Restoring Norfolk's ponds

Norfolk ponds and their origins

Norfolk has more ponds than any other English county with over 22,000 ponds present. These include farm ponds, village ponds, moats, medieval fishponds and ancient pingo ponds.

Over the last 75 years, most Norfolk ponds have either been neglected or filled in, often as a result of changes in farming practices. Today Norfolk's ponds are threatened by the widespread encroachment of trees and bushes (terrestrialisation), pollution and invasive species.

RESTORED POND

The Norfolk Ponds Project is a multi-partner organisation and we thank all partners for their contributions to this leaflet

The Norfolk Ponds Project aims to:

Reverse the decline of Norfolk's ponds so that the countryside contains a mosaic of clean water ponds with fewer ponds overgrown by trees and bushes

What is a pond?

The Norfolk Ponds Project defines a pond as a body of shallow, permanent or temporary still freshwater less than 100 metres in diameter.

Why are ponds important?

- Ponds can provide vital clean freshwater in the farmland landscape
- University College London research shows ponds to be vital habitats for plants, invertebrates, pollinators, amphibians, fishes, birds and many mammals in the farmed landscape
- Ponds support over two thirds of Britain's rarest freshwater invertebrates
- Good ponds act as stepping stones that allow species to move through the landscape
- Most ponds are man-made and are therefore important archaeological features.

RESTORED POND

CRUCIAN CARP

Farmland ponds in Norfolk

This guide focuses on Norfolk's plentiful farmland ponds. In North Norfolk many ponds have their origins as 17th-19th century marl pits used to provide a lime-rich clay to improve soils for crops, whilst the pits of South Norfolk provided unfired "clay lump" for traditional buildings of the same era. Once water-filled these pits were used for a range of other purposes on farms and in villages: livestock watering, fishing, the retting of hemp and flax and even for washing laundry.

Since at least the 1960s-70s, with the loss of many of the traditional reasons for using ponds, many have become overgrown by trees and bushes. Heavy tree-shading eliminates aquatic plant habitat, and where overgrown ponds dominate the landscape aquatic diversity is typically low.

There is now an urgent need to restore, and subsequently manage, Norfolk's ponds so that many more ponds are open to the sunlight. This allows wetland plants to grow in and around ponds in turn benefitting a wealth of other species. A well managed clean water pond in farmland is an oasis.

Principles of pond restoration

Clean and clear is good

Water free from effluents, fertilisers and farm chemicals is vital to the health of a pond. Ponds need to be as well buffered from run-off and fertiliser inputs from surrounding agricultural land as is possible.

Mosaic of sunny and shady ponds

A healthy pond landscape will contain a mosaic of ponds with different shade levels including many open sunny ponds which are typically abundant in wetland plants. Sunlight is essential for aquatic plants. Currently most Norfolk ponds are heavily overgrown by trees, so many more open-canopy ponds are urgently needed.

Not all ponds need restoration

Ponds in woodland, ponds surrounded by old and valuable trees (e.g. a very large Oak) and ponds with important associated bog and fen habitats are worthy of conservation in their own right and should not be disturbed without expert advice. Naturally formed pingo ponds and ponds of archaeological interest also require expert input before restoration. Also, not all pond restorations need to include mud removal and sometimes light works to reduce encroachment of trees and bushes around the pond edge is sufficient.

All shapes and sizes are great

There is no perfect pond shape or size so when undertaking a restoration the contours of the original pond should always be preserved and celebrated. By not working to a pre-described "ideal pond" formula, differences between ponds are maintained, leading to increased biodiversity in the pond landscape. Care needs to be taken to avoid breaking the natural clay seal of a pond's bed and clay should ideally never be removed from a pond. Equally, the hard banks of a pond should be disturbed as little as possible and it is important that the digger does not scrape these down as is typical of ditching work. It is also important that trees within hard banks are not pulled out by the roots, as this can damage the structure and flora of the banks.

Seasonal ponds

Seasonal ponds are good for wildlife too. Some ponds don't hold water all year round, but remain a vital part of the pond landscape mosaic and often support many rare plants and invertebrates. So don't worry if your pond dries up for part of the year.

Leave ponds to natural colonisation

Ponds should be left to natural colonisation by plants and animals. University College London research shows water plants to return quickly to restored ponds from dormant seed banks. It is important to avoid stocking plants from garden centres/horticultural suppliers which can lead to major problems with invasive species.

BEFORE RESTORATION BY MAJOR SCRUB AND MUD REMOVAL

AFTER RESTORATION

What does your pond look like?

OPEN POND

A

Low tree shading

Clear water

Abundant underwater and marginal plants

OVERGROWN POND

B

Trees and bushes shade most of the pond

Trees fallen in the pond

Water often grey-brown or green

Pond mud is black and full of leaf litter

Does your pond look like picture A?

Open ponds like pond **A** are rare in the Norfolk countryside and are very valuable for wildlife. They do not require major restoration and light, occasional scrub management will suffice.

Does your pond look like picture B?

If overgrown ponds like pond **B** are common on your land, then restoring some of them **(say 75%)** by tree and mud removal will greatly benefit wildlife on a farm.

A patchwork of ponds in a landscape, including open and overgrown and permanent and seasonal ponds, will likely support the highest diversity of aquatic plants and animals. In Norfolk we desperately need more open, sunny ponds for declining species such as stoneworts, dragonflies, Great Crested Newt and the iconic Crucian Carp.

SCARCE EMERALD DAMSELFLY

GREAT CRESTED NEWT

CRUCIAN CARP

Choosing ponds for restoration

Before restoring a pond it is important to consider the following:

Does the pond have any archaeological interest?

The shapes, slopes and bases of ponds are important and very old ponds may contain sediments of archaeological and environmental interest; these include moats and medieval fishponds. Sensitive restoration can enhance historic ponds, as well as protect important remains.

The Norfolk Historic Environment Strategy and Advice Team can provide advice to help ensure that restoration works are sympathetic. Ancient "pingo" ponds were formed thousands of years ago and careful consideration is needed before work is carried out on these. Most pingos in Norfolk are in the Brecks, just north of Norwich or near Kings Lynn. If you think the pond you want to restore might be a pingo please contact us and we will check this out for you.

Is the pond connected to ditches or to field drainage?

Inflow pipes and ditches that connect ponds to arable agricultural fields and other waterways typically result in polluted ponds, whilst increasing the potential for colonisation by invasive species (e.g. American Signal Crayfish). The best ponds for restoration are isolated ponds with no inflows. Restoration should also aim to buffer ponds from the surrounding farmland (and hence spray drift and surface run-off) by use of grass headlands. A rough grassland buffer of at least 10 metres is ideal.

Ponds subject to highway run off can be difficult to restore so expert advice should be sought.

Is it safe to carry out a pond restoration?

The activities associated with pond restoration carry many potential risks. Personal health and safety should never be compromised when carrying out a pond restoration. It is your responsibility to check that you or your contractors have suitable expertise and are covered by appropriate insurance prior to a pond restoration.

How do I prevent the transfer of invasive species?

Be wise to the threat of invasive species. If, for example, the invasive plant New Zealand Pigmyweed *(Crassula helmsii)* is present, then the pond should not be worked on without our expert advice. Tiny plant fragments from non-native plants that are transferred to ponds can lead to big problems. It is important that all contractors and volunteers are aware of invasive species issues and 'Check Clean Dry' procedures.

NEW ZEALAND PIGMYWEED

Are protected species present?

If the pond you plan to restore supports a protected species (e.g. Great Crested Newt) you must refer to Natural England guidance before commencing any work. In some instances a license from Natural England is required before work can take place. In most instances, with careful planning, works can go ahead without a license at a time when Great Crested Newts are not present in the pond. A good plan in this respect is do pond restorations after August when Great Crested Newt are less likely to still be present in ponds. Do contact us for help and advice.

Where should I put the sediment removed from my pond?

Mud removed from ponds on farmland can be spread on agricultural land. The soil should be spread out thinly away from any grassland buffers. It is really important not to spread the mud on species-rich grassland or on any other valuable habitats.

How to restore an overgrown pond

Restoration is best undertaken over the September to November period when the ground is dry and pond water levels are low. The period from the end of February to August should be avoided so as not to disturb breeding amphibians or nesting birds.

Tree and scrub removal

Trees and scrub should ideally be cleared from the south and west sides of a pond with some tree cover left to the north and east. Trees such as willow that are growing in the wet pond basin can be pulled out by the roots using a digger, but trees growing on the hard banks of a pond should be coppiced (as low as possible) so that the banks are not damaged. Where the south or west sides are hedges the plan can be adjusted. Aim to have a major impact such that less than 5-10% of the pond's surface is shaded by trees. A small team of volunteers working with a licensed chainsaw operator can do the job well. Mature oaks and other valuable trees should not be removed.

Mud removal

Removal of mud from a pond is necessary if a pond has been heavily overgrown for a long time such that the mud is deep, black and full of poorly decomposed leaves making it inhospitable to plants. Mud removal can be confidently undertaken with a tracked 360 digger. To have a major beneficial effect, aim to remove mud from at least 2/3 of the pond's area. Avoid the removal of underlying clay and don't change the natural dimensions of the pond or scrape the hard banks. In general, follow the natural contours of the existing pond and only remove soft silt.

Piles of brash and larger cut logs afford good terrestrial habitat for amphibians and mammals, as well as nesting sites for birds. Brash piles can be squashed down using the digger and will rot down in a few years. Avoid burning brash which releases a lot of carbon and other pollutants into the atmosphere.

Expose seedbanks

When restoring an old pond deeper sediment layers are often exposed that contain abundant remains of freshwater molluscs and water plants that grew in the pond long ago. If these kinds of sediment are found do leave some of this in the bottom of the pond and any of this sediment that is dug out can be placed around the edges of the pond at the end. This old seed-rich mud helps to quickly supply ponds with wetland plants from long-lived seed banks sometimes including very rare species.

Mud disposal

The ideal place to put the mud that is dug out of a pond is on a nearby arable field where it can be spread out thinly and subsequently ploughed in. Thus, planning pond restoration works to allow this to happen easily is a good idea. The highly organic pond mud makes for a good soil improver. Dredgings must not be used to fill in or to level adjacent wet areas or be placed on top of any areas of archaeological or ecological importance such as agri-environment margins, or wildflower-rich areas. Before disposing of silt excavated from ponds please refer to 'Waste exemption: u10 spreading waste to benefit agricultural land.'

Pond margins

If not already present a rough grassland margin (ideally at least 10 m) should be allowed to establish around the pond. This will protect the pond from sprays and agricultural fertilisers. Leave the pond and the pond margin to natural colonisation and do not add any seeds or plants. The land surrounding a pond should ideally support semi-natural vegetation including tussocky grasses, flowering plants, and scrub. The presence of bramble around ponds in arable landscapes is particularly important for birds and pollinators. In general the messier the pond margin the better, with a mixture of plant types and plant heights ideal.

What to expect following pond restoration

Water levels will drop during restoration if water-laden mud is removed, but ground water and winter rainfall will soon recharge the pond. A few weeks after restoration it is not unusual to see algal blooms, but by summer the water should be clear and water plants and amphibians will quickly colonise.

By mid-summer aquatic vegetation is usually flourishing and the pond will draw in many species from the wider landscape including dragonflies and many other invertebrates.

4 MONTHS AFTER RESTORATION

11 MONTHS AFTER RESTORATION

Managing ponds following restoration

It is important to cut back scrub on a regular basis, so that ponds do not quickly revert back to tree-dominance again. Management action might ideally take place every 3-8 years depending on pond size and the rapidity with which scrub returns. This type of management can be undertaken with tree shears, chainsaws, or hand tools depending on the scale of the work and available equipment. The job should not take too long - half a day per pond perhaps – allowing a number of ponds to be managed each autumn-winter.

It is important, not to manage all ponds in the landscape in one year, in order to maintain variety. Instead, a small proportion of ponds should ideally be managed at a time in rotation (e.g. a landowner with 10 ponds could manage 2 ponds per year). Such an approach to pond management will result in a landscape supporting ponds at different stages of succession with scrub of different ages, which is important for the maintenance of biodiversity in the landscape.

Sometimes restored ponds can start to become overrun by domineering marginal plants such as Bulrush (also known as Reedmace). Where this is happening it is often a good idea to periodically intervene and scrape out these plants using a digger. When removing plants, a rough rule of thumb is to retain around 20% of the marginal vegetation in the pond.

Norfolk Ponds Project

The Norfolk Ponds Project aims to reverse the decline of Norfolk's ponds so that agricultural landscapes contain a mosaic of clean water ponds with fewer ponds overgrown by trees and bushes.

This project was inspired by the magnificent pond conservation work undertaken by Richard Waddingham at Manor Farm, Briston, North Norfolk. Manor Farm has shown us that pond conservation and intensive agriculture can happily coexist.

Richard Waddingham at the Norfolk Ponds Project stall at the Royal Norfolk Show.

This leaflet is a guide for straightforward pond restoration, but we urge landowners to seek advice at any time, especially if complications or questions arise.

Where to go for further information

See the **Norfolk Ponds Project** web pages for more detailed information, including an extensive Guide to the Restoration, Creation and Management of Ponds – **www.norfolkponds.org**

Norfolk Ponds Project Twitter: @norfolkponds

Norfolk Wildlife Trust:
www.norfolkwildlifetrust.org.uk

UCL Pond Restoration Research Group:
www.ucl.ac.uk/geography/research/research-centres/pond-restoration-research-group

Norfolk Historic Environment Strategy and Advice Team:
01362 869285, HEP@norfolk.gov.uk

Norfolk Non-Native Species Initiative:
www.nnnsi.org

Norfolk FWAG:
www.norfolkfwag.co.uk

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NORFOLK PONDS PROJECT

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