

## Ponds for Wildlife - Creation and Restoration

### SUMMARY

- **Ponds are important for a wide variety of wildlife from frogs and toads to dragonflies and damselflies.**
- **They are frequently threatened by drainage, mismanagement and development pressure.**
- **Ponds require unpolluted water. Their wildlife value is increased if in association with other wetland habitats.**
- **The profile should be gently shelving to allow for marginal plants to grow around the edge, to provide shelter and food for wildlife**
- **In a small pond the shallows should be 10 – 25cm in depth and occupy up to two thirds of the pond area, with a couple of deeper pools between 50cm and 75cm deep.**
- **A variety of natural materials could be used around the edge to provide a range of habitat types e.g. rocks or a woodpile as shelter for amphibians.**
- **When restoring a pond, survey first to find out the wildlife value of what you have.**
- **Always avoid drastic management changes to the pond. In particular do not change more than about 25% of the existing site.**
- **If in doubt, leave the pond alone. Create a new pond rather than managing an existing one.**
- **Allow natural colonisation; avoid planting countryside ponds with garden centre stock.**
- **Don't try to make long established temporary ponds permanent. Open water is not always necessary and wetland areas that are flooded in the winter can be equally important.**
- **You should consult SEPA and your local Council planning department for guidance on legislation and planning.**

## Introduction

The definition of a pond used here is a “Man-made or natural body of freshwater between 1m<sup>2</sup> and 2 hectares in area, which holds water for all or part of the year”. This technical note provides guidance on good practice in the creation and restoration of ponds in Scotland.



Photo: C Hall

## Status of Ponds in the UK

The wildlife value of ponds in supporting rare species is underlined by the number of freshwater UK BAP species that are found in permanent and temporary ponds. In Scotland, these include amphibians; great crested newt and natterjack toad, plants; pillwort, slender naiad and marsh clubmoss and invertebrates; medicinal leech. For other BAP species, such as water vole, otter, reed bunting, and many birds including common scoter and red-necked phalarope, ponds may be an important component of that species' habitat.

Like many other habitats the number of ponds in Scotland has declined in the last century. This decline may now be slowing or even reversing thanks to the recent incentive of pond creation through agri-environment schemes.

Ponds are extremely important as a wildlife habitat and refuge. In recognition of this importance it was announced in 2007 that “ponds” will join 65 other habitats on the UK Biodiversity Action Plan (BAP) list as a Priority Habitat. The habitat action plan is presently being drawn up and should provide more guidance on creation and restoration of ponds.



Photo: Prof J. S Bibby

## Importance of ponds

Ponds are important for a wide variety of wildlife. They are often very rich habitats, particularly important for aquatic invertebrates, wetland plants and amphibians. They are also used by a variety of mammals, birds and fish. They become even more valuable where ponds form part of a mosaic with other wetland habitats.

## Threats to ponds

Ponds are under threat due to mismanagement, development pressure, pollution and drainage. Mismanagement can often occur unintentionally when ponds are cleaned out disturbing the pond ecology. If in doubt create a new pond rather than disturb an old one.

## Pond Creation and Design

A pond provides a valuable habitat, particularly if attention is given to the design and construction detail. There are three key factors which are critical to the creation of high quality wildlife ponds and all aspects of pond design can essentially be summarised under these headings:

- unpolluted water
- close proximity to other wetland or freshwater habitats
- a varied design.

A wildlife pond should be irregular in shape in order to optimise the edge to area ratio: this is because much wildlife interest occurs in the shallower pond margins so create an undulating pond edge. In the same way the pond profile should be very gently sloping or shelving at the edges, gradually deepening towards a core area.

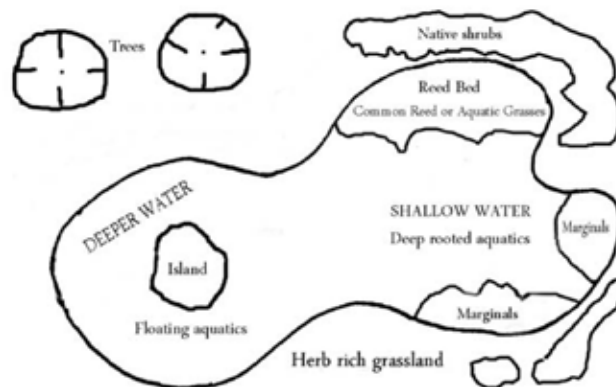


Diagram: Prof J. S Bibby

This will provide a variety of conditions for a range of aquatic plants and animals. The depth will depend upon the size of the pond; however a minimum of 60cm and up to 1m in a larger pond should provide adequate depth to keep water temperature reasonably stable during both warm and cold temperatures.

Ensure a natural irregular design that follows the contours of the land. An inflow (and outflow) may be needed if the pond is not fed by ground water.

The profile should be gently shelving to allow for marginal plants to grow around the edge to provide shelter and food for wildlife.

The shallows should be 10 – 25cm and occupy up to two thirds of the pond area, with a couple of deeper pools between 50cm and 75cm deep.

A variety of natural materials could be used around the edge to provide a range of habitat types e.g. rocks or a woodpile as shelter for amphibians. This can also be useful as habitat for over wintering of insects and amphibians

## Vegetation

“Emergent” plants are rooted in water but grow out of the water e.g. spearwort. Pond plants include “marginal” wetland plants, such as marsh marigold *Caltha palustris*, water mint *Mentha aquatica*, flag iris *Iris pseudacorus*. A shallow inundated area would maximise the opportunity for these plants to establish.

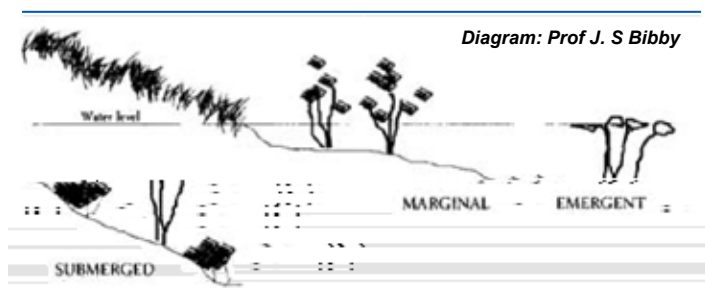


Diagram: Prof J. S Bibby

*Ranunculus flammula*, water forget-me-not *Myosotis scorpioides*. These plants help to stabilise the pond edge as well as providing important food for aquatic and terrestrial insects. Emergent vegetation is also important for nymphs of dragonflies and damselflies to emerge from the water to metamorphose. Floating leaved plants such as water lily and broad-leaved pondweed are also an important part of the aquatic ecosystem.

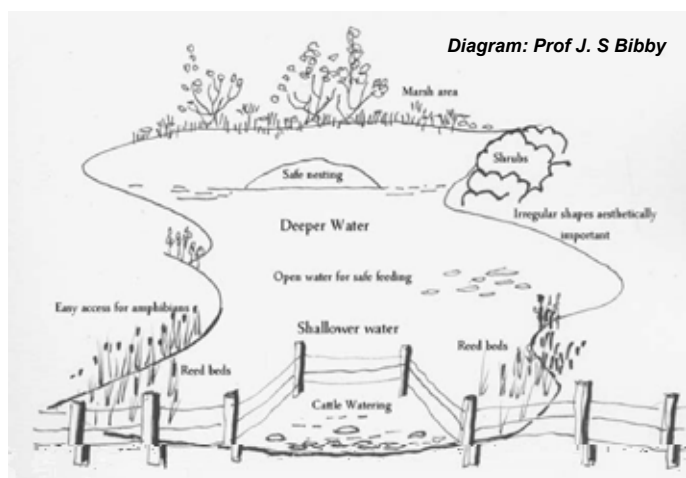


Diagram: Prof J. S Bibby

Care needs to be taken to avoid erosion of the banks particularly where stock have access to watering points as this could have cross compliance issues for anyone in receipt of Single Farm Payment.

## Fish and invertebrates

Ponds will naturally colonise over time but this process can be kick started. Invertebrate life can be encouraged in a small pond by bringing into the pond a bucket of mud and water from a well established local pond. Make sure you have the landowners' permission to do this and ensure that your chosen local pond is healthy and does not contain any non native or invasive species. Kick starting in this way is not essential; colonisation by amphibians and invertebrates will take place at your pond without any intervention even in the most urban situation. It is sometimes better to wait for this to happen than run the risk of unsuitable species in your pond.

Fish are a natural component of the fauna of some permanent ponds. However only half of all freshwater plants and animals can coexist with fish, this means that there is a wide range of pond animals, including most amphibians (except toads), that survive better in ponds without fish.

Consequently, fish stocking can be particularly damaging to small water bodies, although the effects will vary depending on the species stocked. In general if you want your pond for wildlife don't stock it with fish.

## Legislation and planning

The Water Environment and Water Services (Scotland) Act 2003 gave Scottish ministers powers to introduce regulatory controls over activities in order to protect and improve Scotland's water environment. That is wetlands, rivers, lochs, transitional waters coastal waters and groundwater. In fulfilling this the Scottish Environment Protection Agency (SEPA) will regulate activities such as abstraction, impoundment and engineering activities under the Water Environment (Controlled Activities) Regulations 2005. Therefore if you are creating a pond or substantially renovating one you must consult SEPA for permission.

You must also consult your local council planning department for guidance on planning regulations if you are creating a pond as in many cases all but the smallest of ponds needs planning permission

## Pond Restoration

If an old pond is to be restored there are many things to think about.



Photo: H Bibby

Firstly find out what is already there. Undertake a survey before beginning management work such as dredging or extensive tree removal. It is

always best to find out the wildlife importance of a habitat before intrusive management begins. Surveys are likely to be essential if (a) the pond is part of a designated site such as a Site of Special Scientific Importance (SSSI), or in an area of long established semi-natural habitat and is therefore likely to be of high quality (b) the pond is suspected of supporting protected species EG great crested newt (c) it is likely to have archaeological interest with, for example, a continuous sediment record of 100 years or more (d) invasive management of the pond is likely to be required.

Not all ponds need extensive management. In peatland systems, dune slack pools, dubh-lochans and other natural pools the only requirement is to be protected from pollution. Often no other management is needed

than this and being allowed to go through the natural processes of succession.

If dredging, tree-felling or sediment removal are necessary (perhaps for amenity reasons), avoid drastic changes. In particular do not change more than about 25% of the existing site.

Water quality is critical to pond ecological quality: so reduce the intensity of land management in as much of the pond's catchment as possible. For example, install buffer zones around ponds, and along streams and ditches draining into ponds, the wider the buffer zone the better (10m or more). These buffer zones may be grazed or ungrazed but should not have fertiliser, pesticides or other chemicals applied within the zone. Where possible re-route inflows away from draining roads or intensively farmed land to avoid contaminants in the water.

Do not remove marginal or aquatic vegetation from ponds unless it is clear what benefits will occur (e.g. maintain areas of submerged and floating-leaved plants for dragonflies). Clearing ponds is often undertaken for amenity purposes, such as creating a better view over open water or increasing areas of open water for fish. Be aware, however, that where such management is extensive (i.e. covers more than one third of the pond) this may damage the pond's existing wildlife interest.



Plant management is most effective where it encourages the development of complex plant mosaics. This may include locally thinning extensive stands of emergent plants to allow room for other plants to colonise and provide a greater variety of habitats for invertebrates and amphibians. However, take care not to destroy large stands of wetland plants completely. Management should never aim to eliminate a native plant species from a pond completely. Thinning and disturbance is seasonally sensitive and should ideally occur in early spring.

Shallow ponds often dry out occasionally - the pond community is unlikely to suffer in the long term, and some species may benefit. In particular, don't undertake extensive deep dredging which is likely to have much more damaging consequences. For example don't try to make long established temporary ponds permanent. Open water is not always necessary and wetland areas that are flooded in the winter can be equally important.

Allow natural colonisation; avoid planting countryside ponds with garden centre stock. With garden ponds, if planting is necessary introduce plants which grow wild locally to increase the wildlife value.



Where grazing is traditional, this is a very effective way of maintaining pond edges; stocking densities should be low. There is no single ideal density, so obtain advice from SAC for specific locations.

Before removing any trees or shrubs from a pond think about the benefits they are bringing. Trees and shrubs provide valuable shade but make sure there is also some open water.

Keep your habitats as diverse as possible when managing your pond, keep areas of deep shade as well as sunlit areas, use leafy sediment and gravelled areas along with aquatic and marginal plants.

If in doubt, leave the pond alone. Create a new pond rather than managing an existing one.

## Further information

Further information on all aspects of ponds can be found from:  
Scottish Agricultural College (SAC) Conservation Services  
Scottish Environmental Protection Agency (SEPA)  
Information on UK Biodiversity Action Plan Habitats and Species can be found from [www.ukbap.org.uk](http://www.ukbap.org.uk)

## References

Ponds pools and lochans - Scottish Environment Protection Agency (SEPA) 2000

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