

# **Report and Management Recommendations for Ducklington Village Pond**

Rod d' Ayala, Ecological Consultant, October 2009

## **CONTENTS**

### Text

|                                     |        |
|-------------------------------------|--------|
| Background                          | Page 2 |
| Survey Date and Methods             | Page 2 |
| General Pond Ecology                | Page 2 |
| Site Description and Survey Results | Page 3 |
| Summary of Management Issues        | Page 5 |
| Management Options                  | Page 6 |
| Suggested Management                | Page 8 |

### Maps

Map 1 – Suggested Management, Ducklington Village Pond

### Appendices

Appendix 1 – Species List, October 2009

Appendix 2 - Potentially Suitable Native Aquatic Plants

## Background

Ducklington Village pond was visited at the request of Ducklington Parish Council, given concern about its condition, primarily the lack of water in the pond. The management suggestions in this report were drawn up taking into account on site discussions about the existing land use and any potential limits for change e.g. restricted land use, public access and public perception. The report is intended to provide information about ponds in general and this pond in particular such that informed decisions can be made about its future management. Any management suggestions are just these – suggestions and not fixed and/or the only way to approach the management of the pond and its surrounds.

The pond is located in area with open public access and this and the allied public perception are both potentially important considerations in devising future plans. An important component of any plan for the pond is the need to inform people on site about the purpose, type and extent of any proposed work. Work plans need to be clear and understood in easily available clearly written documents - to ensure the future continuity of management in the event of changes in people involved with the site.

## Survey Date and Methods

The pond was visited on 13 October 2009. Only a limited survey was possible as the pond though not completely dry, held only very shallow water in the lower part of the pond only. Thus the normal netting survey for aquatic invertebrates was not possible and survey work was limited to plants in and around the margins of the pond banks - and to a lesser extent the wider terrestrial surrounds. The late season of the survey was inappropriate for amphibians with all species expected to be in terrestrial habitats and not in the pond, even if the pond had held a significant amount of water. The records for species are listed in Appendix 1. Additional information about the pond and the species that use it was supplied by local residents.

## General Pond Ecology

To ensure that the later sections of this report, including any specific management recommendations are clearly understood it is useful to provide summary information about the ecology of ponds. Major advances have been made in the understanding of pond ecology in recent years (primarily through research by Pond Conservation) and much of the traditional perceived wisdom about what makes a good pond and how ponds should be managed has been shown to be at best simplistic and at worst potentially damaging for their ecological value.

The traditional view of a good pond for wildlife is often a permanent water body with deep water and some but not too many water plants (i.e. plenty of open water) – limited to perhaps a narrow fringe of taller water plants around its edge. There is minimal shade from trees i.e. no or few trees stopping the sun reaching most of the water. Ducks (or other kinds of water birds) and/or fish if not pre-requisites are often seen to be desirable features. The pond surrounds are usually managed to at least some extent, if not actually kept “tidy” in a formal manner.

In reality this is only one type of pond – in this case the model for the most useful functional pond that supplied man with many of his domestic, agricultural or industrial needs. Ecological research has shown that in reality all ponds can be good for wildlife, however small or large, permanent or temporary, shallow or deep, shady or sunny, whatever the quantity or type of silts or pond bottom substrate. Habitats in ponds that would in the past have automatically been condemned, such as

dead wood or sprawling living trees are potentially good features - as too are areas that dry out. All of these different habitats can support different and/or specialist species.

Under the right conditions the classic pond described above and much favoured by man, can support a high number of animal and plant species. It is the many non-standard ponds (including early and/or late succession ponds) that are more likely to support the rare, unusual or specialist species.

The three main factors that control the ecological quality and potential species richness of a pond are as follows:

- clean (i.e. unpolluted) water -the volume and regularity of supply is less critical
- good (i.e. wildlife friendly) surrounds which provide both supporting or complementary habitats in their own right as well as buffering the pond from any damaging external influences
- variety of structure or habitat within the pond, produced by presence of different plants, variable basin shape and depth, bottom substrate, water chemistry, quantity and type of silt, density of shade or light levels etc.

Thus many ponds that do not fit the “traditional” image of a good pond are in fact potentially very good for wildlife, and their existing ecological value would be destroyed if they were managed according to the traditional model. Many traditional ponds will in fact never achieve their maximum ecological potential. For example, typically for functional reasons the volume and permanence of water is often more important than its quality and the most “useful” ponds are often situated in less wildlife friendly landscapes and/or they have a very simple (but very functional) structure.

A fourth factor that may influence the number of species in a pond is its proximity to other wetland habitats with an existing wetland fauna and flora – i.e. there is potentially a greater number of available species to colonise a pond if it close to other wetland habitats. However, colonisation by species is not a simple process and much will depend on the available methods to move – some species move easily even over a long distance others are sedentary and cannot easily move even very short distances.

The other key research finding about ponds is that on a wider scale (i.e. not individual ponds but the whole range of ponds in any given landscape area) ponds support more species of plant and macro-invertebrate (two of the better studied groups of aquatic life) than other freshwater habitats i.e. rivers, streams, lakes and ditches. Ponds also support up to twice as many rare or uncommon species of these two species groups than other freshwater habitats - with these rare or uncommon species being much more likely to be found in early or late succession ponds. The overall large number of species found in ponds is perhaps not too surprising as ponds are extremely variable habitats (every pond is different).

Generally the larger freshwater habitats such as rivers, streams, lakes and ditches tend to have less complexity of habitats compared with the whole range of ponds - and/or being either large or continuous provide fewer opportunities for specialist species or species with low tolerance of competition. Being continuous and well-connected habitats with much bigger water catchments, they are very likely to suffer from poor or reduced water quality as a result of polluting land management activities within their catchment. Ponds however often have small self-contained catchments, which are or could more easily be relatively immune from outside negative problems such as chemicals or other problems associated with run off or drainage from intensively managed or polluted land.

## Site Description and Survey Results

Ducklington Village Pond is located on the green in the centre of the village, opposite the Old School and Old School House. The pond is located at national grid reference, SP 35850 07578 (GPS). The pond is surrounded by short mown grass on three sides and on the fourth an area of mostly unmanaged grass, scrub and trees - between the pond and neighbouring properties.

The pond itself is approximately 26 metres by 28 metres (its maximum dimensions), with a more or less central island made in part of large stones, on which grows a Weeping Willow. At the time of the survey the pond was more or less dry with only the lowest part of the basin covered by very shallow green and turbid water. It is believed the main water supply of the pond is groundwater, hence the condition of the pond at the time of survey. October 2009 coincided with a period when water levels in all ponds were at a very low level, especially groundwater fed ponds – groundwater being at as low a level for approximately ten years. Apart from direct precipitation and surface run-off from its immediate surrounds the other notable and potentially problematic source of water entering the pond is drainage via six pipes from the adjacent section of road. The normal high water level of the pond is approximately forty centimetres above its current level.

The upper part of basin is exposed bare gravel - with below this an increasing thickness of covering silt measured up to thirty centimetres at least in this survey, and reported to be more in the deepest part of the pond (not waded into during this survey).

Probably the most notable and obvious fauna and flora on the pond is the population of up to 60 feral ducks, of which only one was present at the time of the survey – a calling duck. (It is possible that the ducks had moved elsewhere because the pond was so dry.) The ducks are fed by some of the local people, though the local policy is to actively discourage this activity. There is, for example, a permanent sign close to the pond asking people not to feed the ducks.

Only low number of species of wetland plants, were recorded in the survey. No aquatics (species characteristic of open water habitats) were recorded. There were seven species of marginal / damp loving plants around the edges of the basin, with two being particularly abundant i.e. Yellow Flag and Greater Pond Sedge. All of the recorded species were generally common and widespread in similar habitats in Oxfordshire and regionally. One small annual wet loving plant was recorded in the wet exposed mud i.e. Toad Rush. This was the only wetland plant in the main part of the pond, which otherwise supported some annual terrestrial plants. (The presence of these plants suggests the upper parts of the pond at least dries out on a regular basis.) Other species often found in damp areas include native wild Willows. The Weeping Willow on the island in the middle of the pond has obviously been deliberately planted. The bank side stands of plants such as Sedges grow in distinct clumps, with mown and/or trampled short grass areas between these clumps leading down to the waters edge.

The terrestrial pond surrounds were not recorded in detail – but also did not appear to be species rich. However, any surveys in October are likely to be indicative only and should not be relied upon to give a true idea of the value of any of these areas. The area of mixed undisturbed habitat at the back of the pond was less well recorded in this survey and probably the area of the surrounds being most likely to be the best area for wildlife in general.

The pond contains the remains of an old tree. Deadwood is a useful habitat in ponds (e.g. egg laying sites for Hawker dragonflies which lay on dead wood and bare mud).

In recent years the management and history of the pond was reported to be as follows. The pond dried out in 2004 and while dry it was dredged to try and increase the depth and permanence of

Report and Management Recommendations, Ducklington Village Pond, October 2009

water. Up to two to three feet of silt was removed from the deeper parts of the pond during this dredging. Following this work when the pond re-filled, fish were introduced (Rudd and Tench) which apparently bred quickly. However, all these fish died in 2006, when the water level in the pond again dropped very low. Goldfish are also reportedly seen in the pond on a regular basis (deliberate introductions).

There were very few incidental records over and above the records (mostly plants) made from in and around the pond. However one of potential interest was a Louse Fly – a parasitic fly that feeds on birds that may well be present around the pond, because of the presence of large numbers of ducks on a regular basis.

### Summary of Management Issues

Before any plans can be made about the future management of the pond it is worth highlighting the issues that will need to be considered to ensure any plans achieve their desired outcomes, within the available resources.

**Purpose of Pond** – Thus fundamental question is in some ways the simplest to resolve, but in other ways one of the most difficult as it is likely that there will be several opinions about what is best. What should be the balance between ducks or fish and other wildlife (e.g. plants, invertebrates and amphibians)? Should the pond be used as duck feeding site – does this function provide greater value for the village than a pond dedicated to a broader range of wildlife, (all of which are allowed to colonise and/or die out as part of a more “natural” cycle). It is very difficult, if not impossible, to have large numbers of feral resident ducks and a lot of wildlife.

**Clean Water** – Clean water is the single most important factor in maximising the potential ecological quality of a pond. In the case of Ducklington Pond the main water source i.e. groundwater that flows through the local underlying gravels, is assumed to be at least reasonably clean - but could be contaminated by local sources of pollution such as drains or soakaways from local residential properties. Local surface run off may pick up pollutants from the grass areas surrounding the pond, including duck faeces where lots of ducks gather together. When the ducks are present on site, presumably there is much enrichment of the water by direct precipitation of faeces into the pond. The other source of pollutants is the water that runs off the adjacent road, which could include both dissolved chemicals and solid particles, the latter speeding up the rate of silting up of the pond. In ponds with abundant ground water flows levels of pollutants may be less than ponds fed by rainfall, as relatively clean water is continually moving into and through the pond taking with it some of the problem chemicals.

**Ducks** – Large numbers of more or less resident ducks have two main impacts on the ecology of ponds. They can directly decrease water quality through enrichment by their faeces (see above). By continually dabbling in the bottom of the pond and trampling in shallow areas they stirrup and continually bring into suspension particles and enrich the water in another way. Ducks, especially in large numbers, will also eat plants and animals in the pond and/or otherwise destroy plants by trampling. Water with high levels of suspended sediment and/or high levels of nutrients will negate against many plants growing, without being eaten by ducks. Large numbers of resident ducks are usually maintained by regular extra feeding. One indirect of this feeding is that any uneaten food rots and further increases the nutrient levels of the water.

**Fish** – Fish, depending on the number and species present, can have similar impacts to ducks. Bottom feeding fish create cloudy dirty water. Their faeces will enrich the water having negative impacts on many plants and animals. Fish also consume plants and animals. Only the toughest

plants survive intensive fish grazing – typical of these are tall upright plants such as Reedmace, Yellow Flag and Pond Sedges some of which are found around the margins of Ducklington Pond. Even small fish cause problems. Two of the worst species of fish for reducing the total biomass and abundance of species of invertebrates and amphibians are Goldfish and Sticklebacks – in part because their size allows them to get into shallow areas not necessarily possible for larger species. Fish naturally would not be permanent features of ponds that dry out regularly such as the pond in Ducklington. They may not even naturally colonise unless they have good connections with permanent water habitats and/or other means of moving around. In many cases ponds are originally and kept stocked by people on the basis that ponds are thought not to be complete habitats without them. This is of course ecologically untrue.

Natural Fluctuations of Water Level – Groundwater fed ponds have an abundant supply of water (unless drainage or other ground works causes major changes in groundwater levels) but one that usually changes to some extent on a seasonal and annual basis. Ponds where this is the case will be colonised by species that can cope with such fluctuations – having strategies to cope when some or all of the water is lost. Some species leave the pond and return when it is full, others hide away in the mud in the pond. Some species will be lost but will re-colonise when water returns. There is relatively little research on this subject but what has been done shows that overall, life in ponds comes to no harm if even normally permanent ponds dry out and the number and type of species present before drying out are likely to be there when it refills. Some will be lost (e.g. fish) and others do better (e.g. perhaps amphibians as larval predation is reduced as larger predators such as fish are reduced in number for a period) but the number and type of species is very similar pre and post drying out. Species are continually being lost and gained from ponds for a whole variety of reasons, not just drying out.

Pond Surrounds – The best ponds for wildlife are most likely to be found in places that are generally good for wildlife. Ponds with intensively managed and/or developed surrounds are likely to be less good for wildlife. On one side of Ducklington Pond is a rougher area of ground managed infrequently or not at all, which simply dint of being managed in this manner adds to the value of the pond. The short regularly mown surrounds do little to add to the overall wildlife value of the pond. Good surrounds are good habitat in their own right, which enhance the pond habitats and can act as physical, chemical or biological filters for potential pollutants in habitats beyond the pond and its surrounds.

Past Management – The species that live in a pond are often the result of previous management as much as the current nature of the pond. For example regular cleaning out of plants in a pond means that larger and/or more robust species often come to dominate simply because they are very difficult to kill! More sensitive species, though perhaps once common cannot grow back as fast even if they survive the direct and indirect effects of well intentioned but misguided plant clearing. They are much more likely to be lost. Much management is in fact carried out for non ecological reasons and often does nothing to solve the actual problem(s) but the symptoms cause dby the underlying problem(s).

### Management Options

Pond Function – There needs to be an agreement locally as to the priority function(s) of the pond. If popular opinion supports a duck and/or fish pond then other wildlife will be heavily compromised at best, and not viable at worst.

Permanence of Water – It would be possible to have a more permanent pond by lining the lower part of the basin to a height close to but below the normal high ground water level such that it still

benefited from the groundwater in the winter but once full the water did not drop when the groundwater dropped. At times of higher groundwater the pond would of course be deeper. Care would need to be taken to make sure any liner used did not float up (under pressure) and/or was not capable of being holed or damaged by movement of water or any materials the ground water may carry with it below the liner. At times of year when groundwater is low the pond would only be topped up by other sources of water, as this water would not drain away to ground. Allowing the pond to continue as groundwater fed will need an acceptance that its level will fluctuate – not a problem ecologically but potentially one for human reasons.

The pond could be sealed entirely from all but very high groundwater by a higher liner – but then the overall supply of water would be dramatically reduced in most of the time in terms of volume and potentially in terms of water quality. It would then be fed in large part by drainage from an urban (polluted) catchment. Reduced water quality would not be good ecologically and could also cause symptoms that would impact on the pond in an aesthetic visual sense too (extreme algal blooms).

The above approach could be adopted and groundwater used to flush out and/or top the pond if required if a water extraction license was obtained from the Environment Agency to take water via a borehole. It has to be noted that the more complex the management solution, the more expensive and complex the restoration and ongoing management will become.

Exclude or Clean Up Road Drainage – Drainage off the road will cause two problems – firstly a reduction in the water quality in the pond, and secondly a source of silt. The rate of silting up may be significantly faster as a result of being supplied by water off the road. To make the pond better one option would be to re-direct the water away completely – but this is probably impossible as water will always find its way to the lowest point eventually, i.e. the pond. However, by creating one or more shallow basins between the pond and road - run off could be cleaned up to a greater or lesser extent and its load of silt removed before it entered the main pond. These ponds will act as biological and physical filters – all the heavier silts will be removed and depending on the length of time the water can be contained and season of the year – the dissolved elements reduced. Water from the pre-pond would be cleaned better if was allowed to seep through an earth bank or drain away through a sump, rather than flow direct via an overflow pipe open channel into the main pond direct.

Existing Silt – Shallow water is OK for most wildlife, with for example most invertebrates not needing any more than ten centimetres of water. Thus for most wildlife (plants, invertebrates and amphibians) at least, deep water is not needed. However, if the existing silt is very rich and contaminated (derived from large numbers of ducks and/or fish and road run off) it may be worthwhile to remove some of it – to improve water quality. If the chosen management for the pond includes cleaning up and stopping direct silting up from road, then the removal of the existing silt would be worthwhile and sensible as it would no longer be added to. However, if silt is still going to be accumulating from the road run off and perhaps from continued erosion and accumulation caused by large numbers of ducks – it would be less worthwhile to de-silt. Any such removal would be negated by the continuing input of silt and an ongoing cycle of silt removal would have to be carried out on a regular basis. Silt accumulates faster in deeper ponds, and thus work would be required on a more frequent basis the deeper the depth of pond required. Removal of large volumes of silt can be very expensive, especially if it is deemed to be contaminated waste and need to put into special landfill, rather than simply being dumped on nearby land.

Ducks – Any resident ducks, especially in large numbers, will continue to have a negative effect on plants, animals and water quality by direct predation, trampling and defecation. Feeding of ducks could also have negative effects on water quality. Thus a clear policy will be needed for the

presence or absence of ducks and if they are to be fed extra food (as opposed to relying on natural food).

Fish – Fish can have similar impacts to ducks and a policy will be needed for them too. Any movements of fish into or out of the pond should be licensed by the Environment Agency. Other movements would be illegal and run the risk of spreading problem species and diseases.

Pond Surrounds – Less intensively surrounds would be better for wildlife. The use / encouragement of a greater diversity of native local species and habitats around the pond would improve its potential for wildlife and perhaps make it more attractive to look at (though this will be very subjective). Planting does not have to be entirely native species but non-natives would need to be chosen with care to avoid any problems later – and native species could provide the same kind of structure and habitats.

Weeping Willow Island – The planted weeping willow provides a focus point for the pond, but one that is obviously planted and not a natural feature. Despite common beliefs ponds do not need have islands. Nesting birds can easily nest in dense stands of plants, and be safe from predators. The island could be removed, modified or left as it is according to the overall plan for the pond.

To Plant Up – Or Not? – The pond supports a limited range of plants (a survey in the spring when it has more water would be advisable to confirm the type of species present). If a greater variety of species was preferred, creating the right conditions for them and allowing them to colonise naturally is one option. However, the process of natural colonisation may be slow and rather hit and miss so some planting at least (if not blanket planting) may be the preferred option. What species of plant are used will depend on the overall management approach for the pond. If wildlife is an important aspect of the management / restoration of the pond then local native species (and local sources if possible) would be the recommended approach. Some non-native plants can be very invasive, and their introduction could cause problems on a bigger scale than any of the existing problems (real or perceived) the pond currently has. Whatever planting policy is adopted should be guided by good information about the pond - what is already present and what could grow once new habitats / conditions are achieved. Other species (invertebrates and amphibians) should be allowed to colonise naturally.

### Suggested Management

The final decisions about the purpose of the pond and thus the management required can only be made at a local level and will depend in part on what function the pond is required to have. For ecological reasons the following outline approach is suggested. Detailed work plans will need to be drawn up before any work can be undertaken on site:

- No changes are recommended to the hydrology of the pond – at least not in the short or medium term.
- If the existing silt is badly contaminated it would be worthwhile for some of it be removed, to reduce problems with water quality problems in the future. If the silt is relatively “clean”, this task would be optional and only carried out if resources were sufficient.
- Ducks need to be dramatically reduced in number and ideally reduced or allowed to dwindle until only wild visiting birds are present. No extra feeding should be allowed so the ducks that visit are not encouraged to stay (and attract others).

- No fish should be introduced in the pond.
- A good survey in the spring when the pond re-fills is recommended, to include plants, invertebrates and amphibians. This survey would inform the future management requirements of the pond.
- Depending on the survey results consideration could be given to diversifying the species of plant on site – but this will only be worthwhile if ducks are either absent, heavily reduced and/or unable to gain access to areas to be planted. Once established the barriers may need to be retained to avoid ducks trampling or eating the new plants.
- Road run off should be cleaned up, using pre-pond(s) located between the road and pond, on the road verge. The ponds will act as silt traps and chemical / biological filter for dissolved pollutants. The new ponds will provide additional wetland habitat in an otherwise ecologically dull area of short mown grass. Silting up of the pond should be significantly reduced.
- Other surrounds to be managed more sympathetically for wildlife with as much area as possible taken out of regular / intensive management. It is not significant what the habitats are (grass, scrub or trees). These habitats could be improved by targeted management to promote existing plant diversity - and also by deliberate seeding or planting with native species not already present. Pressure to continually over manage (“tidy”) the surrounds should be resisted, as the lack of disturbance is part of the value of the land. The plans for the surrounds need to include good access to the pond, so that people can see and get close to the water if they want to. Un-intensive management does not mean no management at all.
- It will be necessary to inform local people about the purpose and rationale behind the proposed management as many will not be aware of the true ecology of ponds - having grown up with the many myths about ponds that only now are being shown to be either wrong or very simplistic.

**APPENDIX ONE – Species List, October 2009**

Supplied separately as an Excel Spreadsheet

## APPENDIX TWO - Potentially Suitable Native Aquatic Plants

The following lists are offered as a guide to the type of species to include in a planting mix for a pond for wildlife, where the aim of the pond is to create as natural a pond as possible. (Check plant records for your local area as well.) A mix of exotic and native, or just exotic species can provide similar pond habitats, if a mix of species types is used (the variety of habitat structure plants produce is very important). However native species are much more likely to support more species overall because they are native and have developed over a long time a suite of associated life.

Note: Plants known to grow on site already are highlighted in **bold**.

### Submerged Aquatic Plants

Rigid Hornwort *Ceratophyllum demersum*  
Common Water Crowfoot *Ranunculus aquatilis*  
Water Starwort, *Callitriche stagnalis*  
Curled Pondweed *Potamogeton crispus*  
Ivy Leaved Duckweed *Lemna trisulca*

### Sprawling and/or Low Emergent Plants

Water Mint *Mentha aquatica*  
Water Forget Me Not *Myosotis scorpiodes*  
Water Plantain *Alisma plantago-aquatica*  
Brooklime *Veronica beccabunga*  
Watercress *Rorippa nasturtium-aquaticum* – Potentially invasive  
Fools Watercress *Apium nodiflorum* – Potentially invasive

### Floating Leaved Plants

Amphibious Bistort *Polygonum amphibius*  
Broad Leaved Pondweed *Potamogeton natans*

### Upright and/or Tall Emergent Plants

**Yellow Flag** *Iris pseudacorus*  
Sweet Flag *Acorus calamus*  
Branched Bur-reed *Sparganium erectum*  
Common Spike Rush *Eleocharis palustris*  
**Pond Sedge, Greater** or Lesser *Carex riparia* or *C. acutiformis*  
**Soft Rush** *Juncus effusus* – Grows at or close to high water level  
Hard Rush *Juncus inflexus* – Grows at or close to high water level  
Jointed Rush *Juncus articulatus*

### Low Growing Grasses - One of the best invertebrate and amphibian habitats

**Flote Grass** *Glyceria fluitans* – A common true aquatic grass  
Creeping Bent *Agrostis stolonifera* – Common terrestrial grass capable of growing in pond edges

### Bare Mud Plants (Drawdown Zone)

Celery Leaved Buttercup *Ranunculus sceleratus*  
Lesser Spearwort *Ranunculus flammula*

### Marginal Plants - Growing at or above the high water level

Marsh Marigold *Caltha palustris*  
Ragged Robin *Lychnis flos-cuculi*  
Marsh Woundwort *Stachys palustris*  
**Purple Loosestrife *Lythrum salicaria***  
Water Figwort *Scrophularia auriculata*  
Hemp Agrimony *Eupatorium cannabinum*  
Pendulous Sedge *Carex pendula*  
Angelica *Angelica sylvestris*

All aquatic plants can be invasive, so plant a good variety of them such that there is a good show of plants and plenty of variety of structure.

The list does not include several of the larger and taller or otherwise more potentially problematic local native species which can take over ponds very quickly, e.g. Reedmace (or Bulrush) *Typha latifolia*, Common Reed *Phragmites australis*, Reed Sweet Grass *Glyceria maxima*, White Water Lily *Nymphaea alba* and Yellow Water Lily *Nuphar lutea*.

The list above includes generally common species but not other natives that may not be so common or not even grow at all naturally in the local area. Many familiar garden pond plants often fall into this latter category e.g. Bogbean *Menyanthes trifoliata*, Fringed Water Lily *Nymphoides peltata* and Greater Spearwort *Ranunculus lingua*. This type of species can be almost as fast growing and potentially invasive as the non-natives (see below).

Avoid at all costs accidental introductions of foreign truly invasive species such as New Zealand Pigmy Weed *Crassula helmsii*, Canadian Pondweed *Elodea canadensis*, Curly Waterweed *Lagarosiphon majus* (and similar species) and Parrots Feather *Myriophyllum aquaticum*.

Try to avoid Garden Centres when purchasing plants, they tend to be expensive and you run the risk of contamination with unwanted species including the non-natives. There are specialist suppliers of aquatic plants, but the best option of all is to collect locally from clean "wild sites" (with the permission of the landowner). A few plants go a long way in ponds, as many grow easily from cuttings and they will soon spread once established