Problem pond plants –

managing algae, duckweed and other floating plants

THE PONDS CONSERVATION TRUST

Floating plants, like duckweed, blanket weed and the alien floating species Water Fern (*Azolla filiculoides*) can be particularly problematic in ponds.

Moderate amounts of filamentous algae ('blanket weed') and duckweed should not be a cause for concern however. Both occur naturally in ponds with good water quality and filamentous algae, in particular, often support large numbers of small animals. There are even tiny aquatic beetles which live out their lives within the duckweed fronds.

Graeme Skinner Naturally Wild Consultants Ltd

Floating leaved plants provide excellent cover for pond animals

Before doing anything drastic, also make sure which duckweed is present - there is a chance you might have Fat Duckweed (*Lemna gibba*) or Great Duckweed (*Spirodela polyrrhiza*) both of which are quite uncommon plants and worth protecting. If you live near the Somerset Levels or the south Kent coast you may see Rootless Duckweed (*Wolffia arrhiza*) - at 1 mm in diameter and looking like a green grain of sand, it's Britain's smallest flowering plant and one of the rarest!

Most people will, however, have Common Duckweed (*Lemna minor*), or increasingly perhaps the newer alien species, Least Duckweed (*Lemna minuta*), which looks very similar.

The problems with algae, duckweed and water fern really begin when these plants start to form thick surface mats across the water surface. To most people these mats look unsightly. Where the mats are thick they can also be treacherous because they may look like solid ground to children and animals. The surface cover can also cause problems for wildlife, both because it blocks out light to submerged aquatic plants and because it prevents exchange of gases with the air so that the underlying water can become de-oxygenated and noxious to aquatic animals.

What causes the problem?

The underlying cause of blooms of duckweed, algae and water fern is almost always too many nutrients (especially nitrate and phosphate) in the water. These floating-leaved plants are very tolerant of nutrients and where levels are high they can enjoy unrestricted growth.

New ponds or ponds that have recently been dredged often have temporary algal or duckweed blooms which persist for a few months. These occur because disturbance to the soil temporarily releases nutrients into the water. Such blooms are usually short-lived, and should cause little worry, since the system will settle down within a season or two.

Older ponds with a long-lived surface cover of plants are of more concern since they often indicate some form of persistent nutrient pollution. The causes are usually one or more of the following:

- fertiliser applied to fields or gardens which leaches into the pond;
- runoff from bare or disturbed soils;
- duck or livestock faeces;
- addition of food stocks, such as bread or corn to encourage ducks or feed fish;
- nutrients in the water supply (e.g. stream inflows or top-ups with tap water);
- sewage, silage or farmyard run-off;
- runoff from urban surfaces such as roads and pavements.

Anything that continually stirs up bottom sediments will also increase the release of nutrients from the pond's sediments into the water - this includes bottom-feeding fish and ducks.

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*Dense growths of Water Fern (*Azolla filiculoides*) are usually a sign of severe phosphate pollution.*

Managing algae and duckweed

Unfortunately, dealing with nuisance plants can be difficult - particularly at sites larger than garden pond size. The best option is to tackle the underlying problem of nutrient enrichment. Other methods are less satisfactory because they only deal with the symptoms. Increasing shade or adding barley straw can, for example, suppress algal growth (see below), but the 'treatment' will need to be continued indefinitely and neither are very effective at inhibiting duckweed.

Richard Snow

Broad leaved. Pondweed at Thames Water Pinkhill Meadow

Short term solutions

In the short term, with small ponds, blanket weed can be temporarily cleared using a rake or by twisting it on a stick. Duckweeds and Water Fern can be similarly scraped from the surface using a board or a sieve. This not only removes the plants but also takes out some of the nutrients that are locked-up in the plant tissues.

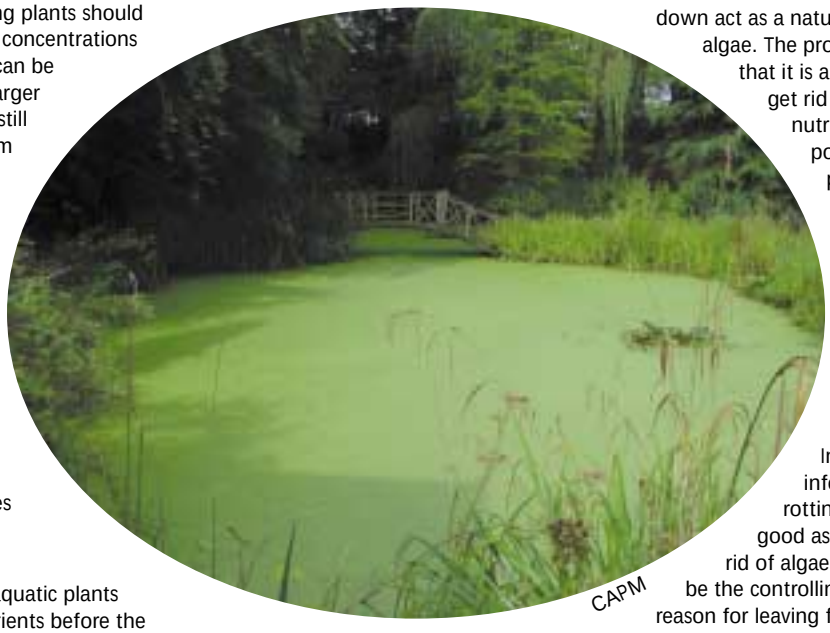
Regular removal of floating plants should gradually reduce nutrient concentrations in the pond. However, it can be soul-destroying work at larger sites and, if nutrients are still getting into the pond from other sources, it will not solve the problem.

Ensuring that there are extensive areas of wet organic soils and marsh plants around the pond edge can get rid of some nitrate in the pond. This is because these areas are excellent at transforming (denitrifying) nitrate into nitrogen and oxygen gases which can disperse to the atmosphere.

Maintaining *submerged* aquatic plants will help soak-up the nutrients before the nuisance plants can get hold of them. Beware though - most native submerged plant species will not grow in polluted water - so only think about adding them when other methods, such as dredging, have been used to clean up the water quality. Even then, submerged plants can be difficult to establish - so try small amounts first to see if they are likely to survive. When adding plant species to ponds, use only native species, ideally from a nearby source. Where possible avoid stock from garden centres since the origin of the plant material is not usually clear and, in some cases, the stock may be contaminated with fragments or seeds from invasive alien plant species.

Long term solutions

In the long term, the best solution is likely to be a combination of both (i) removing bottom sediments from the pond - since these store nutrients and supply them to the water column, and (ii) minimising the amounts of any further nutrients going into the pond (see previous page).



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Duckweed can cover a pond very quickly in nutrient rich conditions

Does barley straw help get rid of algae?

As a temporary solution, it is possible to try adding barley straw to get rid of algae. For garden ponds barley straw can now be bought from garden centres ready netted-up into small bags. The method works because chemicals released as the straw rots down act as a natural herbicide and kill the algae. The problem with this method is that it is a 'quick fix' - it doesn't get rid of the underlying nutrient problem - so the pond may continue to have problems in the long term. We have, for example, seen village ponds where barley straw was used successfully to get rid of algae - but the next year the pond was covered in a sheet of duckweed instead!

Interestingly, some new information shows that rotting tree bark may be as good as barley straw at getting rid of algae (tannins from bark may be the controlling chemical) - a good reason for leaving fallen branches in the water. Willow is particularly effective.

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Barley straw in nets being sunk below the surface of the water to assist control Algae

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