Placing and constructing a garden pond

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Before building a garden pond

Before digging it is important to think about how the pond will fit into the rest of the garden. Some questions that should be asked are where will the water come from? How much sunlight will it receive? And how will wildlife get to it? On a purely practical level, always check whether there are any services beneath your proposed pond location. The last thing anyone wants is to dig into electricity cables or water pipes! These should be clearly denoted on the deeds to your home. You'll also want to consider how you will dispose of spoil, and this is considered later.

Where will the water come from?
For a pond to be healthy and full of life it needs a ready supply of clean water. Best of all will be pure rainwater, but almost as good is stored rainwater from water butts. Try to avoid a situation where multiple visits between water butt and pond are required in order to top or fill your pond up. If the most sensible place for your pond and your water butt are far apart, it might be possible to set up a hose line between the two, provided that there is a sufficient amount of downfall for water to flow.

In a particularly wet garden, digging a test hole no bigger than the size of a dinner plate and about 10 – 20cm deep might be sensible. Fill the test hole with water and leave overnight. If the hole is still full by morning (and it hasn't rained!) then there might not be any need to line the pond. Alternatively, lining a pond in this location may have its own problem if water begins to infill beneath the pond and push up the liner – this will cause big problems when using a pre-formed plastic or fibreglass pond liner.

How much sunlight will it receive?
The natural life of a pond is for it to gradually fill up over time with organic matter. How long this takes depends upon how much material enters the pond and its nutrient status i.e. more nutrients means more plant growth (see eutrophication). If a pond receives too much leaf litter from overhanging trees then it may suffer from oxygen depletion as decomposing bacteria use up oxygen and through this process, extra nutrients can be recycled back into the system. A shaded pond is also less likely to have an abundance of aquatic plant growth which require sunlight to photosynthesize. Some tree shade, however, can be beneficial by reducing the amount for water lost to evaporation. Leaf litter will also provide food, shelter and case building materials for animals such as cased caddis fly larvae.

In summary, try to place your pond where it will spend about half of the time in shade and half in sun. If you’re not able to avoid a heavily shaded pond then it should be kept shallow such that it is more likely to maintain good oxygen levels. If your pond is likely to receive a lot of sunlight, make some sections relatively deep such that it doesn't dry up entirely and look to maximise the amount of draw-down zone (see elsewhere).

How will wildlife get to it?
Pond life is well adapted to movement from pond to pond. As adults, many aquatic insects can fly considerable distances to find a new pond in which to lay eggs and some dragonflies

and water beetles may sample several to find one that is suitable. However, a lot of pond life does not fly and will have to negotiate many obstacles between them and a new breeding site. Urban areas are full of such obstacles as roads, fences, buildings and so on. To give frogs, toads and newts a chance of getting to a garden pond, make sure that there are gaps beneath fences. To further encourage them in, establish a good amount of cover from the entry points all the way to the pond which will provide protection from predators such as birds and cats. New ponds will get inhabited more quickly if neighbouring gardens or land also have ponds, so links between them should be enhanced as best as possible.

Pond form (importance of the drawdown zone)

Most pond life resides within the pond margins in little more than a few centimetres of water amongst aquatic vegetation, sand or gravel. Therefore, it is really important that new ponds have at least some of their margin dug at a shallow, gently sloping profile. Not only does this maximise an area called the 'drawdown' but it also ensures that amphibians can enter and exit the pond easily. Many conventional ornamental ponds have steep sides that don't allow frogs to leave the pond and have little to no drawdown zone.

The drawdown zone is the area over which the ponds water level fluctuates. A steep drawdown zone will have a small surface area in contact with the water as opposed to a gently sloping one. To provide the most habitat possible for pond life the profile within the drawdown zone should be gently sloping, dropping at a ratio between 5 and 10 to 1. The temptation to top up the pond during dry weather should generally be avoided as many aquatic organisms are well adapted to water level fluctuations. An added bonus to having a shallow margin is that the pond will be safer for people and terrestrial mammals such as hedgehog. Birds will also use the margins for cleaning.

Unless keeping fish, the deepest areas of a wildlife pond need not be any deeper than about 30cm to 50cm. This will keep the pond well oxygenated and well lit throughout, which is good for wildlife as well as wildlife viewing. Everything in between the deepest area of the pond and the drawdown margins should have varied depths and profiles - but not so much that the liner is unable to fit flush to the contours without complex folds and creases. Also, to put potted plants into the pond it will be necessary to have a few flat shelves to avoid the pot from constantly tipping over.

Pond construction

Once it is decided where your pond will be and how it will be formed all that remains is to construct it. You can build a pond at any time of year, but it is generally best to build it late autumn time when the ground is soft and there is plenty of time before next spring for it to fill up with lovely clean rainwater. Not only this, but it also means that the water collected in your pond and the ground around it will have had a chance to settle before planting up occurs. If the plan is to build it at other times of year, ensure that a sufficient amount of rainwater has been collected by other means first.

Garden wildlife pond construction has been covered in many other places around the web, so to avoid duplication, I won't go into too much depth here, however, see pages by the Freshwater Habitats Trust,Wildlife Trusts (and the Dragonfly Association for some excellent guidance. There will however, be some common issues that are likely to be encountered, which I will briefly touch upon.

Weather check

Generally speaking the following points apply to ponds that are being hand-dug or machine-dug, only if you are using machinery you need also to think about how the ground or weather conditions could affect its stability.

1. Don't start to dig a pond if it is wet or if it is forecast to rain at any point when you want to constructing your pond. It's just not worth the hassle!
2. Don't start to dig a pond in the height of summer. The ground is likely to be hard to work with and it's good to have a little moisture in the soil so it can be shaped.
3. Don't start to dig a pond in the depths of winter. As with summer, the ground is likely to be too hard, or it'll be too wet.
4. Notwithstanding 1 and 3, if you can dig your pond in early autumn avoiding later heavy rains, it can fill naturally after you have dug it.

Spoil disposal

Digging a pond generates a lot of soil. If you double the diameter of a pond you increase the weight of soil four-fold, and if the average depth double too, it’s an 8-fold increase. Big ponds are very hard work.

Even a small pond will probably generate more than expected because it is being moved from a compact to a loose state. With any luck, the spoil will be good quality topsoil that can be easily distributed elsewhere around the garden. On several projects I have used the spoil to create landscape features such as a bund where it is still in keeping with the landscape.

If you do want to use it to create landscape features, don't place these too close to the pond else there is a risk of nutrients being leached out into the pond. In any event, turf, plant or seed new landscape features to stabilise them and the nutrients they hold as soon as possible given the time of year.

In other circumstances I have ran some of the spoil through a sieve and then used it as a protective layer on the base of the pond before lining. If ultimately you don't have the space in your garden to redistribute the spoil then it may need to be disposed of off-site. If so, you must ensure that the appropriate permissions have been gained. If it's good quality, perhaps your neighbours would like some or if you have built a particularly large pond the local farmer may spread spoil over their land. Whatever happens, try to avoid any of the spoil finding its way back into the pond, particularly the nutrient rich soil from nearest the surface.

Level checking

As the pond is dug, always keep a check on where the water will overflow from the pond. This can be done easily by using the long, straight edge provided by a plank or pole in combination with a spirit level. Check bank to bank all the way around your pond to ensure that they are all level with the exception of an overflow (this may not always be required). This is very important to keep a close eye on so that you know which areas will be under water when the pond is full and where excess water will go during our wettest periods.

If you are building on land that is already sloping then the high side will have to be dug deeper and will have more exposed earth as a result, so think carefully about how soil

slippage will be avoided. Alternatively, it may be possible to use some of the spoil to build a bund on the low side and raise the bank level. This is a good way to redistribute spoil, but is quite an involved procedure bearing in mind that the built up area will come under considerable pressure when the pond fills up.

Choosing a pond liner

There is a wide variety of lining options for your pond, each with their own pro's and con's which is summed up in the table below. Generally speaking, however, the choice will often boil down to choosing between a preformed fibreglass pond or a lined pond. A fibreglass pond is undoubtedly the easiest option and some can be bought that provide gently sloping edges and a variety of levels, however, for greatest flexibility, a pond liner can be bought.

Method	Positives	Negatives	Expense
PVC (polyvinyl chloride) or polythene	• Cheap • Reasonably flexible	• Not as flexible as butyl rubber • Perishes in sunlight • Can puncture	£
Butyl rubber	• More flexible and much longer-lasting than polythene liner • More puncture resistant • Adaptable and good for shallow draw-down and extending to bog gardens.	• Perishes in sunlight (more slowly than polythene) • Heavy	£££
EDPM rubber	• As for butyl rubber but marginally cheaper • Less-shiny	• As for butyl rubber	££½
Pre-formed	• Easy to install • Hardy	• Inflexible • Don't usuallymaximise drawdown area • Unnatural looking	££½
Puddled clay	• Any shape	• Unlikely the right clay is present in your garden • For large ponds, likely to require experienced contractors • Liable to be silty and cloudy especially with fish or ducks.	Free (in theory) £££ in practice
Concrete	• Cheap • Strong	• Can crack under pressure or with soil movement. • Potentially toxic • Poor on sustainability • Hard to get shallow sloping margins • Hard to remove when the next person in your house takes it out.	£

Filling

It's always tempting to use the garden hose to fill a new pond with tap water to get instant results. For the reasons discussed elsewhere (higher nutrient levels lead to algal growth) it's best to avoid this. If you are really organised you could have stored large amounts of rain water in advance. If possible, time your pond creation for the autumn, so the normal increase of rainfall through the winter will fill the pond slowly and naturally.