or, if the site could do with some extra shelter, you could use the spoil to create a windbreak or bank on which adult dragonflies can bask while sheltered from the wind.



A marked out pond © Rodley Nature Reserve

## Creating a pond using a liner

If you are lucky enough to have a permanently high water table or if your land is on impervious clay, a liner may not be necessary, but usually it is essential. Dig a small test hole first if you think the water table is high, though remember that it may be lower in late summer.

There are four basic types of liner:

### 1. Preformed liner

If you are happy with a smaller pond and more formal appearance, these are available at many garden centres. However, they are generally poor for dragonflies, as their sides tend to be steep with no shallows less than 5cm deep; also it is difficult to dig a hole of precisely the right shape to support the liner.

### 2. Clay

Before concrete and synthetic materials were available, puddled clay was the most common lining. This, of course, depends upon the availability of suitable clay and involves a considerable amount of hard, skilled work. However, if you do happen to live in a clay district this is the best and much the cheapest method, especially for larger ponds. If builders are working nearby, they may well be prepared to exchange clay for topsoil.



A selection of preformed liners © Andy Roberts (Flickr)

An alternative to clay is Bentonite, clay powder that swells in water to become a waterproof clay. Pre-hydrated high-density bentonite sandwiched between two geotextile layers can be bought ready for use (Rawmat - [www.rawell.co.uk](http://www.rawell.co.uk)). Bentonite linings should self-heal when punctured, which means that posts for boardwalks can be driven through them without causing leaks, but they are expensive.

### 3. Concrete

Concrete lining tends to be difficult to install and requires a wire cage to support it. It is also prone to damage during a hard winter and repairs can be difficult. The concrete needs to be applied skillfully and swiftly and must be prepared during good weather. It also needs to be waterproofed. Ideally the pond should be filled, allowed to stand for about a month and then emptied and refilled. This procedure should remove any toxic chemicals that may leach out of the concrete.

## 4. Plastic/Rubber linings

These will be the preferred linings for most ponds. Thin membrane liners are extremely effective and relatively easy to install but are liable to be punctured and may be damaged by exposure to sunlight. Covering the liner prevents deterioration. Ideally look for a material that is ultra-violet stable and has at least a 10-year guarantee.

a) **Polyethylene** is the cheapest lining that should be considered, although it will not last as long as the alternatives. Triple thickness low density polyethylene (LDPE) is stronger than PVC, but less robust than butyl rubber.

b) **PVC (polyvinyl chloride)** is rather more expensive. The cheapest PVC sheeting is likely to be rather thin and therefore prone to damage; although slightly higher in price, 0.5 mm thickness is better, and usually comes with a guarantee of 10 years (life expectancy 15 years).



c) **Rubber** is the most expensive of these three types, but the most durable. Butyl rubber comes in thicknesses of 0.75 mm and (for larger ponds) 1 mm and with a guarantee of at least 20 years (life expectancy 50 years). Synthetic, or EPDM, rubber usually comes in 1 mm thickness and is of similar quality to butyl, but a little cheaper and hence probably the 'best buy'. Trade names include Aqualast Rubber, Epalyn and Firestone Liner. Using a liner allows your pond to be larger and tailored to the space available. When digging out your pond, make allowance for any bedding to be placed under the lining.

When you have finished digging and removing all sharp objects such as stones and twigs, calculate the amount of lining you need to buy. A good guide is:

liner length = pond length (X) + twice the maximum pond depth (Z) + 50cm

liner width = pond width (Y) + twice the maximum pond depth (Z) + 50cm

(The additional 50 cm (1' 8") allows for overlap beyond the pond margin for anchorage.)

For large ponds it may be necessary to join separate sheets of lining material to obtain the desired size. Advice should be sought from the manufacturer or supplier as to how this may best be achieved.

To protect the liner from sharp objects beneath, a 5 cm (2") layer of sifted sand or soil should be placed over the bottom of the pond. This should then be covered with a layer of newspaper, old carpet or a felt or polyester underlay for additional protection.

The lining is then placed (not stretched) over the hole and gently adapted to the shape of the bottom and sides, pleating the creases as necessary. Avoid pulling the lining taut and allow some slack to compensate for shrinkage on cooling after hot weather.



# Filling your pond

Ideally, allow your pond to fill naturally or collect rainwater and use this in preference to tap water. If you have to use a hosepipe, fill gently until the pond is 50-75% full. This minimises disturbance to any bottom substrate that you may have added (see 'Planting') and allows non-rigid linings to stretch and adapt closely to the bottom. If tap water has been used, allow the pond to stand for at least two days before plants or animals are introduced, to allow the release of chlorine from the water.

Allow the liner to settle after filling before fixing the edges. Anchor the edge of the lining with flattish rocks (these may be covered up later as required) or fold the edge down into a narrow trench which later can be filled with soil or stones and covered with turves. If a marshy area is required on one side of the pond, this trench may be made wider and somewhat deeper, but remember to allow extra lining for this.

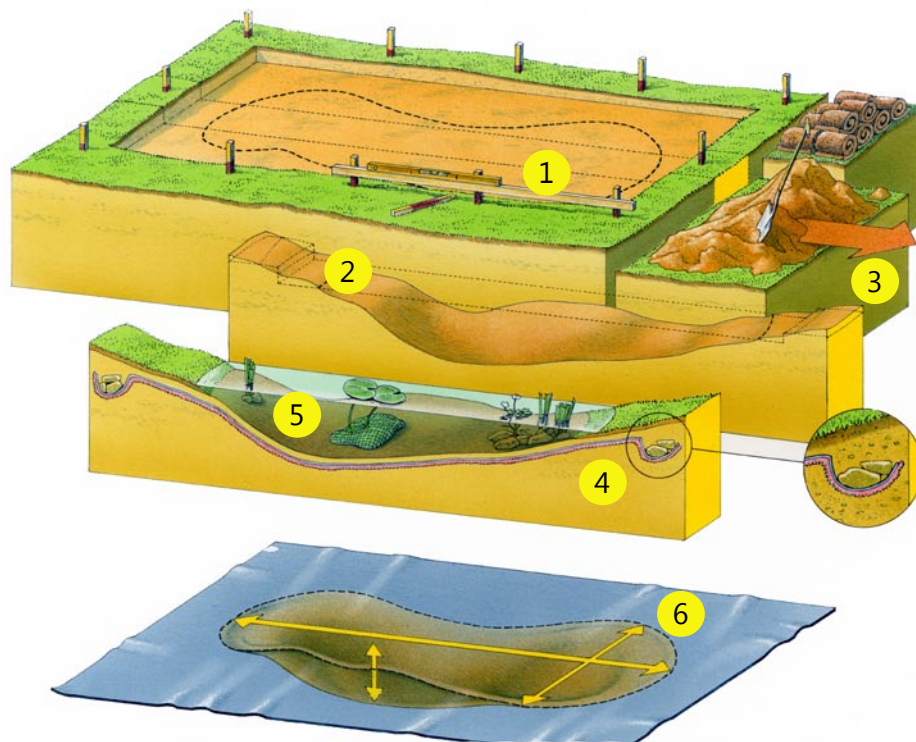


Fig 1. Digging, lining with plastic or rubber and planting a new pond  
(Illustration by Peter Visscher)

**1. Keep it level:** make sure the pond edge is the same height all round. Use pegs, straight board and the spirit level to mark the water level all round the edge. Strip off turf carefully. Keep big pieces to edge the pond; the rest can be stacked on the compost heap.

**2. Profiling and reshaping:** aim for shallow edges. The finished pond must be exactly the same level all round and gently slope down to 50cm depth in at least one spot.

**3. Topsoil:** use elsewhere. Keep a little to put back in the pond.

**4. Liner:** protect the liner (blue in picture) with a 5 cm (2") layer of sifted sand or soil placed over the bottom of the pond. Then cover with a layer of newspaper, old carpet or a felt or polyester underlay (pink) for protection, before laying down the liner. Anchor the liner edge in a trench filled with stones.

**5. Planting tips:** old sprout bags make good containers for submerged plants. Run some turf down into the pond – a good place to plant waterside plants.

# DEVELOPING YOUR POND

## Planting

Garden ponds, are unlikely to vegetate naturally, especially those remote from other wildlife ponds, so you will have to acquire a variety of plants to introduce. It is highly desirable to plant native species, but take time to learn about their growth habits. A range of underwater pondweeds is very important to dragonflies and their various structures create niches for different species.

First, decide where to have access points, so that you can sit or lie close to your pond and enjoy its inhabitants as it develops. You may wish to leave paved or grassed areas for this, which will also provide somewhere you can carry out vegetation management in the future. Avoid planting tall-growing plants near such areas. It is better to allow plants to grow over any exposed liner at the edge of the pond than to put plants directly onto the liner.

Late spring to early summer is the best time to establish aquatic plants. Warm water and longer days encourage growth. Ideally, native species of plants should be chosen but, since no British species of dragonfly is dependent upon a particular species of plant during its life cycle, this can be a matter of personal choice. (See figure 3 and below for a list of suitable plants.) Plants that are not native to Britain and cultivated varieties should not be introduced into ponds in the wider countryside. Flora locale (see References at the end) provides basic guidance on buying native flora. It is possible to buy 'starter packs' of native aquatic plants.

Collecting and propagating cuttings from a local waterbody increases the chances of introducing plants of local genetic provenance (which may not be guaranteed for plants bought from garden centres). Always ask permission from the owner before removing any plant and exercise moderation when collecting. Although some organisms rapidly colonise new ponds, plants and a bucket of water and mud from an established pond will introduce smaller animal life and help to kick-start your pond. **But take care not to introduce problem species (see below).**

Rooted plants are best established using potted plants placed in the desired position. Open-mesh baskets, obtainable from a local garden centre, are ideal and allow unhindered growth as a natural substrate develops. Avoid introducing topsoil into ponds, as it will enrich the water and stimulate algal growth, and do not use any fertilizer. Once a substrate has formed naturally, further plant cuttings may be inserted directly, weighted down with a stone so that they can root.



Fig 2. Aquatic and fringing vegetation in an ideal pond (Illustration by Peter Visscher)



# Suggested planting

## Submerged plants

Important native underwater species include Common Water-starwort (*Callitriche stagnalis*), Spiked Water-milfoil (*Myriophyllum spicatum*), Curled and Fennel Pondweeds (*Potamogeton crispus* and *P. pectinatus*), Rigid Hornwort (*Ceratophyllum demersum*), Water-violet (*Hottonia palustris*) and Water-soldier (*Stratiotes aloides*).

Plant these in 5 cm of fine gravel for anchorage, except Hornwort and Water-soldier, which can just be dropped in. In the absence of native pondweeds, Canadian Waterweed *Elodea canadensis* can be used to absorb nutrients early in the life of a pond, but excessive growth will need to be controlled.



## Floating plants

Native species include Broad-leaved Pondweed (*Potamogeton natans*), Common and Fan-leaved Water-crowfoots (*Ranunculus aquatilis* and *R. circinatus*), Amphibious Bistort (*Polygonum amphibium*), Frogbit (*Hydrocharis morsus-ranae*) and Yellow Water-lily (*Nymphaea lutea*). White Water-lily (*Nymphaea alba*) is suitable for larger ponds. Some of these species have both submerged and floating leaves.



## Emergent and marginal plants

Many species growing in damp soil at the edge of the pond will colonise shallow water and vice versa. As with floating plants, emergents can be planted in baskets with inert material or low-nutrient compost and placed into the water at an appropriate depth.

Native species include Marsh Marigold (*Caltha palustris*), Water-plantain (*Alisma plantago-aquatica*), Water Mint (*Mentha aquatica*), Lesser Spearwort (*Ranunculus flammula*), Greater Spearwort (*R. lingua*), Water Forget-me-not (*Myosotis scorpioides*), Brooklime (*Veronica beccabunga*), Ragged-Robin (*Lychnis flos-cuculi*), Purple Loosestrife (*Lythrum salicaria*), Bogbean (*Menyanthes trifoliata*), Meadow-sweet (*Filipendula ulmaria*), Water Horsetail (*Equisetum fluviatile*), Mare's-tail (*Hippuris vulgaris*), Yellow Iris (*Iris pseudacorus*), Flowering-rush (*Butomus umbellatus*), Branched Bur-reed (*Sparganium erectum*), Lesser Bulrush (*Typha angustifolia*), various rushes (*Juncus* species) and sedges (*Carex* species).

Note that some of these species may become rampant at the expense of other, less suited, species and may need controlling. Except in large ponds, it is inadvisable to plant Common Reed (*Phragmites australis*) or Bulrush/ Common Reedmace (*Typha latifolia*), as these are invasive and their rhizomes may puncture your liner, as may large sedges and Yellow Iris.





# Native plant locations

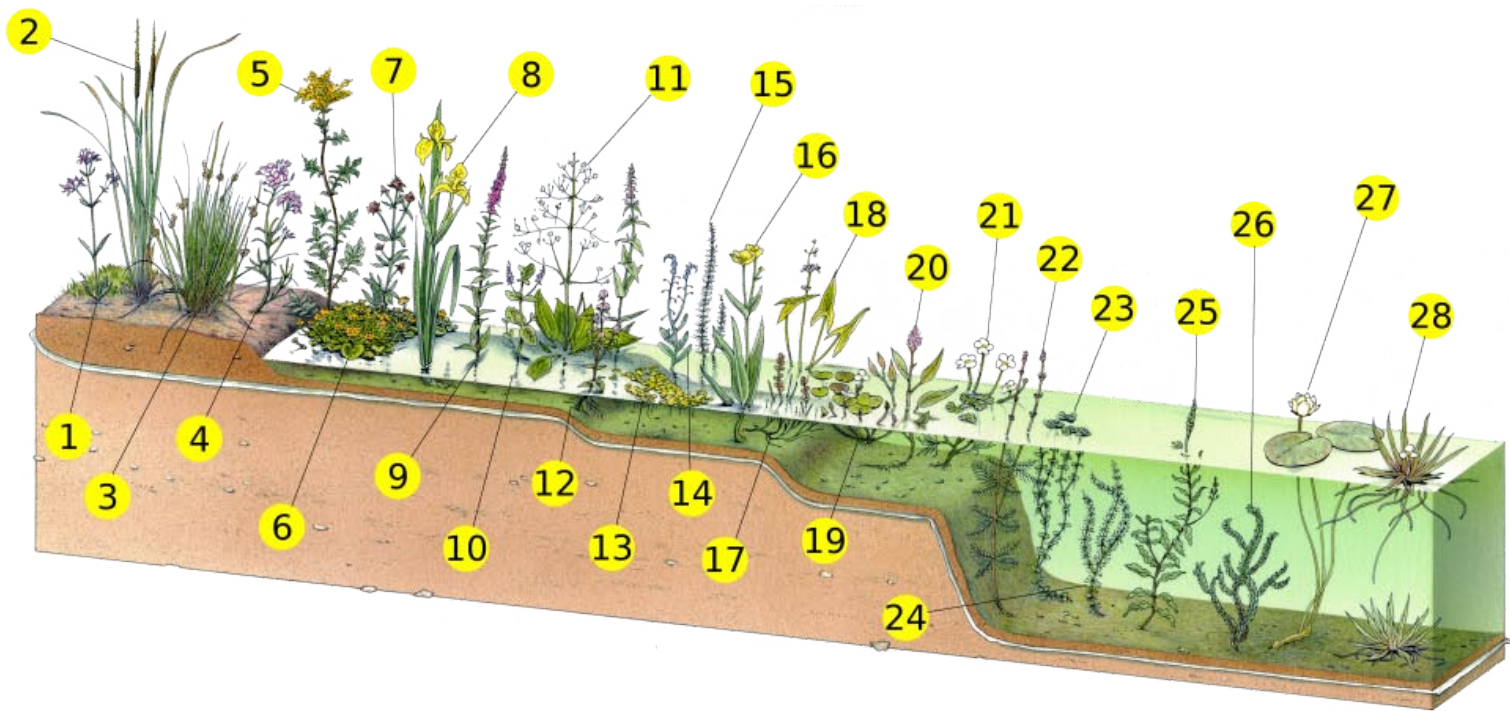


Fig 3. Native aquatic plants and their preferred location (Illustration by Peter Visscher)

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|---|--|
| 1. Ragged-Robin <i>Lychnis flos-cuculi</i>          | 15. Mare's-tail <i>Hippuris vulgaris</i>               |
| 2. Greater Reedmace <i>Typha latifolia</i>          | 16. Greater Spearwort <i>Ranunculus lingua</i>         |
| 3. Soft Rush <i>Juncus effusus</i>                  | 17. Fennel-like Pondweed <i>Potamogeton pectinatus</i> |
| 4. Cuckoo-flower <i>Cardamine pratensis</i>         | 18. Arrowhead <i>Sagittaria sagittifolia</i>           |
| 5. Meadowsweet <i>Filipenula ulmaria</i>            | 19. Frogbit <i>Hydrocharis morsus-ranae</i>            |
| 6. Marsh Marigold <i>Caltha palustris</i>           | 20. Amphibious Bistort <i>Polygonum amphibium</i>      |
| 7. Marsh Cinquefoil <i>Potentilla palustris</i>     | 21. Common Water-crowfoot <i>Ranunculus aquatilis</i>  |
| 8. Yellow Iris <i>Iris pseudacorus</i>              | 22. Spiked Water-milford <i>Myriophyllum spicatum</i>  |
| 9. Purple Loosestrife <i>Lythrum salicaria</i>      | 23. Common Water-starwort <i>Callitriche stagnalis</i> |
| 10. Brooklime <i>Veronica beccabunga</i>            | 24. Common Hornwort <i>Ceratophyllum demersum</i>      |
| 11. Water-plantain <i>Alisma plantago-aquatica</i>  | 25. Curled Pondweed <i>Potamogeton crispus</i>         |
| 12. Water Mint <i>Mentha aquatica</i>               | 26. Willow Moss <i>Fontinalis antipyretica</i>         |
| 13. Lesser Duckweed <i>Lemna minor</i>              | 27. White Water-lily <i>Nymphaea alba</i>              |
| 14. Water Forget-me-not <i>Myosotis scorpioides</i> | 28. Water Soldier <i>Stratiotes aloides</i>            |



# Alien plants to avoid

## Australian Swamp Stonecrop (*Crassula helmsii*)



Fig 4. left: showing the impenetrable mat the plant creates on pond; right: close up of the plant

## Parrot's-feather (*Myriophyllum aquaticum*)



Fig 5. left: showing the dense stands the plant forms on ponds; right: close up of the plant

## Water Fern (*Azolla filiculoides*)



Fig 6. left: showing the thick mats the plant forms on ponds; right: close up of the plant

## Floating Pennywort (*Hydrocotyle ranunculoides*)



Fig 7. left: showing the compact blanket the plant forms on ponds; right: close up of the plant



# Other features

Moving water is an attractive feature and a waterfall or fountain may benefit your pond by providing additional aeration of the water. However, a good growth of submerged plants should keep your pond well oxygenated. Pumps and their filters may kill small animals like damselfly larvae and generally are not recommended for dragonfly ponds.

The wildlife value of many ponds is reduced by stocking them with fish and/or wildfowl. You are strongly advised NOT to keep fish or wildfowl in a pond designed for dragonflies. They may eat your dragonfly larvae, churn up sediment and enrich the water, causing algae to proliferate. If you must have fish, please dig another pond specifically for them!

Dragonflies need warm, sheltered areas away from the pond for roosting sites and as hunting areas with lots of small flying insects for them to catch. The best natural sites include uncut patches of tall grass, rushes and sedges and herbaceous vegetation (such as nettlebeds), brambles and heathers. Cultivated and exotic garden plants and shrubs are less useful, but may be used if they host plenty of insects.



Golden-ringed Dragonfly eating a bee in a garden  
© Scott Randell (CC BY-NC-ND 2.0)



A dragonfly pond ©Joshua Smith (CC BY-SA 2.0)



# POND MAINTENANCE

A new pond is a battleground until the most suited plant and animal species find their equilibrium. As your pond develops it is useful to take photographs at intervals to show the changes in plant abundance. In excess, some plants may dominate others. In the first year or two, you should expect an abundance of algae and/or duckweed (see below).

During warm weather, top up the water level periodically. Ideally, collect rainwater in a water butt, with an overflow into your pond. Avoid adding large quantities of cold, chlorinated tap water suddenly. Tap water is best left in a bucket for a couple of days and added in small amounts.

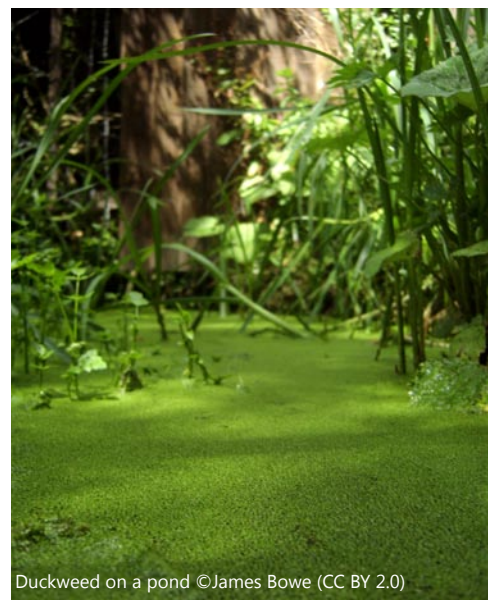


An excess of emergent plants around the margins will lower the water level in summer through transpiration. Unwanted plants, especially of invasive and non-native species (see Figures 4, 5 & 6), should be removed as soon as they start to dominate; they should be composted or otherwise destroyed to avoid contaminating other water bodies. In autumn, try to prevent excessive amounts of dying vegetation, especially leaves, from falling into the pond. Silt and leaf-litter can be removed in winter, but since they provide important habitat for bottom-dwelling larvae the rule is not to be over-zealous. Remove a little at a time and always leave plant material in small piles on the bank for a day or two to allow creatures to crawl back into the water (although you will learn about what lives in your pond by checking it carefully and putting back the creatures you find). Bankside vegetation is best cut in late winter.

Avoid treading on the pond liner during maintenance. If necessary, it may be possible to mend some liners using an underwater repair kit.

## Algal blooms and duckweed

Until the water community becomes a balanced system, it is normal for a new pond to pass through an 'algal phase', which often persists for one or two summers. The water may take on the colour of pea soup, or filamentous algae may clothe the underwater plants or produce a floating mat on the surface ('blanketweed'). Although intractable cases do occur, the problem should ultimately sort itself out. Shade and competition provided by floating and submerged plants, and the grazing invertebrates that they support, should provide a natural control.



Duckweed on a pond ©James Bowe (CC BY 2.0)

These species are more likely to dominate and persist if fertile topsoil or large amounts of tap water have been introduced, or if the pond is fed by water with high nutrient levels. An abundance of pondweed helps to absorb nutrients, while repeated use of barley straw or its extract may reduce algal growth. It is important also to address the cause and prevent further enrichment of the water. Pumps, filters and UV treatment should only be considered for ponds where fish are stocked.

Excessive amounts of algae and duckweed should be removed regularly, first leaving them close to the pond to give invertebrates a chance to return to water. Filamentous algae can be removed by twisting it around a stick and duckweed by skimming off the surface with a fine mesh net, a long cane or a floating rope.



# COLONISATION BY DRAGONFLIES

The rate at which a new pond becomes colonised by dragonflies depends mainly on the distance between the pond and other water bodies supporting dragonfly populations. Most dragonflies are efficient dispersers and find new habitats very quickly. Experience shows that new ponds rapidly become colonised if there are dragonflies breeding within a few kilometres of them.

A few species are renowned for appearing at ponds: the Broad-bodied Chaser has even been known to visit ponds while being filled! However, new ponds take some time to mature and it may take a few years before most species breed successfully in them. Remember also that, although some spend only a year or less as a larva, many species live for two or three years in the larval stage.

## Dragonflies of the garden pond

The following species may be some of the first to colonise garden ponds:



Azure Damselfly *Coenagrion puella*



Southern Hawker *Aeshna cyanea*



Blue-tailed Damselfly  
*Ischnura elegans*



Large Red Damselfly  
*Pyrrhosoma nymphula*



Emperor Dragonfly  
*Anax imperator*



Common Darter  
*Sympetrum striolatum*



Broad-bodied Chaser  
*Libellula depressa*

# RENOVATING EXISTING PONDS

Where practicable, it is sound conservation practice and often less expensive to renovate old ponds rather than create new ones. Plant and animal communities that have already become established can, through careful management, be modified and enhanced. However, a cautious approach is needed to ensure that any existing interest is not destroyed by renovation.

Heavily silted and overgrown ponds should never be cleared completely in one operation. Autumn and winter are the best times and, if clearance is staged over a couple of years or more, natural recolonisation can take place. Unwanted plant growth should be removed carefully and with restraint. Herbicides should not be used, as decomposing plants will reduce the oxygen content of water and may be detrimental to dragonflies and the other animals on which they depend for food.

Heavily shaded ponds may be opened up to expose them to sunlight, either by selective removal of shrubs and trees or by careful pruning, coppicing or pollarding. However, some shaded ponds have a specialised fauna and care should be taken not to destroy that interest.

Temporary ponds which dry up for periods may host specialised plants and animals, such as Fairy Shrimp. Avoid the temptation to deepen such ponds without first checking their existing wildlife value.





# ENJOYING YOUR POND

To help you enjoy your pond, make sure you have somewhere to sit or lie and enjoy the goings-on. Paving stones or short turf at strategic points give easy access to the edge. Special care must be taken where young children have access to a pond. Sensible precautions include a childproof gate into the garden and/or placing a firm wire mesh cover over the pond when children have unsupervised access. Mesh is also sometimes placed to prevent herons from taking fish, but it is unsightly; may hinder dragonflies when egg-laying or emerging; and other wildlife may become entangled.

Your pond is bound to attract other wildlife, such as pond skaters, water boatmen, water beetles, snails, mayflies, caddis flies, non-biting midges, frogs, toads and newts. Birds love to use shallow edges for drinking or bathing, though some may learn to catch 'your' dragonflies! Ponds are also ideal places to photograph dragonflies.

Don't forget to record what dragonflies turn up and send your records to the Dragonfly Recording Network (further information and the contact details of your local Recorder can be found on the BDS website). Pond-dipping will show you what the larvae look like, but you should also be able to watch the astonishing dragonfly spectacles of emergence, mating and egg-laying.



Emperor resting on a hand © Elliott Lloyd (Flickr)

## EDUCATION

Ponds in schools, nature reserves and country parks have tremendous potential for raising the environmental awareness of both children and adults. In addition, dragonflies make excellent subjects about which to teach aspects of evolution, predation, entomology, pollution and climate change.

If a pond is to be used by the public, visitors need to be protected from potential hazards such as deep water and steep or slippery banks. If there is to be formal access for education then a fenced wooden platform at the edge should be considered for pond-dipping.



A raised pond at the dragonfly centre, Wicken Fen

# TO SUM UP...REMEMBER...

- Make your pond as big as possible, but not too deep.
- Establish a wide range of pondweeds and emergent plants.
- Once established, keep vegetation under control.
- Don't stock with fish or wildfowl.
- Enjoy your pond and its dragonflies!



## USEFUL REFERENCES

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5. British Dragonfly Society (for help with identification, recording and membership): [www.british-dragonflies.org.uk](http://www.british-dragonflies.org.uk)
6. British Trust for Conservation Volunteers (for on-line handbooks): <http://handbooks.btcv.org.uk>
7. Flora locale (for basic guidance on buying native flora): [www.floralocale.org](http://www.floralocale.org)
8. Freshwater Habitats Trust, <http://freshwaterhabitats.org.uk>



