

# FARM PONDS



*Other publications in this series*

FIELD BOUNDARIES ~ TREES ~ FARM BUILDINGS  
HEATHER MOORLAND ~ GIANT HOGWEED ~ PESTS



Department of  
**Agriculture and  
Rural Development**

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# FARM PONDS

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# THINKING ABOUT A FARM POND?

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Areas of open water are attractive features of the Northern Ireland countryside. They also represent a considerable fisheries resource and are important habitats for wildlife. Ponds support proportionally more species of freshwater invertebrates and plants than larger freshwater habitats such as lakes. Half of United Kingdom's most threatened higher plants depend on ponds.

While many farmers manage land close to open water, others have considered creating their own area of interest by:

- ~ developing a new pond;
- ~ restoring an existing pond that has silted up.

In most cases this is simply to create an attractive feature and encourage plants and water birds. Other possibilities include development of a 'put and take' fishery or a scrape, an area of shallow (less than 50cm) open water that provides summer feeding for wading birds.

There is a lot more to creating a good farm pond than simply digging a hole in the ground and hoping it will fill with water!

*FARM PONDS gives practical advice on siting, design, construction and management of farm ponds. It also provides information on the wildlife associated with ponds and wet areas.*



### IMPORTANT FACTS

Before making a start on a farm pond it is important to emphasise that:

- ~ a pond should never be created on areas that are already valuable wildlife habitats;
- ~ the proposed site should be assessed for its suitability;
- ~ new farm ponds require planning permission;
- ~ any proposals to abstract, divert, or retain water must not interfere with the free flow of water in a watercourse, or cause drainage problems upstream or down;
- ~ embankments to retain water must be structurally sound;
- ~ the development must not impede the passage of migrating fish.

### SITE SUITABILITY

The proposed site should:

- ~ not already be an area valuable for wildlife  
*Although ponds adjacent to existing wildlife habitats are particularly valuable, care must always be taken never to damage an existing wildlife habitat. Never dispose of material from a new pond or silt from an existing pond on a valuable wildlife habitat.*
- ~ form a natural hollow or depression in the land  
*The easiest and indeed some of the best ponds for wildlife are created by simply raising the water level of an existing hollow. This avoids major excavation work. Areas that are already valuable wildlife habitats should not be used.*
- ~ be capable of retaining water  
*Excavate test holes up to two metres deep across the proposed site. Check water levels in the holes throughout the summer to ensure they do not dry out – although temporary ponds have a very high biodiversity value. While it is possible to line ponds, the cost may be prohibitive.*



~ have a plentiful supply of clean water

*If the source of water is contaminated or the pond is next to intensively managed farmland, the pond will soon become nutrient rich. This will cause problems with excessive algal growth.*

~ be well away from existing services

*Any proposals must not interfere with underground or overhead services, such as, water, electricity or telephone. Adjacent overhead cables are a danger to anglers on a 'put and take' fishery and to wildlife attracted to the pond.*

~ be suitable for the particular type of pond

*A well-stocked fish pond attracts anglers and poachers. The pond, particularly if it is to be managed as a commercial 'put and take' fishery, should be within sight of the farm dwelling or farmyard to control access.*

*A peaty site is usually unsuitable for a 'put and take' fishery and in any case construction in peat may be problematic. Trout require well oxygenated water and have poor growth potential in peaty water, which tends to be acid. Also it is important to avoid draining any peaty sites that may have high conservation value.*

## PLANNING APPROVAL

All new farm ponds irrespective of size require full planning permission.

Application forms are available online from [www.planningni.gov.uk](http://www.planningni.gov.uk) or from local Department of Environment Planning Offices as follows:-

### *Ballymena*

Ballymena County Hall, 182 Galgorm Rd,  
BT42 1QF

Tel: (028) 2565 3333

E-mail: [divisional.planning.office.ballymena@nics.gov.uk](mailto:divisional.planning.office.ballymena@nics.gov.uk)

### *Belfast*

16-22 Bedford St, BT2 7FD

Tel: (028) 9025 2800

E-mail: [divisional.planning.office.belfast@nics.gov.uk](mailto:divisional.planning.office.belfast@nics.gov.uk)

### *Coleraine*

County Hall, Castlerock Rd, BT51 3HS

Tel: (028) 7034 1300

E-mail: [divisional.planning.office.coleraine@nics.gov.uk](mailto:divisional.planning.office.coleraine@nics.gov.uk)



*Craigavon* Marlborough House, Central Way, BT64 1AD  
Tel: (028) 3834 1144  
E-mail: [divisional.planning.office.craigavon@nics.gov.uk](mailto:divisional.planning.office.craigavon@nics.gov.uk)

*Downpatrick* Rathkeltair House, Market St, BT30 6AJ  
Tel: (028) 4461 2211  
E-mail: [divisional.planning.office.downpatrick@nics.gov.uk](mailto:divisional.planning.office.downpatrick@nics.gov.uk)

*Enniskillen* County Buildings, East Bridge St, BT74 7BW  
Tel: (028) 6634 6555  
E-mail: [divisional.planning.office.enniskillen@nics.gov.uk](mailto:divisional.planning.office.enniskillen@nics.gov.uk)

*Derry/Londonderry* Orchard House, 40 Foyle St, BT48 6AT  
Tel: (028) 7131 9900  
E-mail: [divisional.planning.office.londonderry@nics.gov.uk](mailto:divisional.planning.office.londonderry@nics.gov.uk)

*Omagh* County Hall, Mountjoy Rd, BT79 7AF  
Tel: (028) 8255 4000  
E-mail: [divisional.planning.office.omagh@nics.gov.uk](mailto:divisional.planning.office.omagh@nics.gov.uk)

*Work must not be started until planning permission has been granted.*

## DRAINAGE IMPLICATIONS

- ~ One of the most common sources of water for a farm pond is an adjacent watercourse. There should be no interference with the free flow of water in the watercourse. Weirs or other structures used to block the watercourse could result in flooding of adjacent land upstream of the structure.

## EMBANKMENTS

- ~ Where it is necessary to build an embankment to retain water, this should be well designed and properly constructed to ensure it does not give way with the pressure of water in the pond. A structural engineer should be consulted.
- ~ An engineer's certificate is required if the proposed pond is to hold more than 25000 cubic metres of water. This is equivalent to an area of one hectare with an average depth of 2.5 metres (2.5 acres with a depth of 8 feet).
- ~ For small ponds a simple earth embankment is sufficient. Not all soils are suitable and those with a moderate clay content are best.



### FISHERIES CONSIDERATIONS

- ~ The pond may require a licence for the culture of fish. Please contact [DARD fisheries Division](#) for further details.
- ~ The term 'coarse fish' refers to species such as pike, perch, roach and bream. Game fish include brown, rainbow and sea trout and salmon.
- ~ In the autumn, some species of fish migrate out of lakes and from lower reaches of rivers, moving upstream into small feeder streams to spawn.
- ~ In designing and constructing a pond the passage of migrating fish must not be disturbed by:
  - ~ *installing structures which prevent fish moving upstream;*
  - ~ *diverting an entire stream through a pond.*
- ~ Grids should be fixed over piped inlets and outlets.

Advice regarding the management of ponds and/or movements of fish to or from ponds may be obtained by contacting [DARD Fisheries Division](#), or [Inland Fisheries](#) at the Department of Culture Arts and Leisure.



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# DESIGNING A FARM POND

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## IMPORTANT FACTS

- ~ Careful planning and proper design are important points to consider when creating a pond that will be both attractive and valuable for wildlife.
- ~ The purpose for which the pond is intended will determine its initial design.

*Designing a Farm Pond provides guidance on the design of farm ponds for wildlife. Details are given on the special design features needed for duck and fish ponds.*

## POND DESIGN FEATURES

It is essential that a variety of features are provided to attract a range of wildlife to the pond. The following design aspects should always be considered when creating a new farm pond.

### *Size*

Any area of freshwater, no matter how small, is capable of providing a habitat for wildlife. The larger the pond, however, the greater the diversity of plants and animals it will support.

### *Shoreline*

The shoreline of the pond should be as irregular as possible. This is important because:

- ~ it gives the pond a natural appearance in the landscape;
- ~ more aquatic and wetland plants are encouraged to colonise;
- ~ areas of calm water and shelter are provided. Duck are territorial and are more likely to nest and breed successfully if secluded sites are available around the pond banks.





### *Banks*

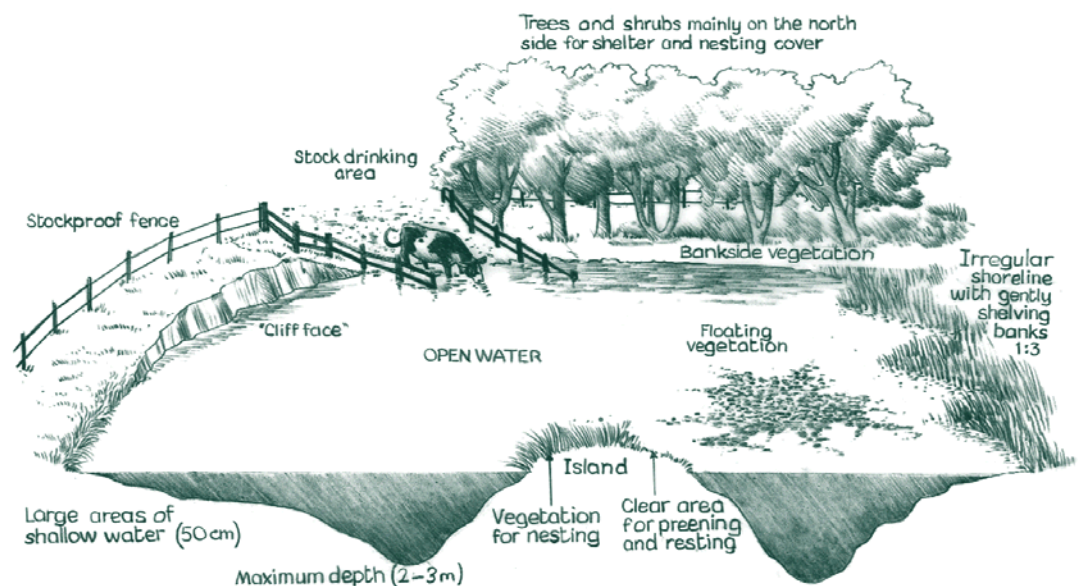
The banks of the pond should be gently sloping. This:

- ~ allows a wide range of aquatic plants to establish in the shallow water around the pond edges;
- ~ is safer for children compared with a pond with steep banks and deep water to the edges;
- ~ allows easy access for a range of wildlife.

Remember areas of bare mud around the banks can also provide valuable wildlife habitats.

### *Exceptions*

On large ponds, where possible, create a 'cliff face' on the eastern or western sides. This may attract kingfishers and sandmartins to nest. The 'cliff face' should be at least 1.5 metres above the surface of the water.



*Main design features to be included in a wildlife pond*



### *Water depth*

- ~ A pond should have a progression of water depths. The shallow edges should be between 150mm and 600mm. This allows aquatic plants to root. The edges should slope away to deeper water at the centre of the pond.
- ~ Deep water is less subject to fluctuations in water temperature. Also most aquatic plants will not grow beyond a depth of 2 metres. Areas of deeper water will therefore help to prevent the pond becoming overgrown with vegetation.

### *Islands*

Islands are an important feature of any pond. They extend the length of the bank where vegetation can colonise and also create 'safe' places where wildfowl can nest, rest and preen.

- ~ Always try to create at least one island, preferably two or three in a larger pond.
- ~ Islands need not be large, a diameter of 2-5 metres is sufficient.
- ~ Create islands by digging out around them rather than trying to reconstruct them after the pond has been dug.
- ~ Position islands as far away from the bank as possible.
- ~ Large islands should be crescent shaped with bays facing south to create shelter.
- ~ Plant vegetation such as reeds and flag iris around the edges of the islands. Also include some low growing shrubs such as willow, hazel or hawthorn. This creates cover for wildlife.
- ~ On small ponds, where construction of an island is difficult, rafts provide a useful alternative. Raft construction is described in [Ponds and Wildlife](#).



### *Establishing Vegetation*

No new pond is complete without vegetation. Plants will establish naturally with time but can be encouraged by:

- ~ planting wetland and aquatic species around the fringes of the pond;
- ~ planting trees and shrubs further back from the water's edge.

More details are given in [Establishing Pond Vegetation](#).

The area surrounding the pond must be fenced off to allow the vegetation to establish and to prevent disturbance of wildlife.

### *Special Requirements*

While many features are common to all ponds, flight ponds for duck and those to be stocked with fish have specialised design requirements. These must be considered before starting to dig the pond.

#### *Flight Ponds for Duck*

- ~ Dig the pond below or close to an existing flightline, for example, close to a river or a large area of open water. Duck will use inland ponds for night feeding.
- ~ Select a secluded site well away from roads and farmyards. This avoids disturbance.
- ~ Do not site the pond below overhead cables or close to tall trees. These may interfere with flightlines to the pond.
- ~ Maintain areas of short vegetation or create shelves of gravel around the banks where ducks can rest and preen.
- ~ Ducks such as mallard and teal prefer fairly shallow water in which to feed. Gently sloping sides are therefore essential.
- ~ Leave a reasonably large area of open water for ducks to land.

#### *Ponds for Fish*

Ponds may be stocked with fish purely for pleasure or as a commercial fishery.

- ~ Fish require high quality water. Ensure the water supply is free from pollution. It must also be well oxygenated – especially for trout.
- ~ Coarse fish such as roach, bream, carp and tench will tolerate poorer quality water than trout and they will also help to control vegetation.



- ~ The minimum water depth required for fish is 1.5 metres with deep holes down to at least 3 metres.
- ~ Brown or rainbow trout are normally used for stocking farm ponds. Care needs to be taken to ensure rainbow trout do not escape into nearby rivers.
- ~ Trout are available from the DCAL Fish Farm at Movinagher, Kilrea, Tel: (028) 2954 0533, and from commercial fish farms throughout Northern Ireland.
- ~ Movement permits are required before stocking ponds with fish and, in the case of salmonids, other licences may be required. These can be obtained from [DARD Fisheries Division](#), Annexe 5, Castle Grounds, Stormont, Upper Newtownards Rd, Belfast, Tel: (028) 9052 3434.
- ~ Appropriate stocking rates vary according to the ability of the pond to sustain fish, whether or not fish are going to be fed and the amount of fishing that will take place.
- ~ A sustainable fish population in an unfished pond is achievable with a stocking rate of 40-80kg/ha. Where the pond is to be fished the stocking rate should range from 150kg/ha for wild fishing to 500kg/ha for put and takes. Restocking may be needed to sustain the fish population at the desired level.
- ~ A newly developed pond should be left for at least one year, preferably two, before fish are introduced. This allows conditions in the pond to stabilise and vegetation to become established.
- ~ Fish are best introduced to the pond in spring.
- ~ As a general rule it is better not to feed fish as waste food will make the pond nutrient rich.



- ~ At higher stocking rates feeding will be necessary. If you feed, a fish culture licence is required from [DARD Fisheries Division](#). Consent to discharge water from the pond will also be required from the [Environment and Heritage Service](#).

*The creation of a new farm pond can involve considerable work and expenditure. Since it will be a feature of the farm and landscape for many years to come, careful planning and design prior to construction is crucial.*



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# POND CONSTRUCTION

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## IMPORTANT FACTS

- ~ Careful planning can greatly reduce the costs of farm pond construction. Many of the best ponds for wildlife are simply constructed, with minimal excavation, by flooding an existing area of land. Areas that are already valuable for wildlife should be left untouched.
- ~ A clean and reliable water source is essential. This can be supplied by a watercourse, a natural spring and/or ground water, or a combination of these.

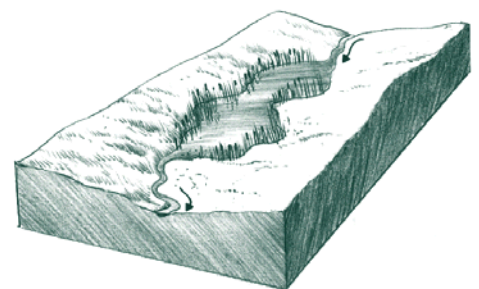
*Pond Construction provides guidance on the construction of farm ponds. Details are also given on water supply, water control and excavation.*

## WATER SUPPLY

- ~ From a practical point of view the simplest means of constructing a pond is by excavating in an area with a high water table. This allows the pond to fill from ground water or a natural spring. This type of pond will not require an overflow or inlet and is normally cheap to construct.
- ~ Where a watercourse provides the supply of water, ponds can be constructed as 'on-stream' or 'off-stream'.

### On-stream ponds:

- *are prone to silting up;*
- *may require temporary diversion of the stream to allow excavation or desilting;*
- *require an overflow to cope with excess flow when the watercourse is in flood.*

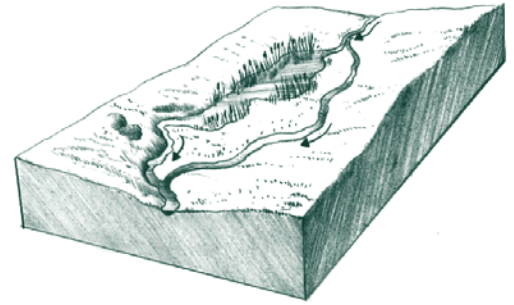


On-stream pond



Off stream ponds:

- *are often cheaper to construct than on-stream ponds;*
- *are less vulnerable to pollution;*
- *are easier to manage in terms of water through-flow.*



Off-stream pond

Both on-stream and off-stream ponds can be constructed by simple excavation or by impounding water using an embankment.

### EXCAVATION

- ~ Start at the centre of the pond and work outwards. Remove the topsoil first and keep it separate so that it can be used to cover any embankments or the pond edges.
- ~ After topsoil removal, excavation of the subsoil can start from the centre. Work to the full depth of the pond in one operation.
- ~ On wet sites the area under construction may need to be pumped dry to allow the working depth to be gauged accurately. Wet soil removed from the hole may need to be dried in small mounds before disposal.
- ~ During excavation take care to avoid damaging areas already valuable for wildlife.

### SPOIL DISPOSAL

In some situations the amount of spoil produced can be minimised. The creation of low embankments, for example, may increase the pond volume and ease the disposal problem. However, most ponds use simple excavation without an embankment so there will be large amounts of spoil for disposal.

- ~ It is easier and cheaper to spread thinly and evenly on adjacent land rather than to 'cart and dump'. Take care not to destroy existing wetland habitats when disposing of spoil.
- ~ Do not create unsightly 'spoil mountains'.



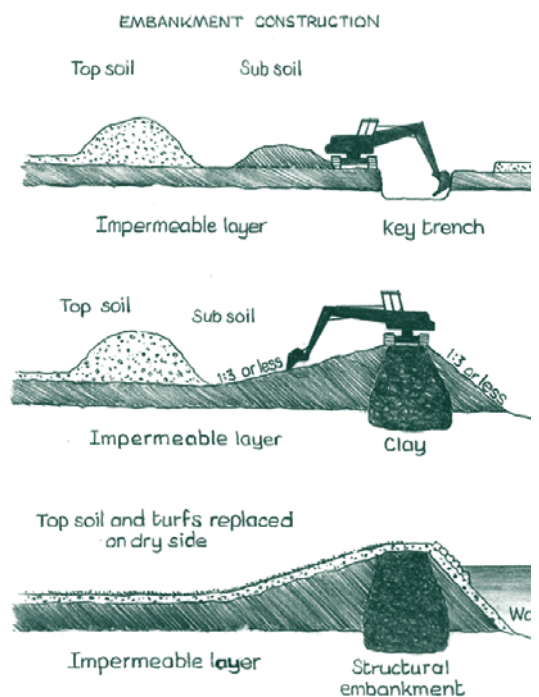
### LINERS

A lining, constructed from natural or synthetic materials, will be needed where the soil will not hold water. In practice the cost of artificial liners, however, may be prohibitive. Puddled clay may be a more feasible option where prospective sites have permeable soils.

### EMBANKMENTS

Embankments may be needed on some sites. Since they will be required to hold a head of water, it is essential that they are properly constructed.

- ~ A structural engineer should be consulted about the construction of any embankment. By law an engineer's certificate is required if the pond is to hold more than 25000 cubic metres of water above ground.
- ~ Check the soil type to assess its suitability. Soils with moderate clay content are best – no less than 20 per cent and no more than 30 per cent clay – with the rest made up by sand and gravel.
- ~ Strip the topsoil from the line of the embankment before construction and retain it for later use.
- ~ Once completed, dress the clay face of the embankment with topsoil and turves. Do not plant trees or shrubs on it. Sow creeping bent or rough stalked meadow grass to bind the soil.





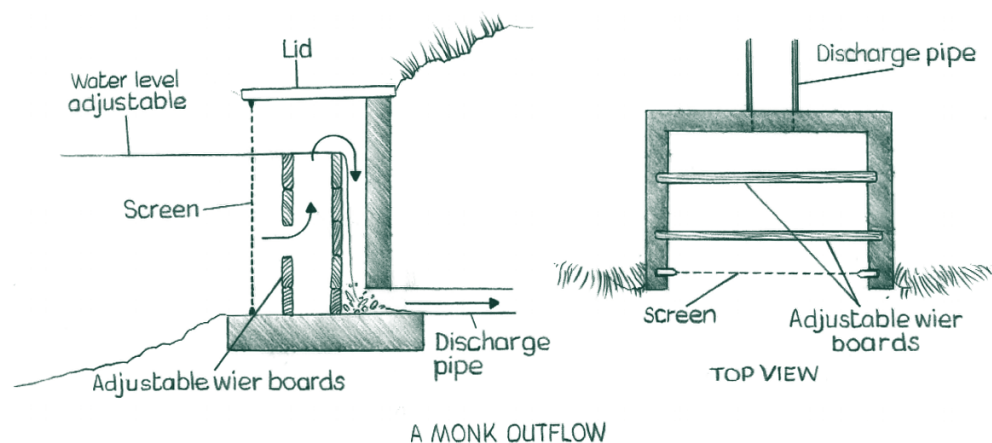
### WATER CONTROL

Most ponds need to be cleaned out at intervals because of silt deposition. Therefore it is very important to be able to divert the inflow of water and allow the water to be drained out of the pond so that desilting can take place. This is achieved by designing appropriate inlets and outlets.

#### Inlets

- ~ An inlet allowing some control of water supply is needed for all off-stream ponds.
- ~ An inlet can be a submerged pipe or an open ditch.
- ~ A small weir can be incorporated to raise the water level in the supplying watercourse. This will create a good head of water for supplying the pond. It must not, however, impede the free flow of water so causing flooding upstream.
- ~ The inlet must always allow most of the flow to continue downstream. Under the Northern Ireland Drainage Order (1973) it is an offence to alter the flow or route of a designated watercourse without seeking prior approval from [Rivers Agency](#) area office.
- ~ Silt traps will be needed on the inlets of on-stream ponds.

#### Outlets and Overflows



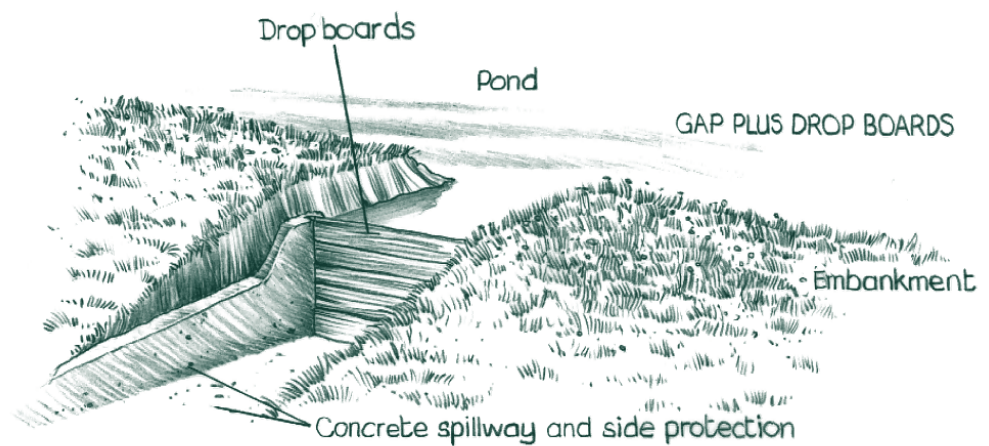
- ~ An outlet should be able to cope with the maximum flow of water into the pond, with capacity to spare.
- ~ Water should be released steadily from the pond to avoid eroding the banks.



# COUNTRYSIDE MANAGEMENT PUBLICATIONS

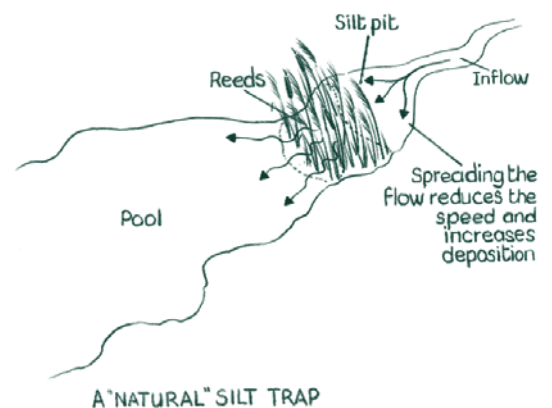
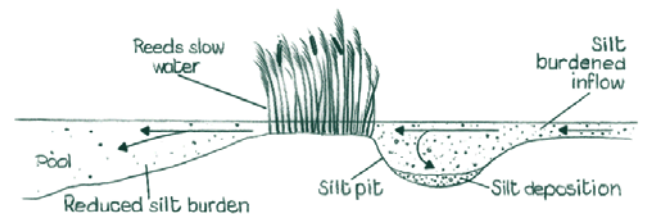
## FARM PONDS

- ~ Outlets should be carefully sealed to the surrounding soil to prevent seepage. Concrete anti-seepage collars can be used for this purpose.
- ~ Outlets should also be designed to avoid blockage by trash by using trash grids or some form of drop hatch unit.
- ~ The overflow from an on-stream pond must be sited in undisturbed ground. Avoid bare soil, it is better to have grass, concrete or cobbles to prevent erosion.
- ~ A gap plus drop boards, is a useful method of adjusting the water level within a pond which has been created by impounding.

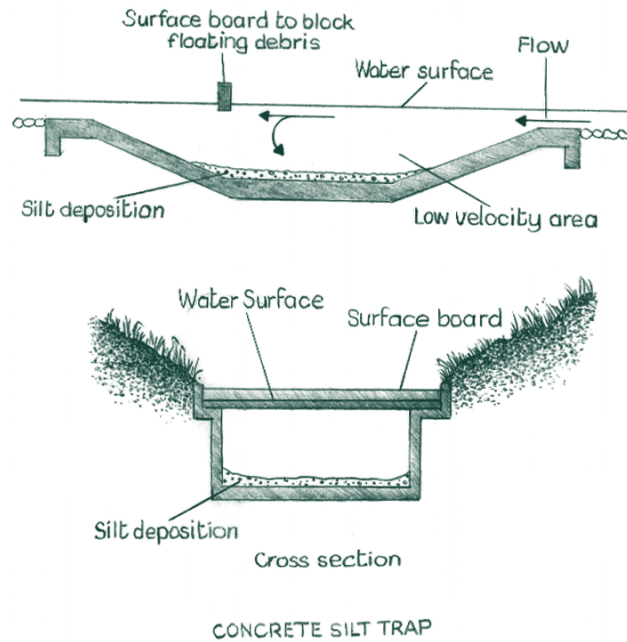


## SILT TRAP CONSTRUCTION

- ~ Large amounts of silt are carried by rivers when they are in flood.
- ~ Where water speed falls, for example, when entering an on-stream pond, the silt drops and a delta forms. The silt gradually fills the pond.



- ~ Silt traps can be used to catch the silt before it enters the pond. These can be 'natural', such as reed beds, or made of concrete. Man-made silt traps should be accessible and easily cleaned.



*A pond is a valuable asset to the farm and to the countryside. A well controlled supply of clean water and careful construction will ensure that the pond remains for future generations to enjoy.*



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# ESTABLISHING POND VEGETATION

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## IMPORTANT FACTS

- ~ No new pond is complete without vegetation.
- ~ The establishment of wetland and aquatic plants, trees and shrubs provides a source of food and shelter for a wide variety of wildlife.

Vegetation in and around a newly excavated pond will establish naturally given time. Colonisation may be relatively quick if, for example, the pond is dug in an existing wetland area. On other sites, however, it may be desirable to help this process along by carrying out some planting.

*Establishing Pond Vegetation provides information on the range of vegetation associated with ponds and gives guidance on their establishment*

## OBTAINING SUITABLE PLANTS

The area around the pond must be fenced off from livestock to give the vegetation a chance to establish.

Many garden centres now sell aquatic and wetland plants but it is often better to take 'native' transplants from an established pond. Do not take too many plants from any one place.

### Remember:

It is an offence to uproot any plant growing in the wild without the consent of the landowner. In addition, some wild flowers such as globe-flower (*Trollius europaeus*) and water violet (*Hottonia palustris*) are protected by the Wildlife (Northern Ireland) Order 1985 and cannot be uprooted without licence.

## GUIDANCE ON PLANTING

- ~ Once plants have been obtained, the roots must be kept wet until they can be introduced to the pond. If planting is delayed, immerse the roots in shallow water.



- ~ Plant pond vegetation in the spring. This gives plants a full growing season to become established.
- ~ Introduce groups of the same plants in specific locations around the water's edge. This enables each species to become established without competition and as the pond matures, a varied waterside flora is created.
- ~ Avoid introducing exotic species such as Canadian pondweed and water fern which will quickly take over the pond and choke other aquatic vegetation. These exotics should never be planted and if they are introduced inadvertently on other plants, dispose of these where they will not enter a watercourse.
- ~ Do not introduce too many plants to the pond as this can lead to management problems later on.

As a general guide plant:

- 4 marginal and emergent species;
- 2 floating-leaved species;
- 2 submerged species.

### Marginal plants

Marginal plants include water mint (*Mentha aquatica*), marsh marigold (*Caltha palustris*), yellow flag iris (*Iris pseudacorus*), meadowsweet (*Filipendula ulmaria*), purple and yellow loosestrife (*Lythrum salicaria* and *Lysimachia vulgaris*), watercress (*Rorippa nasturtium-aquaticum* or *Rorippa microphylla*), brooklime (*Veronica beccabunga*) and marestail (*Hippuris vulgaris*).



Plant these and other marginal species just above the water line by pushing roots or rhizomes gently into the soil.

### Emergent plants

Emergent plants include bur-reeds (*Sparganium erectum* or *S. emersum*), common spike rush (*Eleocharis palustris*), reed mace (*Typha latifolia* or *T. angustifolia*), sedges (*Cyperaceae* spp.), horsetails (*Equisetum fluviatile*), bogbean (*Menyanthes trifoliata*), marsh cinquefoil (*Potentilla palustris*), water plantain (*Alisma plantago-aquatica*) (include in large ponds only).



These should be planted in shallow water and their roots weighed down with heavy stones. Reeds will establish from metre long cuttings pushed into the ground at or just above the water level at an angle of 45 degrees.

### Floating-leaved plants

Floating-leaved plants include yellow or white water-lilies (*Nuphar lutea* and *Nymphaea alba*) (do not use exotic water-lilies), amphibious bistort (*Polygonum amphibium*) and broadleaved pondweed (*Potamogeton* spp).



*Amphibious bistort*

Introduce floating-leaved species on gently sloping banks up to a water depth of 30cm.

### Submerged plants

Submerged plants include pondweed (*Potamogeton* spp), water milfoil (*Rhyriophyllum* spp.) and crowfoot (*Ranunculus sceleratus*).

These can be easily established by tying the roots to a stone and throwing the stone into an area of water up to one metre deep.

### Free-floating plants

Free-floating plants include bladderwort (*Utricularia* spp.) and liverworts (*Riccio* spp.).

Introduce free-floating plants by throwing a few handfuls into open water and allowing them to disperse.

## PLANTING TREES AND SHRUBS

The planting of trees and shrubs in the area surrounding the pond gives it a more natural appearance in the landscape and provides food and cover for a range of wildlife. Where possible, trees should be planted to create a 'corridor' of woodland between the pond and existing hedgerows or woodland along which wildlife can move in safety.

~ Plant a mixture of native broad-leaved species. Include trees such as willow (*Salix* spp.), alder (*Alnus glutinosa*) or birch (*Betula pubescens*) and also add some hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), hazel (*Corylus avellana*), spindle (*Euonymus europaeus*) or guelder rose (*Viburnum opulus*).



- ~ Avoid ornamentals such as leylandii and other 'garden' species. These will do little to enhance the appearance and are of limited value for wildlife.
- ~ Do not plant trees and shrubs too close to the water. Where possible keep species such as alder and willow back three metres from the edges of the pond and tall trees such as oak and ash back at least 15 metres.
- ~ Allow light to reach the pond. Trees are best planted only on the north and west sides.

Further details on the planting of trees and shrubs can be found in [Trees](#).

*The establishment of vegetation in and around a new pond will improve its appearance and encourage wildlife. If appropriate species are selected and a little care and attention given to their establishment, the pond will quickly become an attractive feature, rich in wildlife.*



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# PONDS AND WILDLIFE

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## IMPORTANT FACTS

- ~ A well designed and properly managed farm pond can support a rich variety of plants and animals.
- ~ It is important to realise that such animal life may include some predators such as herons, foxes and possibly mink or otters.
- ~ Ponds support proportionally more species of freshwater invertebrates and plants than larger freshwater habitats such as lakes. Half of the United Kingdom's most threatened higher plants depend on ponds for their survival.

*Ponds and Wildlife* outlines common wildlife species found in and around ponds and discusses measures to enhance existing farm ponds for the benefit of wildlife.

## PLANT LIFE

Still water within a pond creates the conditions necessary for many different plant species. The vegetation around the pond edges is also an important feature. A rich variety of plants will attract an abundance of insects, birds and animals.

### *Trees and shrubs*

Trees and shrubs normally associated with ponds and their wetland habitats include willow and alder. These plants like wet conditions although they cannot tolerate prolonged immersion. Alder and willow have their seeds dispersed by water so they naturally end up where they grow best – towards the water's edge.

### *Marginal Plants*

In the marshy areas around pond edges, rushes and sedges are common. These grow together with tall lush plants such as purple loosestrife, willowherb, meadowsweet, yellow flag iris and water forget-me-not.





### *Emergent plants*

The shallow water of pond banks is often the richest in plant life. Most of the vegetation in this area is tall and can cope with the fluctuating water levels. A wide range of plants including bogbean, horse-tails, sedges, water plantain and reeds survive here, producing a dense fringing vegetation.

### *Floating-leaved plants*

Some plants root in the mud beyond the swampy pond edges allowing their leaves to float on the surface of the water. The particularly attractive yellow and white water lilies grow well here, together with broadleaved pondweed and water crowfoot.

### *Submerged plants*

In deeper water pondweeds are found totally submerged with their roots attached to the mud at the bottom of the pond.

### *Free-floating plants*

Also in deep water, floating plants are commonplace. Duckweeds, the tiny aquatic flowering plants, spread their leaves on the surface of the water to catch the sun, often causing still water to become covered in a carpet of green.

### *Algae*

Although often microscopic in size, algae are vital to all life within ponds, providing food for aquatic animals. They also generate oxygen within the water.

Excessive algal growth, however, is a common management problem. Pond management is dealt with in [Pond Management](#).

## ANIMAL LIFE

Ponds can support a tremendous range of animals that spend all or part of their lives in water.

Bank side vegetation is often rich in animal life attracting mammals to drink, feed and clean themselves. Mice and shrews, for example, are enticed by the plant and insect life around the pond and these in turn bring predators such as stoats, foxes and badgers.

Bank side vegetation also provides a home for many types of insect such as caddis fly larvae and water snails which feed on algae. Water boatmen, great diving beetles, dragonfly and damselfly nymphs prey on these species.



Fish such as minnow, stickleback and trout live in open water. They depend on snails and aquatic insects for food, searching in the bottom mud or amongst the vegetation. Some fish also eat plants, especially algae.

Frogs and newts use ponds and lakes mainly as breeding grounds, returning each spring to mate and lay eggs. The young tadpoles are wholly aquatic, living at first on plants and later feeding on insects. Tadpoles are food for many other aquatic creatures.

During the warmer months of the year Daubentons and Pipestrelle bats can be seen at dusk, flying low in search of insects.

### BIRD LIFE

An enormous variety of bird life is attracted to water.

Birds make use of ponds in different ways. Some depend on them completely and spend most of their lives on or close by. Duck, for example, feed while on the water either by diving, like the pochard and tufted duck, or by dabbling near the surface, such as mallard and teal. They also nest close to the water's edge and the young ducklings, as soon as they hatch, rapidly take to the water and feed on the abundant resources of the pond. Moorhens and coots feed on seeds, insects and aquatic vegetation using the reeds around the pond for nesting.



*Grey Heron*

Kingfishers are one of the most attractive birds that can be encouraged to a pond, particularly where there are low overhanging branches to rest or to hunt for small fish passing underneath over the pond.

Other birds such as snipe, curlew and lapwing, spend most of their life close to water finding food in the soft, marshy ground or lush vegetation around such areas of still water. The distinctive grey heron can also be seen waiting to prey on fish and frogs.

Birds like the sedge warbler and the reed bunting nest near water, though never venture onto the water itself. They build their nests among the marginal vegetation feeding on the abundant supply of insects attracted to the pond.



### Attracting Duck to the Pond

Provided the pond is on a flight-line, duck can be attracted by providing a supply of food. Simply throw a small amount of grain just below the water surface at the edge of the pond. This prevents food being taken by rats. It is important to feed at the same time every night and only put out as much as can be consumed in one day, otherwise the water will stagnate. Avoid any unnecessary disturbance to the duck while they are feeding or resting.

### Improving Ponds for Wildlife

Ponds can support many plants, animals and birds, however, areas of open water alone will not create valuable wildlife habitats. The following guidelines should always be followed.

- ~ Do not allow livestock to trample the pond banks. This prevents the establishment of aquatic plants and bankside vegetation and may pollute the pond.
- ~ On large ponds wildlife will benefit from a short section fenced off to allow livestock to drink. The poached ground provides a good feeding site for pied wagtails and bare mud a good site for basking dragonflies. Wet mud is a useful nest building material for housemartins.
- ~ Keep spray from slurry tankers, fertiliser spinners and crop sprayers back at least twenty metres from the edges of the pond. Always ensure the water supply to the pond is kept clean and free from potentially harmful substances.
- ~ Seclusion is essential for animals and bird life to feed and breed successfully. Avoid causing disturbance to birds and animals using the pond.
- ~ Keep tall trees well back from pond edges. Too many large trees around a pond can lead to stagnation of the water due to decay of leaves. Trees growing on the south and east sides of the pond will also prevent sunlight from reaching the water.



### 'HABITAT BOOSTERS'

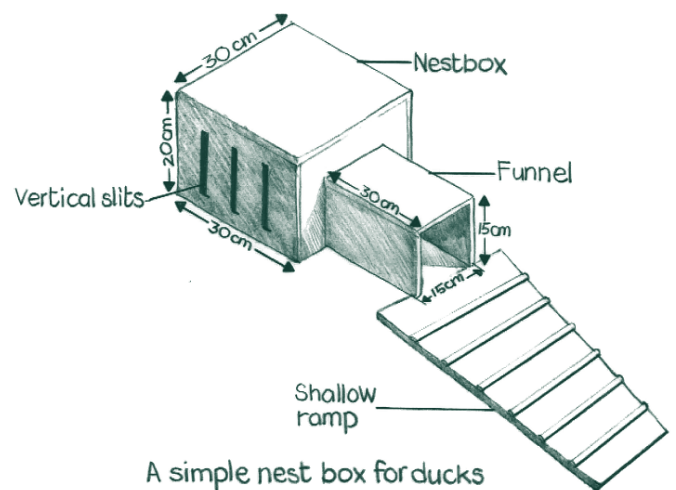
In new and existing ponds, bird life can be encouraged by providing 'habitat boosters'. These include nest boxes and rafts.

#### Nest boxes

The absence of suitable nesting sites around a pond can prevent birds from breeding, so the use of artificial nesting boxes can be worthwhile. Many different types of nesting box can be built to cater for birds of all sizes. These should be sited on trees close to the pond. Boxes with small entrance holes of 25mm diameter will attract blue tits and coal tits, while a box with a larger hole of 28mm diameter will be suitable for great tits and tree sparrows. Spotted flycatchers, pied wagtails, robins and wrens may use larger, open-front nest boxes.

Mallard ducks will also use boxes for nesting. These are best sited on rafts. Boxes should be 300mm square and 200mm high with horizontal slits cut into the sides so that the ducks can see out while nesting. The entrance should be 150mm square and, to prevent predation by crows, a 300mm long x

150mm square funnel should be placed over the entrance hole. A shallow ramp leading up to the funnel entrance should be constructed to enable ducklings to return to the nest.



#### Rafts

Where a pond has no islands, wildfowl can be encouraged to roost and breed on securely anchored rafts. Rafts can be made quite simply and cheaply as follows:

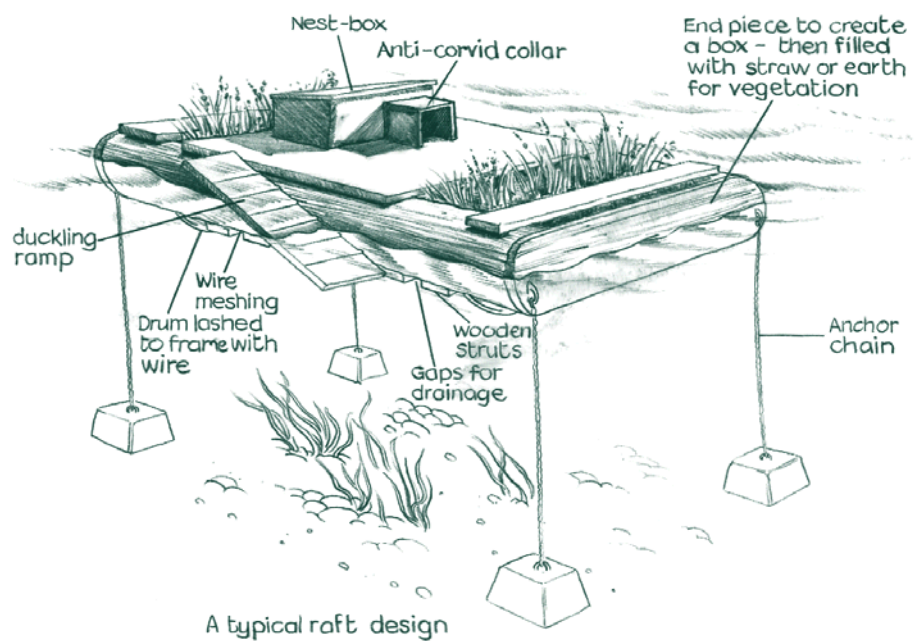
- ~ bolt together four main timbers to form the framework;
- ~ attach wooden slats across the top of the timbers to create a floor, leaving gaps between the slats to allow plant roots to grow into the water;
- ~ staple rabbit netting or chicken wire over the slats;



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## FARM PONDS

- ~ make the raft buoyant by mounting it on expanded polystyrene blocks or sealed plastic drums. Make sure the plastic drums are cleaned out;
- ~ fasten wire netting around the buoyancy tanks and attach it to the main frame. This ensures the tanks won't break free;
- ~ attach a gently sloping ramp to the side of the raft to allow duck to enter and leave the water;
- ~ launch the raft and ballast to the correct weight using gravel or shingle in the centre of the raft until the slats almost touch the water;
- ~ put some soil and plants around the edges of the raft to create natural cover;



- ~ once in position, the raft should be anchored securely. Chain the raft to large masonry blocks on the pond bed. The anchor chain should be fastened to opposite corners of the raft.

*These are just a few of the many plants and animals which rely on ponds and wetland areas. A well designed and properly managed pond makes a particularly attractive feature on the farm and can provide a tremendous source of interest and enjoyment.*



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# POND MANAGEMENT

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## IMPORTANT FACTS

- ~ A well designed and properly constructed farm pond will minimise the need for management.
- ~ During their lifespan, however, almost all ponds will require some human intervention.
- ~ The main problems are:
  - *siltation;*
  - *algal blooms;*
  - *excessive growth of aquatic vegetation;*
  - *overhanging vegetation.*

To maintain an attractive pond, which is also of benefit to wildlife, proper management is essential.

[Pond Management](#) *provides guidance on dealing with some of the more common pond problems.*

## MANAGEMENT GUIDELINES

- ~ Pond management operations should be carried out in late summer or early autumn. Disturbance to the vegetation at other times of the year disrupts breeding wildlife and removes sources of food.
- ~ Where the removal of certain trees and shrubs is necessary around pond banks, this should be delayed until late winter. This avoids disturbance to nesting birds and maintains berries and seeds – an important source of food for birds and mammals over the winter months.
- ~ To prevent loss of habitat and adverse effects on wildlife, if possible, no more than half the pond should be desilted or cleared of vegetation in any one year.



## COMMON PROBLEMS

### Siltation

Ponds supplied with water from a river or stream will periodically require the removal of deposited silt. Where sediment is allowed to accumulate, the water level becomes shallow and the pond is more likely to dry out as a result of evaporation. Eventually the pond will dry out and revert to marsh.

- ~ Silt can be removed using a tracked digger or dragline working from the bank.
- ~ Ideally, no more than half the pond should be desilted in any one year. If this is not practical, retain some of the original silt in the bed of the pond. Leave an established area of vegetation to aid recolonisation.
- ~ Silt contains a high proportion of water and therefore can be difficult to handle. Grade it thinly over the banks and adjacent land but do not cover any valuable wildlife habitats around the pond.
- ~ If the removal of silt from the pond poses too many problems, drain the pond and let the silt dry where it is prior to removal. This reduces the volume of material to be handled.
- ~ Desilting presents an opportunity to re-grade the pond banks, creating gently sloping sides, an irregular shoreline and islands.

Silt removed from the pond must not be allowed to enter a watercourse. The discharge of suspended solids to a watercourse is an offence under the Water (Northern Ireland) Order 1999.

Many established ponds and lakes in Northern Ireland support a rich diversity of plants and animals and it is important that they are managed sensitively.

### Control of algae

Excessive growth of algae is a common problem in many ponds and is often difficult to control.

- ~ In new ponds, algal blooms can occur for the first few years after excavation. This often disappears as conditions in the pond stabilise.
- ~ Algae can also cause difficulties in established ponds where nutrients are entering the pond from surface run off, drainage water, seepage or direct pollution. A reduction in the use of fertilisers in the catchment area for the pond will reduce this problem. Nutrient enrichment caused by decaying organic matter within the pond can also lead to algal growth.



Filamentous algae can be removed by raking or using a dragline to clear the pond but this gives only temporary control. Adding straw to the pond can also help to control algal growth. Barley straw is best and should be added in early spring at a rate of one bale per 25m<sup>2</sup>. To prevent further algal growth, the source of nutrient enrichment must be identified and stopped.

## CONTROL OF AQUATIC VEGETATION

Aquatic vegetation is an important part of any pond. However, where growth becomes excessive, the area of open water is reduced and management will be required. Control generally needs to be repeated every 7 to 10 years.

## GENERAL GUIDELINES

- ~ Aim to clear excess vegetation from half the pond in one year and the remainder the following year. This minimises the disturbance to wildlife and allows the cleared area to recolonise rapidly.
- ~ Always remove cut or uprooted vegetation from the pond. If left, the decaying vegetation will cause deoxygenation of the water.
- ~ Leave cleared vegetation lying on the bank side for 2-3 days to allow wildlife living on it to return to the pond.
- ~ Where rare plant species are present, special care will be needed to ensure their continued survival.

### Methods of control

The best methods of vegetation control from a wildlife point of view are hand digging or cutting and hoeing but these methods are not always practical. Mechanical diggers cause more disturbance but can be useful in larger ponds provided there is access from the pond banks.

Selected herbicides are available for use in water but should only be used as a last resort to control particularly invasive species. The use of approved herbicides in or near watercourses requires consent from the [Water Management Unit](#) of the Department of Environment.

### Manual control and clearance

In shallow areas, hand digging and clearance is the most effective and safe method of vegetation control. Wherever possible all unwanted marginal vegetation should be removed by this method. Digging removes the entire root system and so regrowth is avoided.





### Mechanical clearance

Mechanical diggers or tractors with rear mounted back excavators are useful for clearing pond vegetation. They can be positioned on the pond bank and used to dig out blocks of plants including their root systems.

There are several drawbacks with this method – the reach of the digger limits the extent to which vegetation in the pond can be cleared, and stable banks are required to allow the machine to work. Damage to trees and bank side vegetation may also occur.

*Do not be too thorough.* Indicate to the digger operator that clumps of vegetation need to be left to recolonise the pond.

### Control of common invasive plants

#### *Canadian Pondweed*

Canadian pondweed is an introduced species which can quickly take over in ponds. It is difficult to eradicate since broken stems re-root easily. Canadian pondweed is best controlled by raking in spring before plants are developed.

#### *Floating-leaved plants*

Yellow and white waterlilies and other floating-leaved plants often need to be thinned to allow light to reach the surface of the pond. Where the pond is too deep for these plants to be pulled out by hand, the underground stems need to be cut with slashers. When free of silt and mud the roots will float to the surface where they can be removed.

#### *Reeds*

Clumps of reeds around ponds provide valuable cover for wildfowl. Reeds can also be invasive, particularly common reed and reed mace. They may be controlled by cutting loose the mats of roots and dragging them ashore. Alternatively, in drier areas, reeds can be dug out but this is best carried out during August and September once the reeds are fully grown. Where water is largely overgrown the pond may require dredging to keep them in check by creating a deeper body of water.

#### *Rushes*

Rushes will only grow in shallow water. They are easy to control manually by digging.



## MANAGEMENT OF OVERHANGING VEGETATION

Vegetation close to the water's edge is particularly valuable for wildlife, especially wildfowl. Some areas should be kept short and other areas allowed to grow long with tussocks so that sunning and preening areas are mixed with cover and nesting sites.

Keep trees and shrubs well back from the water's edge on the southern and eastern sides to allow light to reach the water. This also prevents large quantities of leaves falling to the bottom of the pond. Leave a few bushes intact as they provide useful sources of food and cover.

*Ponds can be particularly attractive and interesting features of the countryside but they do need to be managed. Time and effort spent on management is well worthwhile to protect these valuable habitats.*



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# FURTHER INFORMATION

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For advice on any issue relating to agriculture and the management of the countryside contact:

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