POND ASSESSMENT AND SURVEY

Survey and assessment

There is a common belief that pond management is about ACTION: pulling out vegetation, dredging sediment and cutting back trees. In reality, good pond management is more considered. Often, the most crucial of all management tasks is to restrain everyone's natural enthusiasm to get stuck in and redirect it towards the more important but less dramatic process of surveying and understanding the pond.

Deciding on the best course of management (if any), is always enormously helped by an assessment of the plants, animals and history of the pond. It is hard to make good decisions about what to do at a site without some evaluation of its existing state. Too much pond management is still undertaken virtually blindfold – without any knowledge of whether the work is likely to help or cause damage to the existing wildlife.

This pond in Cheshire might look overgrown. In fact it's the perfect home of the rare and protected Lesser Silver Water Beetle (*Hydrochara caraboides*). Over zealous management of ponds such as this, would risk losing the species completely.

Getting to know your pond

Before considering pond management, first make sure that you've looked properly at your pond, and if possible take a look at other ponds in the area too.

Many people think that they know their own pond pretty well, but the trick is to look at the site from a plant or animal's eye view and consider how each different habitat might be used by wildlife. Read the 'What makes a good wildlife pond' information sheet to get an idea of the main pond habitats. Then look closely at the pond, considering in particular:

- The types of plant and animal habitats in the pond including bare ground, shaded areas and different underwater plant structures.
- The possible sources of pollution such as road drains, large numbers of ducks, run-off from arable fields
- How water levels vary during the year, and how this affects the plant habitat types.

Box 1. Is a survey really necessary?

Cases of damage done to ponds through ill-considered management are legion. Typical examples are:

- deepening temporary ponds to make them permanent, destroying the habitat of rare and specialised plants and animals
- dredging out ponds completely, destroying rich wildlife communities which have developed over many years
- cleaning out ponds which haven't been dredged for hundreds of years, losing their sediment record and archaeological artefacts
- replacing natural earth banks by concrete, thus destroying the most diverse wildlife habitat in the pond, the marginal vegetation
- managing ponds in winter, killing populations of Great Crested Newts and other animals hibernating in the banks
- clearing shaded ponds, destroying the habitats of specialist shade-tolerant species
- mending dams and destroying ancient wood and stone structures of unique archaeological value.

In all these cases, survey information to establish the existing value of the pond would have allowed knowledge-based management plans to have been drawn up, thereby avoiding problems.

When considering management options read the relevant management information sheets carefully and use them to develop a plan. There is rarely any need to rush into decision-making.

"look at the pond from a plant or animal's eye view and consider how each different habitat might be used by wildlife"

Remember that non-intervention may be the best policy. Or if you have the space, think about digging another pond. Sometimes just tinkering is a good option. **At public sites, for example, strategically removing a tree or some vegetation that is blocking a public viewing area can drastically improve the look of a pond with no concerns about damaging biodiversity.**

Do you need to survey a pond before you manage it?

If you have ecological survey information from a pond, management decisions are easier. So for example, if you know that a pond has *little* existing wildlife interest – you can confidently make very drastic management changes: maybe completely de-silting the pond or clear-felling all surrounding trees. If on the other hand the pond supports rare species you can manage areas of the pond so that it won't be affected, or do work that will specifically enhance its population.

A basic level of survey information that will help to inform management decisions is outlined in Box 2.An example of what sort of information and help ecological assessment will give is described in Box 3.

Box 2 Ecological surveys

Some areas of pond survey work require special knowledge. Given a little perseverance, quite a lot can be achieved even if you don't have much previous experience. You may also have local experts to provide a hand. Professional surveys are likely to be needed for more difficult species like aquatic invertebrates.

Site hydrology: Work out the pond's hydrology from field observation and geological survey maps (see the Pollution factsheet for methods).

Amphibians: The main aim is to find which species are present and very roughly assess their numbers. Surveys need to be undertaken in Spring. Methods and recording sheets are available on the Freshwater Habitats Trust website. Note that if the pond is known to support Great Crested Newts - they and their habitats are specially protected and you need a licence to survey them.

Dragonflies: List the species seen on the wing during the course of the year with the aid of a good field guide. Ideally, look out for larvae and exuvia which indicate breeding success. Survey methods and recording sheets are available on the Freshwater Habitats Trust website

Wetland plants. Botanists can get a checklist of British wetland plants and survey methodology from Freshwater Habitats Trust website. Surveys are undertaken in summer and, because many aquatic species are difficult to identify, some previous experience is recommended.

Pond invertebrates. Amateur or professional biologists who can identify pond invertebrates to species level are recommended to undertake a standard National Pond Survey (NPS) invertebrate survey, which will take approximately two days with most time spent in the laboratory sorting the sample and identifying specimens. Survey methods are available on the Freshwater Habitats Trust website

Ponds in semi-natural areas need particularly careful assessment. Surveys of Diptera (flies) should be considered, and also mosses if the pond is in woodland.

No survey data? risk-assess your pond

Ideally, all ponds should be surveyed before they are physically managed. However gathering information about a pond's inhabitants is daunting to many, and can be expensive if done professionally.

Our survey data shows that some ponds are far more at risk from management damage than others, so we have developed a risk assessment which can be used to identify which ponds are most likely to be safe to manage without survey information, and which ponds are at far greater risk. This method is outlined in Box 4 and discussed below. Note that, of course, there will be gradations between the risk categories.

Stage 1. Landscape risk assessment

First, think about your pond at the landscape scale. Are there lots of similar-looking ponds in the area, or is yours very different to the others? If it's the latter, then be careful……

The plants and animals that live in ponds can be very varied depending on factors such as whether the pond has permanent or seasonal water, is full of plants or bare, in woodland or meadow etc.

Our studies have shown that around one in five species only occurs in a single pond within an area. So if we lose that species from a site through poor management, it will be gone from the area completely.

The simplest way to minimise this risk is to ensure that many different ponds types are maintained in the landscape. In other words it's important to retain a number of examples of shaded, seasonal and well-vegetated ponds in any area, and not manage all ponds to be the same – vive la difference!

Stage 2. Rare species risk assessment

One of the main worries with any form of management is that, maybe, some exceptionally rare species is lurking unknown in the pond that could be harmed.

A partial quick step towards evaluating this risk is to check Freshwater Habitats Trust's Priority Species Map'. This is an online mapping tool that allows you to find which pond-associated Priority species have been recorded in your area. The tool only includes Priority species (i.e. plants and animals currently singled out by government for special protection), and not the many hundreds of other Red Data Book or Nationally Scarce species living in ponds. However, it is still a valuable start.

If the map tool *does* show that Priority species occurs near to your pond, then research the species habitat needs (some habitat information is available from the map tool), and check to see whether or not that Priority species is found at *your particular pond* using an online search of the National Biodiversity Network (NBN) website. If you find that site records are restricted access, then contact the *data source providers* that are listed by the NBN. If Priority species *are* found at *your*

pond, then contact species experts for advice. The data provider identified by the NBN may help you directly, or will refer you on to an expert.

Even if a Priority species present in the area has not been found at your *specific* pond, then it is still wise to proceed with thought and caution: perhaps the species *is* in your pond, but just hasn't been recorded there. Or maybe you could manage your pond to encourage the species to spread there. To find out, research the species' habitat needs and contact specialist experts as necessary. Finally, and importantly, note that *if the Priority species recorded from your pond is legally protected* then there will be legal steps that you need to take before the pond can be surveyed or managed.

Which species are legally protected?

A small number of Priority plants and animals are protected by UK law, as a result of either European or National legislation.

European Protected Species listed on the Habitats Directive receive the most stringent protection. Under the Conservation of Habitats and Species Regulations 2010, it is an offence to capture, kill or disturb; deliberately to take or destroy the eggs; or to damage or destroy a breeding site or resting place of a

European Protected Species. Pond-associated species protected under this legislation include: Otter, Great Crested Newt, Natterjack Toad, Creeping Marshwort, Floating Water-plantain and Fen Orchid. All bat species are also included in the legislation, which is relevant to ponds because small waterbodies can provide an important food and drinking resource for bats.

Some additional species are also protected under the Wildlife and Countryside Act 1981 (as amended). Thus under Schedule 5 it is an offence to intentionally or recklessly kill, injure or take any of the following pond-associated animals: Norfolk Hawker, Fairy Shrimp, Southern Damselfly, Fen Raft Spider, Spangled Water Beetle, Lesser Silver Water Beetle, Medicinal Leech and Water Vole. There is also specific detailed guidance for Great Crested Newts.

Under Schedule 8 of the Wildlife & Countryside Act It is an offence for any person to destroy, uproot or pick the following plants: Brown Galingale, Creeping Marshwort, Grass-poly, Pennyroyal, Petalwort, Fen Violet, Starfruit, Ribbon-leaved Water-plantain, Bearded Stonewort, Strapwort, Cut-grass.

If any of these protected species *are* recorded from *your* pond, then licensing is likely to be needed to manage, or even survey the pond. Guidance and forms are available from Natural England, the Welsh Government, Northern Ireland Environment Agency and Scottish National Heritage.

Box 3. Surveying a pond – what happens when the ecologists come in?

It can be a bit of a mystery. The ecologists arrive, unload pond nets, buckets, grapnels and fieldsheets, net the water, and peer at the plants; then they disappear with buckets of pond debris. But how can it help you to decide how to manage a pond? Here is an example of a pond survey undertaken by Freshwater Habitats Trust to help a local community group.

The Dell, Cardiff

The Dell is a pond which lies in a shallow quarry in an urban park in the northern suburbs of Cardiff. The pond is about 25m x 25m in area and has a central zone of open water fringed by tall vegetation which was rapidly spreading to the middle; litter was also a problem. The community group, believing that little of any value lived in the pond, planned to clear litter, remove some of the tall vegetation and to enlarge the pond's permanent water area by extending it into a wet grassland area at the back of the pond.

An ecological survey showed that the pond was already very rich, with good populations of frogs, toads and newts, a highly diverse mosaic of wetland plants and many aquatic invertebrate species.

To make sure, the number of plants and animal species found at the pond was compared with a *national* data set of ponds to see how it shaped up. The results confirmed that the pond was 'exceptionally biodiverse'.

The survey showed that one of the most important habitats in the pond was a group of small pools in the wet grassy drawdown zone. Critically, this area would have been destroyed if the community group plans to extend the pond had gone ahead.

After discussion of the results with a representative of the group, a number of recommendations for the pond were drawn up. These included:

- Habitat creation to make some new pools in the drawdown zone for uncommon water beetles found in this area. These were made simply by taking off the grassy turf, removing a few spadefuls of soil and replacing the turf again to give tiny shallow grassy pools.
- Regular litter picking to keep the site looking its best.
- Strategic removal of tall vegetation to improve views of open water. Instead of removing vegetation from deep water it was recommended to remove wedges of vegetation along sight lines from the main viewpoints around the pond (e.g. seats) so that the existing open water could be seen better.

A meeting was held on-site with the group's co-ordinator to discuss the recommendations and agree ways forward.

Stage 3. Pond-level risk assessment

Freshwater Habitats Trust's data show that the most important predictor of a pond's wildlife value is its surroundings. Ponds that surrounded by intensive arable land, and have few plants for example *rarely* support high value pond communities and will usually benefit from management to improve their water quality and conservation value. In contrast, around 1 in 4 ponds in semi-natural landscapes like heathland and native woodland support rare species. There is also a special risk amongst ponds located *near to ancient wetlands* such as coastal grazing marshes and floodplains. In such cases, undertaking physical management without survey information is risky.

Ponds at Low Risk from management

The lowest risk ponds are those located in areas of intensive land use and which have virtually no wetland plants in or around the pond. This includes, for example, over-shaded ponds in arable fields, or polluted ponds draining farm buildings. These ponds typically have high levels of pollutants in their water and sediment, and support few species. In these cases there is a relatively low risk that they would support uncommon plants and animals. Drastic management can often be beneficial for these ponds, especially if it includes dredging out polluted sediments and buffering the pond to reduce future pollutant inputs. Removing overhanging shade may also be beneficial if it allows marginal plants to grow. There appear to be few uncommon shade-loving plants or animals that can also tolerate pollution.

Low risk pond

Bare ponds in **intensive farmland or urban areas**, rarely support uncommon plants and animals, and are most likely to benefit from management to dredge out what are often polluted sediments, remove shading trees or create buffer zones that will protect them from further pollution

Ponds at Medium Risk from management

Medium risk ponds are sites that are either located in moderately intensively managed landscapes (e.g. improved pasture), or in intensively managed landscapes BUT which have good stands of emergent or aquatic plants. These ponds usually turn out to be pretty "average" in terms of their biodiversity – but they can still support a wide range of wetland species in the countryside. Some have declining species such as Common Toad or the protected Great Crested Newt. A few turn out to be exceptional. For example, temporary ponds in Kent farmland with the very rare Fox Sedge (*Carex vulpina*) and ponds in intensive grassland but close to the Somerset Levels with populations of the protected Lesser Silver Water Beetle (*Hydrochara caraboides*). Ponds are particularly likely to have rare species if they occur in or near to large "wetland" areas. This includes ponds on river floodplains, or the valley slopes above, ponds on coastal plains, and ponds in areas, such as Cheshire or Norfolk, with a high density of ponds.

Medium risk pond

Ponds in intensive farmland or urban areas that have good plant stands may already have valuable wildlife communities – some do, some don't! Without a survey to guide management the safest thing is to manage these ponds using precautionary principles

Medium risk ponds are the most difficult ponds to assess with confidence. So we recommend that if a survey is not possible, these ponds should be managed using **precautionary principles** (see over-page)

Ponds at High Risk from management

Our data shows us that the *riskiest* ponds to manage without good survey information are those located in semi-natural areas such as woodland, scrub, heathland, marshland and unimproved grasslands. Many of these sites (at least 1 in 4) already have nationally rare species, including Red Data Book and Priority species.

Because of the potential for high risk ponds to be unknowingly damaged by management we recommend that these ponds are not managed without first obtaining survey data describing their plant and animal communities.

Note that valuable ponds in semi-natural areas don't always look that great! Dark leafy depressions, summer-dry hollows, and even damp track ruts *do* support valuable species, even though this seems unlikely at first sight. It is still possible that management of these sites would be beneficial – but a survey is necessary to check that the baby would not be thrown out with the bathwater!

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High risk ponds

Ponds located in semi-natural areas such as woodlands, marshland, heathland and unimproved grasslands are likely to support rare plant or animal species. So there is a high risk they could be unknowingly damaged by management.

Valuable ponds in semi-natural areas don't always look great but can still be really important!

Dark leafy depressions, summer-dry hollows, and even damp track ruts *do* support valuable species, even though this seems unlikely at first sight. Management might still be appropriate – but a survey is necessary to check that the work would not throw the baby out with the bathwater!

Managing ponds using precautionary principles

If ponds are at **medium** risk of damage from management, and there is no survey information to guide management, then the best approach is to manage with caution in a minimally-invasive way that will reduce any potential harm.

The main priority is not to fundamentally change the pond and to retain a "good" proportion of all of the all the different existing habitat types.

For example:

- Don't deepen seasonal ponds (which dry out in summer) to make permanent water.
- Don't drain the pond.
- Don't destroy any habitat type completely – including less appealing areas such as muddy edges.
- Don't remove more than a quarter of the pond's sediment over a 3 year period.
- Don't remove more than a quarter of the vegetation as a whole, or of an individual plant species, in a 3 year period.
- Don't cut down more than a quarter of trees in and around the pond over a 3 year period.
- Don't link ponds to drains or streams.
- Don't steepen the water's edge profile or reduce areas of the drawdown zone.
- Don't allow the pond's surface water catchment area to become more intensive (e.g. buildings, roads, arable land).

Box 4. Pond management risk assessment