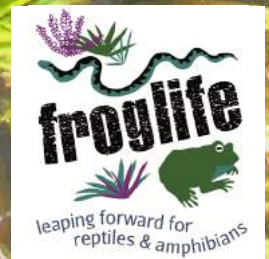


7th Edition

Just add water

How to build a wildlife pond



Froglife's work is underpinned and guided by Conservation Evidence. For more information please visit:

www.froglife.org/info-advice/just-add-water

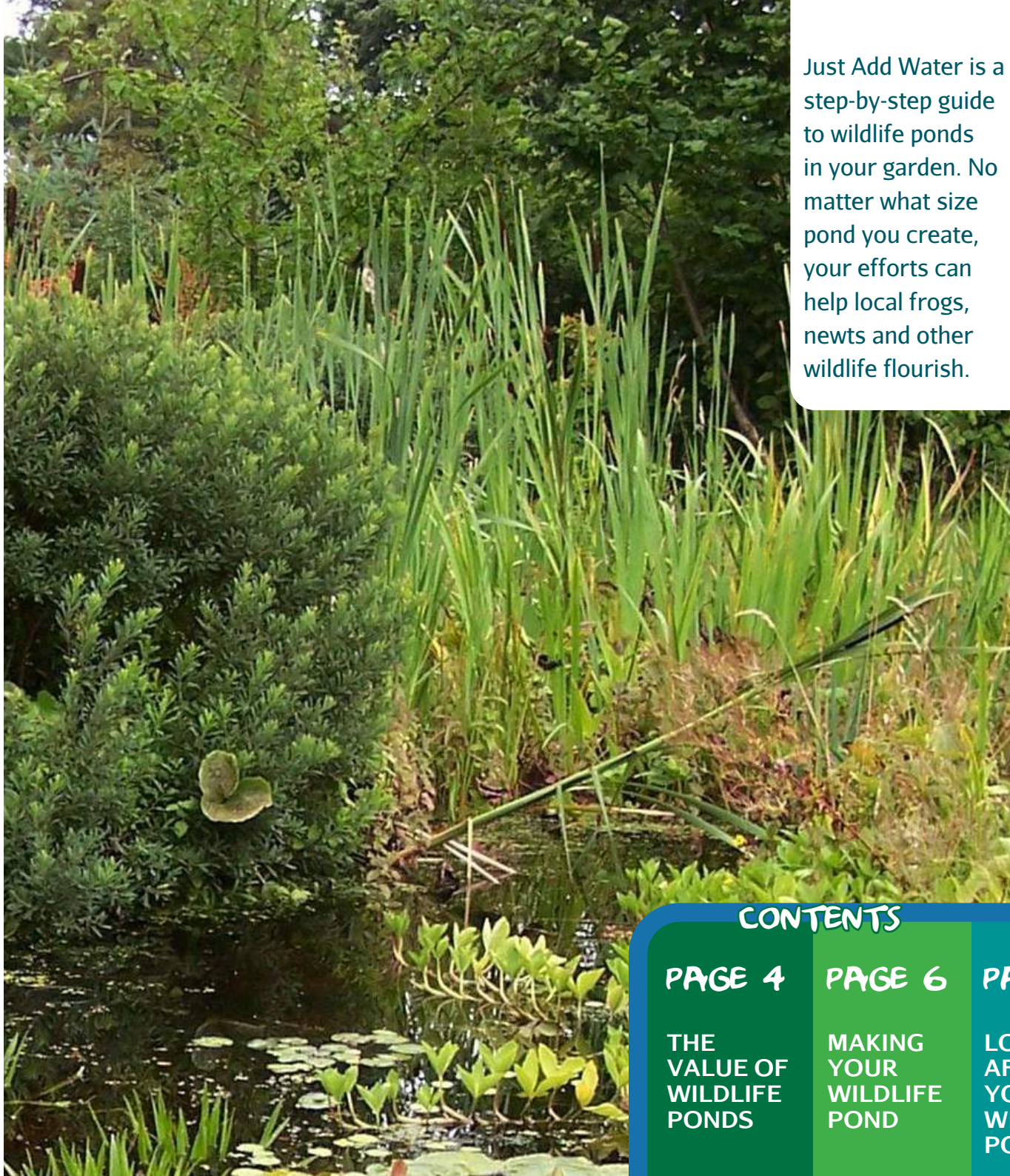
Cover image: Common Toad/Oliver Kratz

Froglife is a registered charity in England & Wales (no.1093372) and in Scotland (no. SC041854). Froglife is concerned with the protection and conservation of native amphibians and reptiles and the habitats they depend on.

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Photos: © Jules Howard/Froglife unless otherwise stated.
Illustrations: © Sam Taylor.



Just Add Water is a step-by-step guide to wildlife ponds in your garden. No matter what size pond you create, your efforts can help local frogs, newts and other wildlife flourish.

FOREWORD:

By Simon Barnes, author & journalist.



“Sun plus water equals life. That is the equation that governs almost everything that lives on this planet. We who live in a damp country celebrate the return of the sun every spring: those

who live in dry places long for wet and celebrate with joy when the rains come.

We can't bring the sun to our gardens. That is beyond our control. But we can bring water: and when we bring water we add immeasurably to life's possibilities. Water can be drunk, water can be lived in, water can bring in, like a trick of magic, animals and plants that simply weren't there before.

A pond is a small miracle, one that brings life to a place and joy to those all around. A new pond is a soft explosion of life. So here's what you can do after you've read this publication. You can light the green fuse, step back - and wonder at the forces you have unleashed.”

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THE VALUE OF WILDLIFE PONDS

In the wider countryside ponds are disappearing.

One third of ponds are thought to have disappeared in the last fifty years or so. This has had an enormous effect on wildlife, particularly amphibians. Frogs, toads and newts are dependent on ponds to breed; if ponds disappear, so do they. Yet, there is a solution.

Creating a wildlife pond helps wildlife locally. Big or small, adding water to your garden or backyard is a really good way to do your bit for the neighbourhood's wildlife. In addition, ponds can be fantastic places to spend time, relax and de-stress.

Greeme Skinner/Naturally Wild



WILDLIFE PONDS FOR EVERYONE!

Not sure if you have space for a wildlife pond? Think again. Any pond size is good for some form of wildlife: from a buried water-filled bucket, to a textbook wildlife pond (complete with pond-dipping platform and bird-hide). The point is, wildlife ponds can be for everyone, whether you have a backyard, allotment or garden.

Don't be put off by price either. Creating a pond can be as cheap or expensive as you want it to be. You can spend £5 or £500. Similarly you can spend two hours, two days or two weeks. Whatever you do, Just Add Water.

ANIMALS TO SPOT:



Frogs and toads return to ponds in early spring to lay their eggs. (Photo: Dawn Leppard)



There are three species of newt in the UK. The most common is the smooth newt.



The distinctive yellow and black collar of the grass snake makes it easy to identify. Grass snakes are excellent swimmers, so encounters are often fleeting.



A healthy pond will quickly colonise with various invertebrates, including pond snails, dragonfly larvae and water boatmen.



The pond may be visited by hungry birds like kingfishers and herons, or thirsty mammals like foxes and hedgehogs.

MAKING YOUR WILDLIFE POND

MATERIALS CHECKLIST:

BASICS

- Something for marking out the pond e.g. pegs & string
- Tape measure
- Spirit level
- Something to line your pond with (see right)
- Source of rain water
- Spade

- Wheel barrow

EXTRAS

- Rocks and pebbles
- Aquatic soil
- Baskets, bags or hessian squares to put plants in
- Marginal plants
- Oxygenating plants
- Floating-leaved plants

wildlife pond ideazone

Discover, inspire, then dig...



Get inspired to create your pond with our FREE Android app! Search for Froglife's 'Wildlife Pond Ideazone' on the Google Play Store



EIGHT STEPS TO POND HEAVEN:

6

STEP 1.
Mark out the shape

STEP 2.
Get digging

STEP 3.
Put in the underlay

STEP 4.
Put in the liner

STEP 5.
Start filling with water

STEP 6.
Tidy up the edges

STEP 7.
Plant up

STEP 8.
Maintain and enjoy!

Liners come pre-formed or cut-to-fit. Cut-to-fit liners allow you the freedom to make your wildlife pond your own shape, size and depth.

PRE-FORMED PONDS:

Many garden centres sell pre-formed ponds, usually made of plastic or fibreglass, largely designed for housing ornamental fish. These need to be carefully dug beforehand, but can last a long time (many over twenty years). The downside is that there is no room for creativity, and many pre-formed liner designs are exclusively fish-friendly, lacking slopes for other wildlife to get in and out.

Some people choose to make raised up garden ponds with troughs or raised pre-formed liners. Remember that many animals will find this much harder to get in and out of, so include some rocks or stones to help them.

LINER PONDS:

Lining a pond with a flexible material that can be cut to fit allows you to be more creative with shape and size. Many websites have special calculators to help you find out how much liner you need, or you can ask your supplier for advice.

UNDERLAY: The disadvantage of using these liners is that they can be prone to punctures, often from sharp stones, (plus the occasional claw or beak). Don't let this put you off though, just be sure to add an extra protective layer underneath - an old carpet or a layer of sand will form a protective barrier under your liner.

LINER TYPES:

Rubber: Rubber liners are flexible, strong and durable. There are lots of different grades available for different prices. It is available off the roll in some garden and pond centres or can be ordered online.

PVC: This is a lot cheaper than rubber, but is not as flexible or durable. It too can be purchased in stores or online.

Clay: A good quality liner but can be difficult to install and is more costly. However, if installed correctly this is the most natural option. There are different types available which require different techniques to be installed.

pond visitors

Water fleas (*Daphnia*)

MAKING YOUR WILDLIFE POND

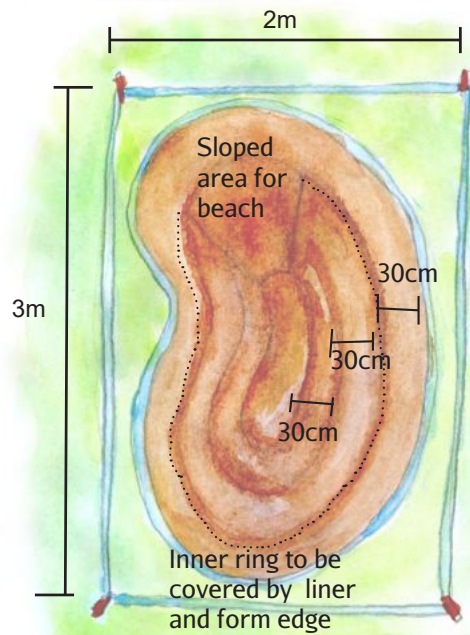
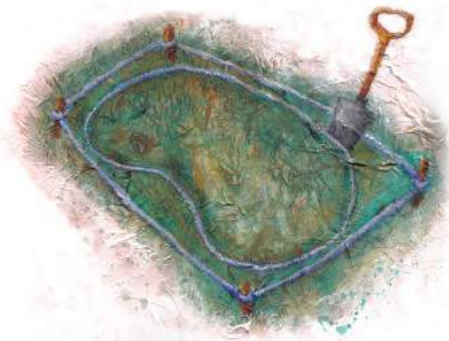
Any sized pond is beneficial to local wildlife, though amphibians will prefer ponds over 1-2 metres in diameter.

Where to put your pond: Your pond will need a lot of sun, especially in early spring. Frogs prefer warm and shallow water to lay spawn. A bit of shade is not a bad thing, but be wary not to put ponds underneath big trees: the falling leaves can clog up ponds in autumn.

Shape: Generally, it's a good idea to add some shape to your pond edges - don't go for straight sides, instead add some curves. This will help add to the number of microhabitats found in your pond, and makes it more attractive to wildlife. Many people go for the kidney-shaped pond style. Use a rope or hose to mark the pond edges before you start digging. Don't forget to add a sloping aspect to at least one end of the pond - this will ensure wildlife can get in and out.

Depth: A pond should ideally have a section at least 60cm deep to protect certain animals (like frogs) from weather extremes (particularly in winter).

Shelved areas: Shallow, shelved areas are good for basking invertebrates and tadpoles, and can be the most diverse and abundant area of a pond.



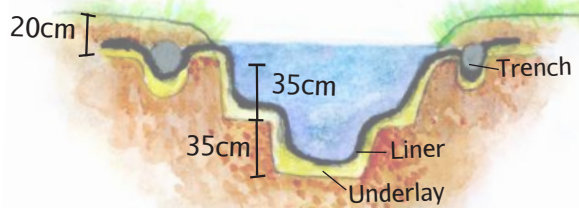
Levelling off your pond: When digging, ensure the edges of your pond are level. Use a spirit level, a flat length of wood or stringed pegs to level your pond.

Before laying your liner! Ensure you remove any sharp stones or pebbles. Add a layer of sand, geotextile or some old carpet between the soil and the new liner to lessen the likelihood of punctures.

Laying out the liner: The liner will stretch and move as it is filled with water, so it is a good idea to fill the pond at least part way before finishing the edges. As the pond fills you can fold and tuck excess liner to neaten it up, and cut off the edges to form a 30cm border around the pond.

Liner edges: When tackling the edges of your pond, dig a small trench around the pond into which the liner can sit firmly. Use small rocks to hold the liner in place. You can replant some turf cuttings from your earlier digging on top of the liner trench. This will hide the liner edges.

Filling the pond: Read on to learn how to 'Be wise about water' (page 10).



Use surplus soil to make an embankment near the pond. For more info see *Enhancing Your Wildlife Pond*, page 24.

MAKING YOUR WILDLIFE POND

BE WISE ABOUT WATER...

Water worries: Ponds can be filled with tap-water that has been treated first. Tap-water contains chlorine or chloramines, both of which are harmful to amphibians. Chlorine will naturally dissipate over time but chloramines need to be removed (inexpensive products are available). Topping ponds up during the summer is also generally fine, though be aware that extreme changes of water temperature can 'shock' animals if added in large amounts at once. Ideally, consider a water butt nearby or even run roof drainage directly into the pond. Don't be overly concerned about evaporation in hot weather - in most years the pond will top itself up naturally during the winter.

Chemical concerns: In some cases ponds may collect run-off during heavy rain. In most places this is not a problem, but be wary of nearby sources of pollution (e.g. garden fertilisers, crop run-off). 'Natural' and 'bio active' pond treatments are an option.

Filters and pumps: These aerate and clean the water, which is more of a necessity for those with ornamental fish. For wildlife, filters and pumps aren't necessarily useful: their 'vacuum' action can kill phytoplankton and zooplankton, which can affect animals further up the foodchain. Carefully chosen plants can be very effective in keeping your water clean (see Pond Plants, page 12).

Sam Taylor



You could recycle household items when making your wildlife pond.

- Here are some suggestions:
- Old bath
 - Butler sink
 - Half a wine barrel
 - Sunken plastic paddling pool

TUB-PONDS: PONDS FOR ANYWHERE

Ponds for wildlife don't necessarily need to be big. Smaller ones can still benefit amphibians as places to cool off in summer, plus many other animals can use them as a pit-stop.

Just remember that animals will need to get in (particularly frogs) and out of the pond (froglets!). Ensure at all times that there are sloping sides, using pebbles, log-piles and planted areas.

pond visitors



Water boatman
(Photo: Dorling Kindersley)

MAKING YOUR WILDLIFE POND

PLANNING FOR PLANTS

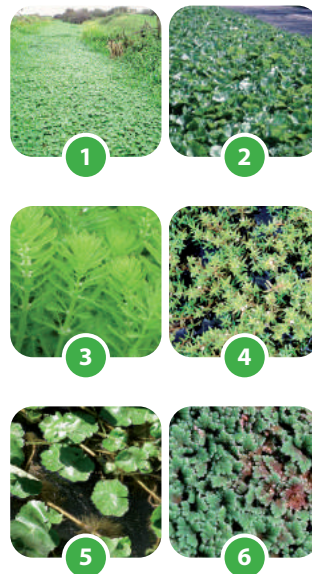
Once a pond has been created, plants will colonise it naturally over time. For a quicker outcome, you could get some cuttings from trusted local garden ponds (with permission).

Alternatively, you could plant-up your pond, making some careful choices. Avoid at all costs non-native plants, many of which could have a detrimental impact on local wildlife. The best practice is to keep it local and keep it native.

It can be tricky to locate suitable sources of native pond plants. Some garden centres are unclear about the origin of their plants. Do your research, use a specialised centre or consider buying online.

For more information about plants to avoid see Defra's Be Plant Wise campaign (<http://beplantwise.direct.gov.uk>).

Some non-native pond plants that should be left well alone: (1,2,5) Floating pennywort *Hydrocotyle ranunculoides*; (3) Parrot's feather *Myriophyllum aquaticum*; (4) New Zealand pygmyweed or water stonecrop *Crasulla helmsii* (often sold as *Tillaea recurva*); (6) Water fern *Azolla filiculoides*; Nutall's and Canadian pondweed *Elodea spp.*; Curly pondweed *Lagarosiphon major*; Water primrose *Ludwigia grandiflora*.



OTHER NATIVE PLANTS FOR GARDEN PONDS

Deeper water (submerged and oxygenating plants):
 Common water-crowfoot *Ranunculus aquatilis*
 Curled pondweed *Potamogeton crispus*
 Water-starwort *Callitriche spp.*
 Water-violet *Hottonia palustris*
 Willow moss *Fontinalis antipyretica*
Floating-leaved plants:
 Broad-leaved pondweed *Potamogeton natans*
 Fringed waterlily *Nymphaea peltata**
 Yellow waterlily *Nuphar lutea**

Marginal plants:
 Amphibious bistort *Persicaria amphibia*
 Brooklime
 Veronica beccabunga
 Creeping Jenny *Lysimachia nummularia*
 Lesser pond sedge *Carex aucuparia*
 Lesser spearwort *Ranunculus flammula*
 Marsh-marigold *Caltha palustris*
 Rushes *Juncus spp.*
 Water forget-me-not *Myosotis scorpioides*
 Water plantain *Alisma plantago-aquatica*

Yellow flag iris*
Iris pseudacorus

Gipsywort
Lycopus europaeus

Cuckoo flower
Cardamine pratensis

Water mint
Mentha aquatica

Bogbean*
Menyanthes trifoliata

Frogbit
Hydrocharis morsus-ranae

Soft rush
Juncus effusus

Purple loosestrife
Lythrum salicaria

Flowering-rush
Butomus umbellatus

Rigid hornwort
Ceratophyllum demersum

Common water-starwort
Callitriche stagnalis

Spiked water-milfoil
Myriophyllum spicatum

White waterlily*
Nymphaea alba

pond visitors

Ramshorn snail

*Can dominate so for large ponds only

MAKING YOUR WILDLIFE POND

FINISHING TOUCHES

PLANTING UP YOUR POND:

There are a number of options for putting plants into your pond. Many garden centres sell plastic planting baskets or bags to be filled with aquatic compost and pebbles. The bags tend to balance better on uneven surfaces or shelves. Another environmentally friendly option is to wrap roots and soil in a square of hessian sack and tie with natural string. Ensure soil has not been contaminated with pesticides or fertilisers. This can lead to algal blooms further down the line.

PLANTS FOR AMPHIBIANS:

Tadpoles will often be seen feeding on algae and decaying matter in the pond. On warm spring days you might see them congregate in shallower areas of the pond, particularly if there is an algae-covered rock on which to graze. For tadpoles and adult frogs, it's a good idea to have an area of tightly arranged plants at one end of the pond at least, to provide cover from predators.

You can help attract newts to ponds by growing pond plants on which they can lay their eggs. A wide range of plants with thin and easily folded leaves are used for egg-laying. These include Water forget-me-not *Myosotis scorpioides*, Water-mint *Mentha aquatica* and Marsh-marigold *Caltha palustris*.

FISH: WHAT'S THE BIG DEAL?

The best wildlife ponds generally have no fish in them. This is because fish can quickly dominate a pond, eating much of the other pond life and limiting the variety of wildlife in your pond. Their excretions can clog up the pond too, meaning the pond requires cleaning out more regularly.

Written consent and health checks are required from the Environment Agency to move any wild fish (or fish spawn) to inland waters in England and Wales. This is to minimise the chances of spreading disease.

ATTRACTING ANIMALS:

It is best to allow animals to arrive at your pond naturally. Amphibians often find their way to a pond within a year or two and some can travel over a kilometre or so to get to new ponds. Likewise many invertebrates like dragonflies, water boatmen and pond snails have surprising abilities to colonise.

TRANSFERRING ANIMALS:

Moving animals (or their spawn!) is generally to be avoided. Even if the pond you have in mind is a good quality, well-established pond there is still risk that you may accidentally introduce disease or undesirable animals or plant life (see Ponds and the Law, page 30).

STOP THE SWAP!

Froglife advise that you do not donate your frogspawn to other gardeners, or collect frogspawn to deposit in your own garden pond. The advice is given to help national efforts to stop the spread of invasive pond plants, animals and amphibian disease. In nearly all cases, amphibians will turn up of their own accord, often breeding in the first pond year.

pond visitors

Pond skater
(Photo: Dorling Kindersley)

LOOKING AFTER YOUR WILDLIFE POND

Like the wider countryside, ponds change with the seasons. They can go from an icy murky pool in winter to a colourful wildlife metropolis in summer. As a result, pond management is a seasonal job.

SPRING:

For many people, spring is all about the arrival of **frogspawn**, but there is far more than this going on. Each day there's new wildlife arriving or new buds sprouting. Spring is a fantastic time of year to use a torch to see what's going on after dark. Throughout the months of spring you could see female newts serenely laying their eggs on the leaves of submerged plants.

As far as jobs go, spring can see blooms in two particularly **fast-growing pondweeds**: blanket weed and duckweed.

If left unchecked, these can smother ponds and limit growth of other plants. To tackle these problem plants nothing beats hard work. Carefully run a net along the surface to scoop up **duckweed**, and twist a cane or stick amongst the **blanket weed** to pull this out. Always leave removed pondweeds to sit next to the pond for a day or two. This will allow animals accidentally scooped up to fall back into the pond. Don't leave pondweeds there for too long though, otherwise their nutrients will fall back into the pond. After a couple of days, add the pondweed to your compost heap.

SUMMER:

As **young frogs, toads and newts** make their first tentative steps onto land, summer ponds are full of all sorts of other emerging life. **Dragonfly and damselfly larvae** can be seen climbing out of ponds before turning into majestic flying adults. **Water boatmen** flourish and **pond snails** hatch out in droves to Hoover up the pond algae. Like spring, it's a great time of year for torching. Be wary of stone slabs near the pond at this time of year - in hot, sunny weather emerging amphibians can quickly dry out and die on hot paving slabs. You can stop this happening by covering these areas temporarily with a damp towel, or a moist lawn roll or by adding logs and plants to the edge of the pond (see page 26).

Problem plants can be a continuing issue in the summer months, and in many years some of the **pond plants** may need cutting back. Be mindful of causing too much havoc at this time of year - many invertebrates are particularly sensitive to disturbance.

When **cutting the lawn** or **strimming lawn edges** be especially careful of disturbing frogs, particularly young ones. **Long grass** is a favourite summer haunt and many injuries occur to amphibians by mowers and trimmers during this time. You can limit the damage by walking the garden length thoroughly before mowing. Most frogs will hop away once disturbed. Consider leaving parts of the lawn to grow wild and ensure mown areas are kept short throughout.

In some parts of the UK, you might come across lots of dead or dying frogs throughout the warmer months. If this is the case please contact Froglife and help our research on amphibian diseases (www.froglife.org/disease).

Summer is also a likely time to see **grass snakes** make hunting forays into gardens, particularly in areas where there are lots of amphibians. Grass snakes are the ultimate compliment to your wildlife gardening.

THERE'S NO SUCH THING AS TOO MUCH FROGSPAWN!

16

Frogs deliberately lay so much spawn because so little of it actually survives. If your pond looks very full, don't worry - things will naturally balance out.

pond visitors

Dragonfly larvae

LOOKING AFTER YOUR WILDLIFE POND

AUTUMN:

Ponds are quieter in autumn. Most animals have reproduced and moved on or died off. A few species have moved back into the pond ready to see out winter (like frogs). **Plants** have died back, leaving their seeds for the following year. If necessary, look at re-stocking native plants as this will help ensure there is plenty of oxygen in the water over the winter.

This is the best time of year to give the pond a **clear-out**, since the least number of species will be affected. Be wary of removing too much of the **silt** on the bottom of the pond - it contains **eggs**, **grubs** and other **insect larvae** (see page 20).

Falling leaves in large numbers could clog up ponds and cause a nutrient overload in autumn. This can lead to algal blooms in spring. Steer clear from using **pond-netting** though, sometimes the animals you're trying to attract (like **grass snakes** or hedgehogs) can become caught and die. The best solution is to try and get out there daily to take some of the leaves out with a net. Alternatively consider **cutting back nearby trees**. You could use the off-cuts to create a log pile (see page 26).

WINTER:

Ponds are largely silent in winter, with little plant growth and almost no movement from the depths. **Common frogs** are the only larger animal that might be visible. Male frogs lie dormant on the bottom of the pond and on sunnier days you might see them occasionally stir.

The biggest threat to pond animals in winter comes from ice. **Prolonged freezing** stops gases from moving in and out of the pond, leaving the water susceptible to a build-up of toxic gases and chemicals released as animal and plant matter continues to decompose. This can seriously damage the pond ecosystem, affecting a number of animals (not least frogs, which can die of so-called '**winterkill**'). To avoid this, remember to **clear fallen snow from the ice**, this means light will still be able to reach plants in the water so they can continue making oxygen. If you are able to, you could also **make holes in the ice** during frosty weather. Do this by leaving a **pan of hot water** on the ice surface to melt a circular hole. Alternatively leave a **ball floating** in the water the previous day, and remove this once the pond has iced over. Never use salt, antifreeze or chemicals. Don't be tempted to smash the ice either, the shock-waves can kill wildlife and ice shards could puncture the liner. It's important to remember that in severe winters, despite your best efforts, frog deaths are almost unavoidable.



Caddisfly larvae
(Photo: Dorling Kindersley)

POND NUTRIENTS AND BLOOMING PROBLEMS

Nutrients are plant food. They exist in the soils, float freely in the water and they are released when dead plants, leaves and animals decompose.

The presence of free nutrients in the water can lead to so-called 'algal blooms'. Being small and quick to reproduce, the algae (or phytoplankton) can replicate exponentially causing a murkiness or algal cloud (sometimes quite thick) to form in the water. Often what's lacking in these situations is an animal predator - a classic is the water flea (*Daphnia*), a species capable of reducing phytoplankton in a matter of days.

If your pond lacks water fleas then (with permission) consider asking a nearby garden pond owner for a small amount of silt and water, but be careful about transferring plants with it (see page 12). *Daphnia* can also be purchased.

Alternatively, to treat the immediate problem try barley straw or barley straw extract.

Both duckweed and blanket weed are indicators that the pond has a lot of free nutrients in the water. To tackle this consider adding larger pond plants - their growth will use up some of the free nutrients in the water and hinder growth of problem plants. If this doesn't work it might be worth considering cleaning the pond out the following autumn.

Nearly everything that goes on in your wildlife pond relates to the nutrients in the water.

POND RESTORATION: GET THE WELLIES...

Autumn is the time of year best suited to pond clearance, since many of the plants and animals are dying back and frogs are not yet returning to ponds to lie dormant through winter.

Bucket out the water, or use a pump if you have one, until there is only a small layer of water on the bottom, along with the pond silt. Carefully remove the uppermost layer of silt and put this in a bucket. This layer is where most invertebrate eggs and larvae are lying dormant, so this will need to go back into the pond once re-filled.

Put all pond plants into buckets while doing the work. Excess plant matter can be composted. You might also come across amphibians (particularly frogs in late autumn). If so, carefully place them in a bucket (remember air-holes) with lots of damp vegetation and release them back into a covered area (e.g. under a bush, a log-pile) next to the pond as soon as the work is finished.

Refilling the pond with tap-water is generally fine, though sensitive animals (e.g. overwintering dragonfly larvae) may need to be kept out of the pond until the water has been treated (see water worries page 10).

If you regularly remove dead leaves and vegetation from your pond then you might only need to clean out your pond once every five or ten years. However, most ponds will need some clearance at least every three or so years.



(Photo: wellies/Emma Scott)

Pond visitors

Tadpole (common frog)

LOOKING AFTER YOUR WILDLIFE POND

There are dangers associated with water, particularly for smaller children, but these can be overcome.

The educational benefit In recent years, there have been a handful of cases of young children drowning in garden ponds. The resulting media coverage of these events can lead to many worried parents wanting to fill-in existing ponds.

Where else locally can they learn about the seasons, life-cycles, wildlife communities and adaptation? Where else can they see tadpoles grow legs, colourful dragonflies lay eggs or hedgehogs quietly having a drink? Real-life experiences of this kind cannot be matched by TV.

Froglife believes that filling in ponds should always be a last resort, since the damage this can do to wildlife communities locally can be enormous.

Sadly though, the educational value of wildlife ponds can be overshadowed by some fears surrounding child deaths in garden ponds.



PLAYING SAFE

Wildlife ponds can be made safe if you have small children. Here's how...

Never leave young children unsupervised near any large container holding water. This includes large plant pots, tub-ponds, paddling pools and garden ponds.

Encourage children at every opportunity to respect water. This will benefit many children as they grow and could have wider positive impact. Many more drownings occur in water bodies other than ponds.

Put up a fence. Make sure it is at least 1.1 m high. The fence can be made of strong wood, unclimbable grating or with vertical railings no more than 100mm apart. Don't forget to leave a small gap between the ground and fence to allow animals access. A childproof, lockable gate is another option. Some people find willow-fencing more aesthetically pleasing.

Install a pond grille. Install a rigid mesh or grille across the pond to create a secure pond cover. The grille needs to be able to support the weight of a child and should remain above the surface of the water at all times. Garden centres stock grates and newer products are easy to install.

Gently sloping sides. These are important for wildlife, and for people too should they fall in.

It's worth stating that these can be temporary measures while children are smaller. Once children are older you can remove these features, promoting the pond as a place for enjoying and learning about the natural world.

www.creativepondcovers.co.uk



pond visitors



Smooth newt

ENHANCING YOUR WILDLIFE POND

Animals favour ponds for different reasons. Adult amphibians use them to lay their eggs. Grass snakes use them to search for frogs and tadpoles. Birds use them to drink and bathe. The best wildlife ponds and gardens cater for all of these needs by providing a rich variety of terrestrial habitats around the pond.

IDEAS TO GET YOU STARTED:

Damp areas: Emerging amphibians are very susceptible to drying out (desiccating) in the sun. Avoid dry features (like slabs and cobbles) that heat up quickly.

Grass piles: After mowing your lawn consider making a compost heap. Secluded sunny spots are best and wildlife visitors might include hedgehogs (to hibernate) and grass snakes (to lay eggs).

Toad homes: Build a toad home for your back garden (visit www.froglife.org/ resources). All you need is some basic DIY skills. With adult supervision, this can be an excellent exercise for children. When the shelter is complete, just put a few leaves and twigs inside and pop it in the garden.

Bog gardens: A bog garden is a marshy wet area that is invaluable for wildlife, and it's great for wetland plants too. Many amphibians use these areas to stay cool in summer and they are also attractive for a range of invertebrates.

Bog gardens are simple to make, just dig a hole to a depth of 30cm and lay a cheap rubber liner inside the hole. The removed soil can then be placed back on top of the liner. Pierce the liner with a garden fork to allow some drainage. You can choose to leave your bog garden bare and let plants colonise naturally, or alternatively you could consider planting some native marsh wild flowers. Make sure your bog garden stays damp by adding rainwater from a water butt. You could even consider putting your bog garden near a gutter outflow.

Amphibian wintering sites: For amphibians you could consider making a 'hibernaculum': an area where frogs, toads and newts can see out the winter. To do this lay down some old logs, brick-rubble or even hardcore, and cover this with excavated soil. Make sure your hibernaculum is in an area which is not in full sun, and that the soil drains well. Encourage moss and grass to grow on the top of stones and bricks by covering with a layer of soil or turf.



Amphibian hibernacula recipe: split logs, dead wood, rocks and bricks, loosely filled with topsoil (or turf/moss).



PLANTS FOR A BOGGY AREA:

Bugle *Ajuga reptans*
Marsh marigold *Caltha palustris*
Hard rush *Juncus inflexus*
Lady's smock *Cardamine pratensis*
Ragged robin *Lychnis flos-cuculi*
Purple loosestrife *Lythrum salicaria*
Marsh woundwort *Stachys palustris*

pond visitors



Common frog
(Photo: Darren Bealing)

ENHANCING YOUR WILDLIFE POND

1 Log piles & rockeries: Leaving logs and rocks around the edge of the pond helps emerging invertebrates and amphibians find shelter, particularly in winter. In addition dead wood attracts invertebrates on which amphibians can feed whilst they hide. Log piles can ensure many amphibians will stay in your garden all year round.

2 Lizard rockeries: South-facing rockeries might attract nearby common lizards, and other reptiles into gardens. Use the soil excavated after digging your pond.

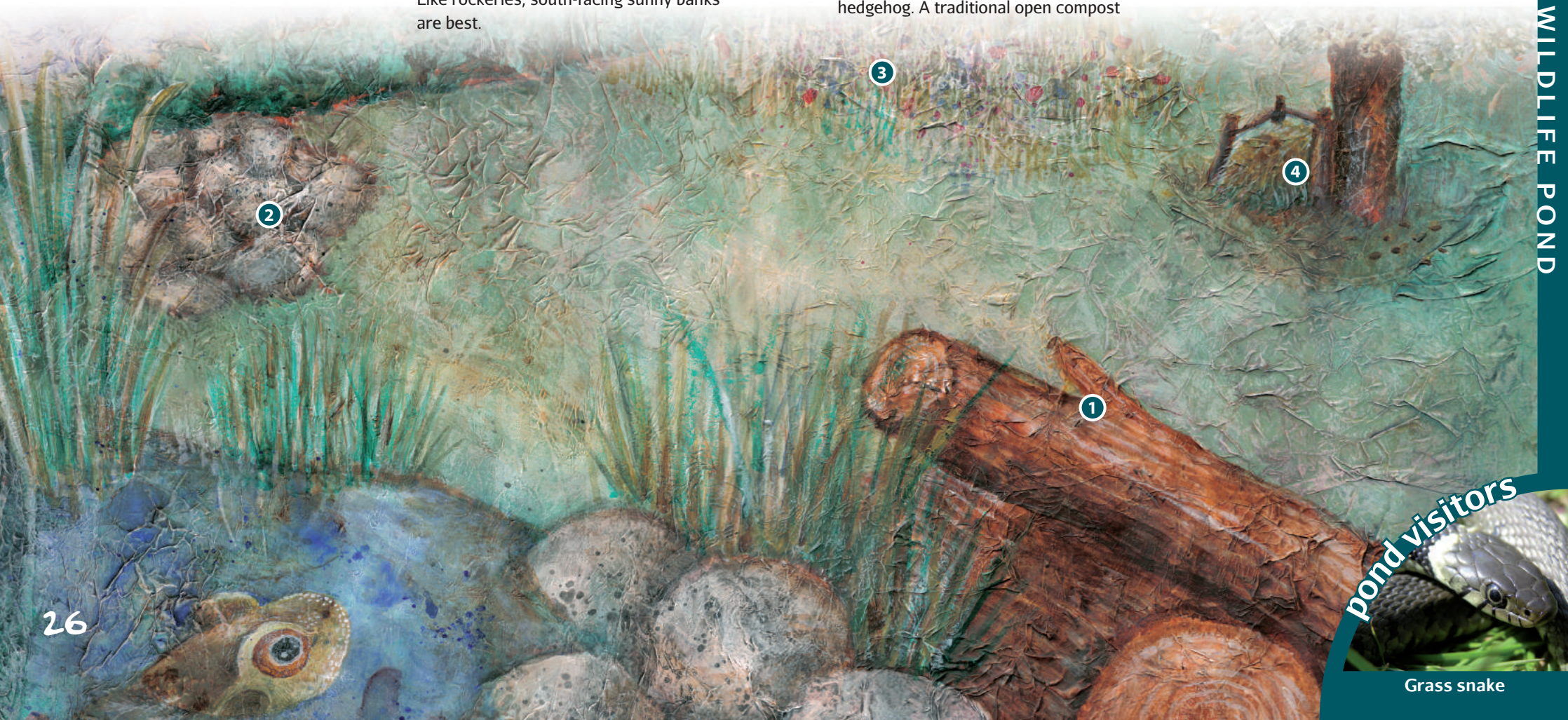
Butterfly banks: After creating your pond, consider using leftover soil to create an excellent wildflower bank for invertebrates like moths and butterflies. Sow the soil with native wildflower seeds. Like rockeries, south-facing sunny banks are best.

3 Grasses and wildflower areas: Depending on the size of your garden, think about a section/strip for wildflowers, herbs or even a hedge. This will create a more varied mosaic of wildlife habitats - butterflies and bees will particularly favour these areas.

4 Compost heaps: Any type of compost heap can be beneficial to wildlife even if it is enclosed. This is because a compost heap attracts lots of invertebrates such as slugs and snails - an ideal meal for any hungry frog or hedgehog. A traditional open compost

heap will produce a large amount of heat as the vegetation is rotting down, which will be especially favourable to slow worms, particularly if you lay some old carpet over the top. Grass snakes visit some compost heaps in the late spring to lay their eggs.

Whether you add these features for the benefit of wildlife or to complement your garden design, you might be surprised how much pleasure you can get from wildlife watching.



ENJOYING YOUR WILDLIFE POND



Not only will a pond benefit all the wildlife that will use it for breeding, drinking, hiding or bathing, it can also be a great source of enjoyment for people too!



HERE ARE SOME IDEAS TO HELP GET YOU GOING:

Pond-dipping: you can buy nets or pond-dip packs from many online shops or you can make your own using wire, a bamboo cane and netting. Carefully collect water in a plastic kitchen container (white is best). Put the net into the water and sweep it slowly backwards and forwards. Gently empty the contents into the container full of water and see what you have caught. Make sure you carefully return the animals to the pond soon afterwards.

Classify the creatures you find using a wildlife book or a Field Studies Guide (www.froglife.org/shop). Classic pond invertebrates to look out for include water boatmen, pond skaters, dragonfly nymphs and caddisfly larvae.

Sit and watch your pond, up-close or from a window, even for five minutes a day, to keep up to date with the latest visitors. How long before you see your first frog in the pond? When do the tadpoles start to grow legs? Keep a wildlife notebook - it might one day be useful for helping others learn about the changing climate.

Report your sightings: Could you become a Dragon Finder? A massive 41% of the World's amphibians and 21% of Europe's reptiles are at risk of extinction. You can help amphibians and reptiles in the UK by using this app to submit your sightings. With the app you can identify reptiles and amphibians, report a sighting and find out more about individual species. There is a wealth of wildlife to discover in the UK - whether you live in the countryside or

the city - so why not get out there and go in search of dragons!

Keep a pond diary: ponds change dramatically with the seasons, with new life turning up throughout. Consider keeping a diary of this transition. You could make a scrapbook (with photos) or even make your own blog, to inspire others about the magic of ponds.

Make a pond-hide: bird-hides are a really effective way of seeing birds up close. Why not add one near your pond? This is particularly effective if there's a bird-feeder hanging nearby. Patience is the key thing!

Get snap-happy: develop your patience and reactions by trying wildlife photography, capturing your garden wildlife visitors on film. There are a number of competitions you can enter if you get a good shot.

TELL US ABOUT YOUR NEW POND

We'd love to hear how you get on making a pond for wildlife in your garden! Send us your photos, let us know what turns up using the #JustAddWater on social media or email info@froglife.org

POND VISITORS



Grey heron
(Photo: Alex Draper)

ENJOYING YOUR WILDLIFE POND

Many wildlife conservation efforts in the UK are held together by valuable legislation. For ponds, these are outlined below.

PONDS, WILDLIFE AND THE LAW:

Moving plants and animals between ponds: You should always get permission from any pond-owner should you intend to transfer species between ponds. Movement of some species, if protected or considered damaging to native wildlife, is illegal under The Wildlife & Countryside Act 1981. Transferring fish and some amphibians may also require a licence or consent. Seek advice at every opportunity from the Environment Agency, Natural England, Natural Resources Wales or NatureScot.

Destroying ponds: If you know of a pond that is going to be filled in, and you have concerns about this process you could ask someone else with a pond whether they are willing to accept stock. If possible, movements should not be over one mile away. Animals should never be released onto a nature reserve or a public place without consent. Release of animals in an unauthorised place could make you liable for prosecution under the The Abandonment of Animals Act (1960).

Non-native animals and plants: The release of non-native animals into the wild in the UK is against the law. For pond species this includes red-eared terrapin and the North American bullfrog.

Laws relating to release of non-native plants are currently more lax. However, we urge the public to be extra vigilant and discourage the purchasing or movement of non-native or hybrid plant species. In the past, dumping excess pond vegetation in waterways has been common and very damaging.

FROGLIFE – WWW.FROGLIFE.ORG

Froglife works to protect, conserve and secure a future for amphibians and reptiles in the UK. We speak out for amphibians and reptiles, encouraging best-practice and inspiring new audiences to understand and appreciate the needs of our species. Our work addresses key threats to amphibian and reptile survival including: destruction and removal of habitats, non-native wildlife disease, invasive species and persecution. We also have a wide range of learning projects that involve people from all walks of life in our mission.

FIVE OTHER WAYS TO HELP AMPHIBIANS:

- 1. Become a Dragon Finder:** Spot amphibians and reptiles and let us know what you see. Your sightings can help national research on how the animals are faring. Our free app is available for download on Android and iPhone with a mobile website for other devices. Find I.D. information, hear frog and toad calls and submit your sightings through your mobile. **Download at: www.froglife.org**
- 2. Get Toad Patrolling:** Each spring thousands of toads migrate back to their ancestral breeding ponds. At many sites this will involve crossing busy roads. Froglife coordinate toad crossings at over 800 sites nationally, where volunteers help toads across roads while recording important information. **Take action locally: www.froglife.org/toadsonroads**
- 3. Become a Froglife Friend:** Help Froglife give a voice to amphibians and reptiles by becoming a Froglife Friend. Your support helps us conserve the UK's amphibians and reptiles and you receive publications and news on the latest research, projects and policies. **For more information turn overleaf & www.froglife.org**
- 4. Be a Citizen Scientist:** Froglife is part of the Garden Wildlife Health project in partnership with the Zoological Society of London (ZSL), the British Trust for Ornithology (BTO) and the Royal Society for the Protection of Birds (RSPB). If you find unhealthy or dead amphibians, reptiles, birds or hedgehogs in your garden, please let us know. **Find out more at: www.gardenwildlifehealth.org**
- 5. Make a Donation:** Every penny helps us continue our work protecting amphibians and reptiles. There are so many ways to help - you could fundraise for us, collect your small change, undertake a sponsored challenge or donate via www.froglife.org/support-us/donate. **Discover what you can do at: www.froglife.org**



Froglife is a UK wildlife charity committed to the conservation of amphibians and reptiles - working with people, enhancing lives together for a healthier planet.

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If you would like to become a Froglife Friend please fill in this form, detach and post it to: Froglife, Brightfield Business Hub, Bakewell Road, Orton Southgate, Peterborough, PE2 6XU

Name

Address

Postcode

Contact Tel.

Email

Level of Froglife Friendship:

£18 - annual single Friendship

£36 - annual joint or family Friendship

£500 Friend for Life

I am a UK taxpayer. Froglife (registered charity no. 1093372) can benefit from Gift Aid on my donation.

Signed Date

I would like to pay by: Cheque Card (see below)

Card No. (long number on front)

Start Date Expiry Date

Issue No. (if present) Security Code
(last three digits on reverse)

Name on card

Address (if different from above)

GET FROG FRIENDLY: BECOME A FROGLIFE FRIEND!

Join Froglife today and help us give a voice to the UK's amphibians and reptiles - saving species, improving habitats and enhancing lives in the process.

For as little as £18 for a year you receive regular newsletter updates, exclusive invites to Froglife events and special offers for Frogalogue merchandise.

THREE WAYS TO JOIN:

Online: www.froglife.org

By post: add your details to the left, including a cheque or your card details, detach and post it back to us

Give Froglife Friendship as a gift:
visit the online shop www.froglife.org/shop