Silted up ponds

My pond's silted up and is drying out – is dredging a good idea?

There are many reasons for de-silting ponds: landscape, recreation, amenity, economic and wildlife conservation.

The following guidance provides advice for dredging ponds where the main aim is to **enhance the pond to protect its wildlife.**

Do you need to dredge?

The first question to ask if you are considering dredging a pond for wildlife is: **'how will dredging help wildlife?'** The second is **'might dredging cause damage to existing pond communities?'**

There are some good wildlife-based reasons for dredging ponds, but equally conservation dredging is often undertaken with the assumption that good will follow, when in reality this is unlikely.

Some good reasons to dredge wildlife ponds

- The pond is being managed for uncommon or declining species that need some deeper open water areas e.g. great crested newts.
- The pond is full of polluted sediments which are degrading the pond's water quality and wildlife potential.
- A new pond is filling up very rapidly with silts brought in by stream inflow.

Some bad reasons for dredging wildlife ponds

- The pond's been completely drying out in summer for a long time – so it needs deepening.
- The pond's only about 20 cm deep – wildlife needs deeper water.

Why shouldn't we dredge-out shallow and seasonal ponds?

Management guides often repeat the myth that wildlife ponds must have areas of deep water.

Survey results contradict this idea in two ways: first, they show that shallow ponds are as rich in species as deep ponds. Second, shallow and deep ponds support *different* community types. This means that each is of value in its own right.

Indeed shallow water areas in a pond will usually be *much* richer in wildlife than deeper water areas. Most species live near the edges in *very* shallow water - and particularly in areas less than 10 cm deep! So to improve ponds for wildlife an effective approach is to focus on these marginal areas, not deeper water.

Where possible, then, management should not always aim to deepen shallow ponds. The best way of maximising diversity is by having ponds of different depth within an area, some deep, some shallow.

If the aim is to combine the needs of wildlife and people's love of open water, then make sure that even if a pond is

deepened, large areas of shallow water are retained after the management work.

Pond myths
It's a myth that all ponds should include deep water if they are to be valuable wildlife habitats. In fact, deepening a shallow pond will just make it more like other deep ponds - and not a better pond for wildlife.

Ponds that dry out in drought years

One of the most significant myths of pond management is that drying out is always disastrous for pond wildlife, and management is vital to ensure that this never happens.

Perhaps the main reason for this myth is that it can be hard to believe how easily many pond plants and animals survive and even benefit from periods of drought.

Surprisingly, about half of all freshwater plants and animals are tolerant of periods of drought. And although some, like fish perish, many more benefit in future years – often because of the absence of fish!

Pond myths
It's a myth that: • Drying out is disastrous for ponds • Ponds should contain deep water (up to 2-3 m) if they are to be valuable for wildlife.

Temporary ponds

Temporary ponds are a particularly neglected type of ponds which are highly distinctive in that they **normally dry out every year.**

Although temporary ponds occur throughout the world, they have been all

but ignored in Britain. Only recently has work made it clear that temporary ponds are not only widespread in the British

countryside, but would once have been among the commonest of all freshwater habitat types.

Temporary ponds are particularly important because they have been shown to *support a wide range of specialised plants and animals - many of which are rare and declining.* This includes the Fairy Shrimp and the Tadpole Shrimp and Mud Snail, together with the Natterjack Toad and some very rare plants like Grass-poly and Adder's-tongue Spearwort.

Usually these shallow waterbodies go unnoticed or are assumed to be 'lost ponds'. They are also highly vulnerable to damage: their shallow depths and distinctive hydrology mean that they are very easily damaged by land drainage.

Temporary ponds also often look very uninteresting, especially during their dry phase, when they may appear to be no more than grassy or muddy hollows. This makes them a prime candidate for 'improvement' to make permanent water, but it is essential that special care is taken to ensure that they are adequately surveyed when there is a threat of management.

Our advice is **do not deepen long-lived temporary ponds to make then permanent without a proper ecological survey**. The risk is a real one: for example, in all of our recent national pond surveys, the rarest species have been found in temporary ponds. In most cases these were not in areas of known nature conservation interest and they had no statutory protection, being located in agricultural fields and secondary scrub woodland.

Should you dredge?

As noted above, the decision of whether or not to dredge a pond can be difficult.

In an ideal world you would always have full information about the pond's existing wildlife to help you decide on the wildlife benefits – then its much easier. You know if there are any rare or uncommon species which need protection and which plants or habitat types to leave un-dredged.

However, collecting good quality wildlife information from a pond needs professional-level expertise, which can be expensive. In very poor quality ponds, gathering such data, would be helpful, but in practice the likelihood of damage from dredging is low.

When to special take care

Ponds at particular risk from dredging are:

(i) ponds located in semi-natural landscapes

(ii) long established temporary ponds

(iii) distinctive pond types which are rare eliminated from the landscape

To help decide what to do, run through the following risk assessment:

Landscape-scale risk assessment

Are there many similar ponds of the same type in the area? – If not consider leaving the pond un-managed.

Ideally all the different types of pond in an area should be maintained to maximise the chances of keeping the widest range of pond plants and animal across a region. So keep shallow, seasonal and deep ponds, new ponds and silty ponds full of vegetation, grazed ponds and wooded ponds.

Pond risk assessment

is your pond likely to already contain rare plant and animal species which need to be protected?

- The pond is a murky black hole in an **arable** or **intensive urban area** with **few, if any, plants**.

If so the chances that the pond has a rich plant community or supports anything very special is quite low. With a pond like this, extensive dredging to remove (what are probably) polluted sediments is likely to be no-bad-thing, bank re-profiling, & possibly some tree removal, would often be helpful. Most important of all – reduce future pollutant inputs by buffering the pond (with unmanaged areas around it), blocking polluted inflow drains, or creating silt traps on inflows. This will help to improve pond quality in the long term.

- The pond is in an intensive land-use area or *semi*-intensive area (e.g. improved grassland) – **and the pond looks interesting** (e.g. has stands of wetland plants)?

If so, then be cautious and precautionary with management.

Retain a good area of all the plant species or habitat types that are present in the pond. If the pond has been a seasonal pond, drying every year, for many years (e.g. 10+ years), do not deepen it to make it permanent. If the pond is now marsh-land, you might consider digging small shallow pools within it rather than larger excavations. Consider ways of protecting the pond from pollutant inputs (as 1 above).

- The pond located in **any semi-natural habitat** (e.g. old woodland, heathland, unimproved grassland), and **ponds in or adjacent to long established wetland areas** like river valleys, fens, grazing marsh?

These are the most risky ponds with a high probability of supporting endangered or rare species – even if the pond looks uninteresting to our eyes.

In these high risk places we`d recommend getting survey information before any invasive management is undertaken. This includes clearing sediments or plants, changing the pond depth, especially if the pond is seasonal or modifying the banks.

As an alternative to dredging these high risk

ponds, you could also explore other options, such as creating a new pond.

Removing sediment from countryside ponds?

If you do decide to de-silt a pond, there are a number of options. However, removing sediment from large ponds is often expensive and can involve considerable preparation.

It may be worth considering that creating a new pond is usually much cheaper than dredging and, if you create the pond in a location where it receives clean water – this option may be better for wildlife!

Estimate volumes

Estimate the volumes of sediment to be dug out – this will help you estimate the area you need for disposal. Calculate volumes by measuring sediment depths at various points across the pond. In shallow ponds, up to 1 m deep, this can be done whilst wading. In deeper ponds, measure depths from a boat. Soft sediment can be treacherous, so **do not work alone** when measuring sediment depths. If the pond still has water in, remember that the excavated silt will be mixed with water: considerably increasing volumes and making the excavated material essentially muddy water.

Spoil disposal

Handling spoil it is often one of the most difficult part of dredging operations.

Solid spoil - the sort which can be dug out with a spade - is the easiest to deal with since it can be readily excavated and piled up. It is also relatively easy to move to another disposal site, though this may be expensive if you have to hire lorries or dumper trucks in the process.

If the pond still contains water, or the sediment is too soft to walk on, then the excavated spoil will be very liquid - and piling it up will not be possible. It will also be difficult to transport the material for dumping elsewhere. There are a number of options remaining under these circumstances.

i) **Spreading:** it is often possible to spread small amounts of the liquid slurry around a site. If there is sufficient space even quite large quantities can sometimes be disposed of in this way. Organic silt will rot down to almost nothing and grow over surprisingly quickly (usually within a year), but there are a number of provisos:

Do not dump silt on the pond banks - it will wash back in during the first heavy rain and all the work will be wasted.

Where possible avoid dumping it anywhere in the pond's surface water catchment area so that nutrients do not leach back into the pond through the subsoil.

Do not dump spoil on areas that have high quality vegetation or distinctively different habitats, including the pond banks or damp hollows near the pond

Sediments from urban ponds, which often contain a high proportion of litter including broken bottles and rusty cans, are obviously unsuitable for spreading.

ii) **Creating a lagoon:** If the area around the pond is not suitable for spreading, it may still be possible to create a temporary lagoon which will retain the liquid spoil until it has dried out. The dry sediment may then be moved to a final disposal site. Again, however, care needs to be taken to ensure that the lagoon is not created on important habitat types, and that the drainage is such that nutrient-rich water

will not leach back to the pond through the subsoil.

iii) **Draining the pond:** A final option is to drain the pond down, either by opening a sluice, or just pumping out the pond's water. This makes it easier to access, remove and dispose-of the bottom sediments. This is a very invasive method for de-silting ponds, since you remove both water and sediment. To our knowledge, no ecological assessments have been made to establish effects on pond wildlife, but they may be considerable.

If you are pumping water from a pond, check with the Environment Agency, SEPA or the Northern Ireland Environment Agency that this will not pollute adjacent watercourses.

Contaminated sediments: Some ponds may contain sediments that are so badly contaminated by dangerous chemicals that they must be treated as *controlled waste* and disposed of in special sites.

Ponds fed by water draining from old mine workings, former industrial sites or urban areas may have contaminated sediments. If there is any doubt, consult with the Environment Agency, SEPA or the Northern Ireland Environment Agency.

Safety and habitat protection

If machines are to be used for dredging, decide before hand with contractors, where it is safe for the machines to go in terms of both solid ground and habitats that can be disturbed. Mark out areas which are out of bounds to work parties or machines.

Timing

From a wildlife perspective, the best time to dredge a pond will depend on the species present in the pond (see our water levels & leaks information sheet). However, from a practical perspective, the easiest time is usually late summer or early autumn, when water levels are at their lowest and areas of more-solid bare mud may be exposed.

Dredging lined ponds

Dredging runs the risk of damaging ponds with liners. If necessary, check this first using old documentary evidence or by carefully digging a hole at the site (see Section 5.4). In practice, however, few ponds have linings unless they are located in regions with a chalk or limestone geology where lining was traditional.

Dredging small areas, or small ponds

Small ponds or parts of pond can be dredged by hand using chromes (long curved forks) for removing coarse material including leaves and rubbish. However fine material, and even semi-solid mud, cannot be effectively removed in this way.

For small-scale works, semi-solid silt can be removed with volunteer workers forming 'bucket chains', or 'spade and wheelbarrow' teams. But its hard work: if the typical bucketload is 5 litres, to remove 0.5 m of sediment from a small area 5 m x 5 m will require about 2500 bucket loads!

Dredging Larger ponds

For larger ponds sediment removal is best undertaken using hired machinery

Excavators

Excavators work best where the silt is solid or semi-solid and there is very little water in the pond. If possible, dredge when water levels are at their lowest, usually early autumn. A dumper truck will also probably be needed to move the silt to its final dumping site away from the pond. Excavators come with various arm

reaches (most are around 10 m), but specialist dredging contractors have machines with reaches of up to 18 m. This means that they can dredge out part of a pond 36 m wide if there is access to both banks. Ponds above this size may require a drag line.

For some ponds, having excavators on site may provide an opportunity to undertake margin re-profiling, such as lowering the height of some bank slopes so that there is more area within the drawdown zone.

Sludge pumps

An alternative method of dredging is to use a sludge pump which works like a giant vacuum cleaner, sucking up mud from the bottom. Sludge pumps come in a variety of sizes for different jobs.

Sludge pumps are a superficially attractive solution to the removal of sediment but are usually best undertaken by a specialist contractor.

Sludge pumping depends on the sediment being liquid so will need storage lagoons to receive the water and sediment to be pumped from the pond. Sediments cannot be legally discharged into neighbouring streams and ditches because of the inevitable pollution damage.

Floating excavators

Floating excavators can be used for de-silting large ponds, especially where there is very shallow water or deep mud. However this requires a specialist contractor and is likely to be expensive.

Bacteria and enzyme products

A range of bacteria and enzyme based products are advertised which claim to act on pond sediments, increasing decay rates so that silt depths are reduced. As far as we are aware, these products are not backed by independent scientific research. Our current view is that they would be a gamble to use.