Problem aquatic plants

What's the submerged water plant that's filling my pond?

There are around 90 species of submerged water plants in Britain – but only a handful commonly *fill* ponds (see table below). Some are native plants; but others like Canadian pondweed are aliens. Other underwater plants, such as water buttercups (*Ranunculus* species) and water starworts (*Callitriche* species), can also grow as large stands, but they don't commonly fill whole ponds.

You can check what these plants look like using a plant identification book or by searching their pictures on the web.

Many aquatic plant species are now becoming uncommon in the countryside, so it is worth finding out what you have.

If you are stumped – email us a photo to info@freshwaterhabitats.org.uk
You might have something special!

Common submerged water plants most likely to fill a whole pond

English name	Scientific name	Status	Notes
Rigid hornwort	Ceratophyllum demersum	Native	Often in ponds with sediment or which are shaded. A related species (soft hornwort) is more uncommon
Curled pondweed	*Potamogeton crispus*	Native	There are nearly 30 species of submerged *Potamogeton*s found in ponds in the UK, Apart from *Potamogeton crispus*, the most common are *P. pectinatus* and *P. pusillus*
Stonewort species	*Chara, Nitella* and *Tolypella* species		Over 30 stonewort species occur in the UK, Some are very uncommon. Usually they are a sign of good water quality
Spiked water milfoil	*Myriophyllum spicatum*	Native	There are three native milfoil species, spiked milfoil is the most common in England
Parrots feather	*Myriophyllum aquaticum*	Alien	This water milfoil has become an invasive alien in many ponds
Canadian pondweed and similar species	*Elodea canadensis, Elodea nuttallii, Lagarosiphon major*	Alien	All three of these alien pondweeds are now widespread
Australian Swamp Stonecrop/New Zealand Pigmyweed	*Crassula helmsii*	Alien	Usually found at the pond margin, but can completely fill ponds, and grow at more than two meters water depth

My pond is choked by waterweed – should I get rid of it?

Before you think about removing submerged plants it's worth considering a couple of questions:

- What will happen to the pond once you've removed them? If you clear-out large amounts of submerged plants, there is a considerable risk that the pond will become a permanent mud bath, an algal soup or will develop a cover of duckweed
- Why do you want to remove plants? Often they are very good wildlife habitats.

What's the risk?

You need to be careful removing submerged plants from ponds. Generally speaking, more are healthier than less.

> If you remove large areas of submerged plants from a pond there's a significant risk that your pond will flip permanently into a pea-soup state.

These days most ponds in the lowlands have too many nutrients (like nitrogen and phosphorus). These nutrients are used by submerged plants to grow, and if there are lots of nutrients, the plant growth can be rapid and luxuriant. There are three main types of pond plant that will grow quickly using nutrients from the water: (i) submerged water plants, (ii) algae and (iii) tiny surface-floating plants like duckweed.

If you have a pond chock full of submerged plants then remember it is *often a far better option than the alternatives*, which are much more unslightly and wildlife poor: usually either: (a) a 'pea soup' where the water is dominated by microscopic algae, or (b) extensive growth of filamentous algae (blanketweed), or (c) complete surface carpet of duckweeds (*Lemna* species) or alien plants like water fern (*Azolla* species). Alternatively, if the pond has lots of fish and no submerged plants, you can end up with just cloudy brown water.

If you are unhappy with large amounts of submerged plant growth in your pond, removing *some* is not likely to be a problem. It may even be beneficial because you also remove some nutrients locked up in the plants you take out. However, removing *large* areas of submerged plant cover is risky - your pond could flip over to the 'pea soup' or duckweed

state. And once there, it's extremely difficult to get back the clear water and any submerged plants. Unfortunately, you can't predict the exact point of no return when the flip will happen – so our general advice is:

Submerged plants are a pond owner's friend – they absorbnutrients and protect your pond from more significant problems - keep them growing in abundance.

Danger of removing aquatic plants

Standen Pond used to have dense underwater stands of the native submerged plant rigid hornwort. But it was catching in local fishermen's lines and causing them annoyance. Dragging out clumps of weed didn't work so the plants were sprayed with an aquatic herbicide. The submerged plants were successfully killed. But the pond then became turbid as fish stirred up the bottom sediments. The clear water and plants were replaced by an ugly brown soup. Fishing quality declined and everyone lost. The pond became an unattractive brown-water pond, with poor fishing, and poorer wildlife.

Wildlife benefits from submerged plants

These days most ponds are too polluted to have good stands of submerged water plants to grow, so if you have, you're already doing well.

If you have *native* submerged plants, that is even better as many native species are thought to be declining because of nutrient pollution. Ponds provide an important habitat for these plants, including many rarities.

Aquatic plants are also a valuable habitat for pond animals. Open water is a dangerous place for most pond animals. Aquatic plants not only give protection from predators, but they provide a rich foraging habitat: many animals (like pond snails, caddis flies and mayflies) graze the tiny algae growing on submerged plant leaves.

The term 'oxygenators' is often used for aquatic plants, but it is a bit of a red herring.
Submerged plants do produce an oxygen gain as a product of photosynthesis, but ponds are *still-water systems which naturally have low and variable oxygen*

levels - and their animal inhabitants are well adapted to this.

Some oxygen is still important, but the critical value of submerged plants is that they provide a vital *habitat* in what would otherwise be barren open water.

Canadian pondweed fills our village pond each summer, what should we do?

There are four plants that look alike and frequently pass for Canadian pondweed in Britain: Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), curly waterweed (*Lagarosiphon major*) and large flowered-waterweed (*Egeria densa*). All are invasive alien species which originated as garden pond and aquarium plants and have spread into countryside ponds.

Three of these four plants are now widely naturalised across Britain[1], and it is effectively impossible to prevent their further spread. Generally these aliens are unwelcome because they can out-compete and replace native plant species. BUT if they are already established in a pond, whether to remove them is a dilemma.

Although they have thuggish tendencies, Canadian pondweed and its allies also have the advantage: they can sometimes survive in ponds which are too polluted for our native plant species to tolerate. This means that these aliens can sometimes create a very useful habitat for animals in ponds that would otherwise be barren with no large stands of aquatic plants.

Once these plants are in a pond, it can be very difficult (and sometimes a mistake) to try and remove them.

There is no definitive right or wrong answer to the question of what to do about Canadian pondweed type plants, but on balance it's often easier and better to leave them be for the following reasons:

(a) When submerged plants are completely removed, the risk that the pond flips over to a pea-soup state is considerable

(b) They can be difficult to remove by mechanical means because they can grow back quickly, often thicker than before

(c) They can be a better habitat for pond animals if the alternative is no habitat at all.

Removing submerged plants

If you *do* want to remove alien submerged plants from your pond, there are three main options. Unfortunately none is ideal.

Mechanical removal

Removing submerged plants by hand or machine is most people's first choice.

Simple hand pulling is often used to remove small stands of plants. But in larger ponds and deeper water, a 'chrome' or muck rake (a specially shaped fork for pulling out water plants) is useful.

In deeper water, avoid working from a boat when removing water plants. Leaning over the side of boats to pull out plants is unsafe and shouldn't be attempted by the inexperienced. The best use for boats is to store water plants removed whilst you are wading!

If large quantities of submerged vegetation need to be removed, it can be quicker and easier to use mechanical means and employ a contractor to either dredge out or cut the plants. Contact a specialist plant removal contractor if this work is required.

However, note that physically removing alien aquatic plants is not always successful. Usually treatment will need to be regularly repeated to keep the plants back, although they may be weakened and eventually disappear, this can take a long time.

Canadian pondweed and similar (*Elodea*-type) species often respond *poorly* to physical removal. In fact, removing them can actively *promote* their growth, sometimes *at the expense of other submerged plants.* This is because these plants are winter-green, and can start to grow quickly, out competing native species before they can get going.

More positively, plants like floating pennywort (*Hydrocotlye ranunculoides*) *are* easy to knock-back by physical removal, and may be completely eliminated if the removal is repeated over a number of years.

[1] large flowered-waterweed. (*Egeria densa*) prefers warm water (its used as an aquarium plant) and is currently only localised in Britain.

FAQs: Problem aquatic plants

Very small patches (up to about 1m diameter) of Australian Swamp Stonecrop (*Crassula helmsii*) can sometimes also be successfully removed by hand – but considerable care is needed so that roots are removed and plant fragments are not released into the water during the process. Larger areas of plants are often best sprayed-out with herbicide (see additional guidance on this species).

Where invasive alien plants are physically removed they should be disposed of with care by composting, burning or removal in council garden waste bins.

Can fish and birds reduce plant abundance?

It is sometimes suggested that Chinese Grass Carp or pinioned waterfowl are used to control submerged plants. Although both will reduce the abundance of vegetation, their effects are unpredictable, difficult to control and potentially very destructive to other wildlife, so it's best to avoid them where possible.

Note also that it is illegal to introduce fish or non-pinioned wildfowl to ponds (except garden ponds) without appropriate legal consent.

Using herbicides and dyes

Appling herbicides or dyes can be an effective ways of controlling invasive submerged plants, although, in common with other methods, a number of applications may be required to control or eradicate the plants.

However, caution is required. As noted in a previous FAQ, if these products are used to completely remove all aquatic plants this can leave ponds in a much more undesirable state, with pea-green or brown cloudy water. Where used, they should usually also be applied early in the growing season, before the plants become super-abundant. If not, then when large areas of plants die and decay in the water this will de-oxygenate the pond.

There are also regulations to observe. From March 2010, it is no longer possible to buy plant pesticides for domestic use over the counter or on-line. However you can get similarly effective dye-based products from companies such as Dyofix. These dyes are applied to the whole pond, where they intercept light preventing submerged plant growth, killing some or all of the plants. The dyes then break down naturally in the water.

Dyes can be used on large water bodies too and, unlike pesticides, you don't need a licence to apply them. However, take care – because dyes successfully kill your "nuisance" plants – they could also kill other submerged plants in the pond.

For larger ponds, pesticides are still available for professional use. All aquatic herbicides need to be applied by a competent operator. And any user providing a commercial service is required to hold a NPTC (National Proficiency Tests Council) certificate of competence.

If pesticides are your favoured method for killing submerged plants, then written permission is also required from the Environment Agency in England and Wales (the Scottish Environment Protection Agency in Scotland, or the Department of the Environment for Northern Ireland). The appropriate forms can be downloaded from these agencies websites. The information supplied will need to include details of the site to be treated, who will be applying the herbicide, and which herbicides will be used.

New methods

New methods to control plants are continually being developed. Some of the latest trials are on geotextile mesh-type materials that are laid on the bottom of waterbodies, to prevent plants from growing through. Although probably not suitable for all aquatic plants, they may be successful at controlling species like Australian Swamp Stonecrop (*Crassula helmsii*) and Curly Water Thyme (*Lagarosiphon major*). We will update this sheet and provide more information as it becomes available.

The best guidance on removal methods for specific invasive aquatic plants is given by the Centre for Aquatic Plant Management.
Advice sheets are available for:
Canadian Pondweed
Nuttalls Pondweed
Curly Water Thyme

Should I leave the plants on the pond bank?

It is often said that plants removed from a pond should be left on the bank to give animals a chance to get back into the pond. This is laudable aim and some tougher animals that can move easily out of water, such as water beetles and greater water boatmen, may be able to get to a place of safety, or even fly away.

Other, slower-moving or more delicate, like water snails, mayflies and damselflies, are more-or-less doomed once out of the water and will almost inevitably die.

An alternative is to rinse the animals out of the plants by swishing vegetation about in the pond water as it is removed. In a small garden pond, plants can be washed-off in a bucket of water

Even then, all of these efforts may be more of a salve to our consciences rather than a real kindness to the animals. Management work to remove plants will inevitably eliminate their habitat, so they may not have much of a home to go to back to!

What's the best time of year to remove plants?

There is no *ideal* time of year to manage a pond. Different animals and plants have different rhythms of breeding, growing and dispersing, so the least damaging time for one species can be the most damaging for another.

So for example, late summer is likely to be a good time to manage if want to protect your water beetles and bugs, because adults removed from the pond can more easily fly away in warm weather,

Autumn management is often preferable for insects like damselflies, and amphibians like frogs and newts, since most young will have already emerged from the pond.

If you have fish, think twice about removing plants in warmer months when oxygen levels in the water will be lower. Plant removal can stir up bottom sediment, increasing de-oxygenation at a time when fish are already more susceptible to stress.