

## **Survey of Pond and Surrounding Area, Radley School**

Rod d'Ayala, 19 July 2002

### **Background**

The aim of this survey was to establish the presence or absence of Great Crested Newts, and gather other baseline ecological information for the site. The pond and its surrounding area (located at national grid reference SU 523 993) are adjacent to, and in the grounds of Radley School, and are used by the school for educational activities including pond dipping. The survey results provided will inform the development of an ecological management plan for the pond and its surrounding area. The survey was carried out for Radley Parish Council.

### **Methodology**

The terrestrial survey involved walking around the site, recording the plants and habitats present. The pond was surveyed visually and by sampling with a long handled pond net, from both the pond edges and by wading into the pond edge. Searches were also made of suitable terrestrial habitat for amphibians and other animals (e.g. under logs). Other species, e.g. butterflies were recorded as incidental records.

### **Results**

A full list of species found during the survey is included in this report in Appendix 1.

The survey was carried out late summer and hence those species active or present earlier in the year will not have been recorded. Thus the list of species recorded in this survey should not be viewed as comprehensive, but merely indicative of those present or using the site. No rare or uncommon species were recorded in this survey.

Two maps are included, see Appendix 2. The first of these is of the whole site showing the habitats present on site, including the main trees. The second map shows only the pond and its immediate surrounds, in more detail than the first map.

### **Overall Physical Site Description**

The site in total is approximately 25 metres by 40 metres. The pond is approximately 24 metres by 14 metres, located at the north (road) end of the site. The south (school) end is in part, a shaded area, dominated by trees with a minimal ground flora (partly because it has been cut). The remaining part is open and grassy (also recently cut) with shorter mown paths that lead to the pond and its dipping platform. There is a linking path around the entire circumference of the pond. The site is bounded alongside the road by a wall, topped by a wooden post and rail fence. The other boundaries are fenced, with continuous hedges or scattered bushes. There is some terrestrial habitat, in the form of logs, paving slabs and a pile of cut vegetation which provides potential terrestrial cover for a variety of animals.

### **The Pond – Vegetation and Physical Structure**

Approximately half the area of the pond is open water and half covered by aquatic vegetation. There are no aquatic submerged plants and the only plant growing in the open water is a small group of Water Lily. The vegetation in the pond edges is dominated by tall emergent plants of which the most abundant species are Yellow Iris, Pond Sedge and Reed-mace. Other species present include Arrowhead, Water Figwort, False Fox Sedge and Hairy Willowherb. Hard Rush grows around the pond edges, and marks the high winter water level. There is a large willow at one corner, under which is an area of open shady water.

A medium sized Willow grows next to (and currently over) the dipping platform. There are two

small Willow saplings elsewhere in the pond edges. The depth of water varies, with the edges being up to approximately 60 to 70 cm. The depth in the central part of the pond was not measured (but was too deep to wade into).

The bottom substrate is a mixture of stones, silt and leaf litter. The range of habitat niches is varied, with both shady and sunny areas, the different substrates and a mix of plants. However, most of the plants are tall emergent species with a relatively simple underwater structure, and the pond lacks the variety and complexity that would be present with low growing broad leafed marginal emergent plants and submerged weed. Thus although there is some complexity of habitats within the pond, all *of which will* support pond life, it is not as diverse as it could be. Usually the more varied a pond's physical and vegetative structure the more species of animals it will support.

### **The Pond - Invertebrates and Other Fauna**

A single Blue-tailed Damselfly was seen over the pond. Dragonfly and damselfly larvae are aquatic, but none were found in this survey. Overall only a few species of invertebrates were caught, which is not entirely unexpected given the large number of fish in the pond and the lack of (vegetation) cover. There are at least 8 large Goldfish present in the pond and a large number of Sticklebacks. Fish eat invertebrates and will also eat aquatic plants, especially the submerged weeds and low marginal aquatics, which provide an important habitat for many pond invertebrates.

No amphibians were found, either in or around the pond or using the terrestrial cover. Ideally an amphibian survey would be carried out earlier in the year, when adults, eggs and/or larvae would be present in the pond. By later in the summer, adults have mostly left the pond and many of the Frog and load tadpoles have left the pond too. At a good site for amphibians it would be expected to disturb adults or new young amphibians from the area surrounding the pond, even where cover is limited (as in this case). The pond would probably have a few late Frog tadpoles and is likely to have newt tadpoles, which often develop later than frogs and toads. The lack of amphibians including newts is probably because of predation by fish, of both their eggs and/or larvae. All newts lay their eggs singly, wrapping them in marginal aquatic vegetation. They are vulnerable to being eaten by fish, either directly or when the fish browse the water plants.

Great Crested Newts are more vulnerable than other species, because of the habit of the larvae of swimming in open water, rather than seeking cover. Thus, the pond with its lack of suitable egg laying habitat and cover, and large number of fish is unsuitable for all kinds of newt, especially Great Crested. Although long lived, the introduction of a few individual animals of Great Crested Newts as long ago as 1991 would mean that even if they stayed in and around the pond (which they may not have) these original animals are unlikely to be present now. If the fish have been a regular feature of the pond for several years and prevented Newts from breeding they are likely to have died out, even if some of the original animals did stay.

Although, given the survey was late in the year and the results of the amphibian survey cannot be taken as definitive, it is very likely that the pond supports only a small population of amphibians, if any, and probably no Great Crested Newts. The area of terrestrial habitat is small and not optimal, which would further reduce the potential of the site.

Only a few species of aquatic invertebrates were found, suggesting that this group of organisms is also affected by the large number of fish (both directly through predation and indirectly by modification of the pond habitat). The most common invertebrate seemed to be the Water Sister, with Pond Skater and Water Boatmen. Only dead water snails were found (three species identified). All these species are tolerant of poor water quality and capable of surviving with fish. Fish can create, and maintain high nutrient levels in ponds, by their continual disturbance of the bottom sediment, which if undisturbed would normally trap nutrients. Feeding fish with extra food will add to these levels.

### **Terrestrial Flora**

The dry areas of the site appeared to support a range of common grasses, herbs and trees. Some trees have been planted. Given that the survey was undertaken late in the season, after the area had been cut - it is likely that not all species present on site will have been recorded. All the plants found in this survey were common and widespread species.

### **Terrestrial Fauna**

A Grey Squirrel was seen feeding in the trees. Some common garden birds, namely Blackbird, Chaffinch, Greenfinch and Wren were seen feeding, and probably nest suitable sites (e.g. hedges).

Some common species of butterflies visit the site. Although small and not species rich, it is an island of relative unintensively managed habitat when compared to its immediate surrounds. The butterflies seen in this survey included some with larvae that feed on grasses i.e. the Essex Skipper and Gatekeeper; shrub feeding larvae i.e. the Holly Blue and a general widespread wandering species, the Large White, whose larvae feed on Crucifers. This group of colourful and attractive insects could be encouraged more with sympathetic management. Another insect, the predatory Scorpion Fly *Panorpis* sp., was also seen.

The fauna records are only incidental, and indicative of the type of species present on site not the full range it supports. Although small the site will be important locally as a feeding and drinking area for a variety of common birds, insects and other animals.

Appendix 3 is an annotated map, showing the specific tasks needed on the ground, to fulfil the management recommendations outlined below.

The site is only small, but contains a variety of habitats - trees, hedges grassland and a pond. It already supports a variety of wildlife - plants, birds, insects and mammals. These may be common and widespread, with no rare or uncommon species recorded in this survey, but locally it is potentially an important area. It also provides a good resource for the school, as a place to study wildlife.

The area could be made better for wildlife, which would also improve its role as an educational resource. It is necessary to manage a site of this nature, to balance the needs of access and safety with the needs of wildlife. Most important when managing a site with its wildlife in mind is not to over-manage.

Some areas of grassland and woodland plants should be left uncut, such that at any time of the year there is always some cover for wildlife. If needs be, problem species (e.g.. large stands of nettles) should be removed while other stands or groups of plants are left to provide a source of nectar, pollen or seeds for insects and birds. The site could be enhanced, by planting species that provide additional sources of food (e.g.. nectar or seeds) for insects and other animals. The best plants would be those that already grow in and around Radley, and thus are suited to the local conditions, eg the soil type.

Trees are large dominant plants and care needs to taken that they do not overly dominate the site to the detriment of the other habitats present. Some trees could be coppiced (cut at their base and allowed to re-grow), which would provide a more varied woodland structure. The wood and branches of these coppiced trees could be stacked to provide additional habitat for animals to hide in. The pond dipping platform is overgrown by the adjacent medium size willow, and it would be advisable to coppice this tree to improve access to the dipping platform and reduce the shading on this part of the pond. The small willow saplings in the pond should be removed (pulled out) otherwise they too will grow and shade the pond too much. The large willow in the farthest corner of the pond should be left as it is, the shady open water underneath it is positive feature of the pond and part of the variety of aquatic habitats present. It is a fine tree in its own right.

The large number of fish, are the biggest problem for the pond and its associated aquatic wildlife. To maximise the wildlife potential of the pond the large fish would have to be removed. Sticklebacks and other pond animals can co-exist more happily, but even these will mean some species will not be

as abundant as they could be, e.g. dragonflies, damselflies and newts. The removal of the large fish would allow the establishment of more aquatic plants, which would provide better conditions for pond animals in general and amphibians in particular.

The probable absence of Great Crested Newts in the pond means there are no legal implications for pond dipping, or the timing of pond management. The recommended time of year for managing ponds with Great Crested Newts is in the autumn or winter, when no adults are present and the young have left. This is also the best time of year, overall, for all major pond management anyway. Thus, because no survey is ever definitive and there was a small or overlooked population of newts, management at this time would not be damaging anyway. The pond actually needs relatively little management (fish removal apart) to maximize its value for wildlife. Some of the taller emergent plants should be removed (approximately one third of the area) along edges of the pond. These cleared areas should then be planted up with low growing emergent plants. Submerged aquatic plants should also be established. Be careful to use only native British plant species - avoid introducing invasive foreign species that can (and will) take over the whole pond.

Once the initial pond work is carried out little management should be required. Retain a large amount of aquatic plants - over half the pond at least. However control species that will grow out and take over the whole pond, e.g. Reed-mace. A good mix of species will provide a mass of plants, with no one species out-competing the others. Maintain a mix of aquatic plants with some open water around the dipping platform. This will create ideal conditions for invertebrates and thus a good area for pond dipping. Pond plants pulled out of the pond should ideally be left on the side of the pond overnight to allow animals to escape back into the pond, before being stacked in habitat piles for terrestrial cover. Ideally, have areas with no access along on edge of the pond about one third of the pond circumference alongside the roadside wall.

The regime suggested is not intensive, and involves only small amounts of work on an irregular basis.

## Appendix I

### Species Recorded on 19 July 2002

W = species found under or in the semi-shaded area of trees

H = species found in hedge

G = species found in open grassy area

P = species found in or around the pond

### Plants - Trees and Shrubs

FIELD MAPLE	<i>Acer campestre</i>	H
NORWAY MAPLE	<i>Acer platanoides</i>	W
SYCAMORE	<i>Acer pseudplatanus</i>	W
SILVER BIRCH	<i>Betula pendula</i>	W
BUDDLIA	<i>Buddleja davidsii</i>	W
HORNBEAM	<i>Carpinus betulinus</i>	W
HAWTHORN	<i>Crataegus monogyna</i>	W, H
ASH	<i>Fraxinus excelsior</i>	W
PLUM	<i>Prunes sp.</i>	H
BLACKTHORN	<i>Prunus spinosa</i>	H
PUSSY WILLOW	<i>Salix caprea</i>	P
CRACK WILLOW	<i>Salix fragilis</i>	P
ELDER	<i>Sambucus nigra</i>	H
SNOWBERRY	<i>Symphoricarpos rivularis</i>	H
GUELDER ROSE	<i>Viburnum opulls</i>	H
DOG ROSE	<i>Rosa canina</i>	H
ROSE	<i>Rosa sp.</i>	W
JAPPONICA		H

### Plants - Herbs

GROUND ELDER	<i>Aegopodium podagraria</i>	P
HEDGE PARSLEY	<i>Anthriscus sylvestris</i>	W
HEDGE BINDWEED	<i>Calysiegia sepium</i>	P
CUCKOO FLOWER	<i>Cardaminn pratensis</i>	Unconfirmed P
CREEPING THISTLE	<i>Cirsium ravens</i>	0
SPEAR THISTLE	<i>Cirsium vulgare</i>	G
SMOOTH HAWKSBEARD	<i>Crepis capillarys</i>	G
HAIRY WILLOWHERB	<i>Epilobium hirsutum</i>	P
HERB ROBERT	<i>Geranium robertianum</i>	P
WOOD AVENS	<i>Geum urbanism</i>	P
IVY	<i>Hedera helix</i>	H
HOGWEED	<i>Heracleum sphondylium</i>	G
STINKING IRIS	<i>Iris foetidissima</i>	W
YELLOW FLAG	<i>Iris pseudacorus</i>	P
HONEYSUCKLE	<i>Lonicera periclymenum</i>	W
WHITE WATER LILY	<i>Nymphaea alba</i>	P
BRISTLY OX-TONGUE	<i>Picris echioides</i>	G
PRIMROSE	<i>Primula vulgaris</i>	W
CREEPING BUTTERCUP	<i>Ranunculus repens</i>	G
BRAMBLE	<i>Rubus fruticosus agg.</i>	W
BROAD LEAFED DOCK	<i>Rumex obtusifolius</i>	G

WOOD DOCK	Rumex sanguineus	H
ARROWHEAD	Sagittaria saggitifolia	P
WATER FIGWORT	Scrophularia auriculata	P
RED CAMPION	Silene dioica	W
WOODY NIGHTSHADE	Solanum dulcamara	P
HEDGE WOUNDWORT	Stachys sylvatica	W
DANDELION	Taraxacum officinale agg.	G
STINGING NETTLE	Urtica dioica	W
COMMON VETCH	Vicia sativa	G

### **Plants - Grasses. Sedges and Rushes**

FALSE OAT GRASS	Arrenantherum elatius	G
FALSE FOX SEDGE	Carex otrubae	P
POND SEDGE	Carex riparia and/or C. acutiformis	P
COCKSFOOT GRASS	Dactylis glomerata	G
GIANT FESCUE GRASS	Festuca gigantea	G
YORKSHIRE FOG GRASS	Holcus linnets	G
HARD RUSH	Juncus inflexus	P
PERENNIEL RYEGRASS	Lolium perenne	G
ROUGH MEADOW GRASS	Poa trivialis	G
COMMON CLUB RUSH	Scfiveavlectus lacustris	P
REED-MACE	Typha latifolia	P

### **Butterflies**

HOLLY BLUE	Celastrina argiolus
LARGE WHITE	Pieris brassicae
GATEKEEPER	Pyronia titmouse
ESSEX SKIPPER	Thymelicus lineola

### **Other Insects**

SCORPION FLY	Panorpis sp.	P
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### **Birds**

CHAFFINCH	Fringilla coelebs
WREN	Troglodytes troglodytes
BLACKBIRD	Turdus merula

### **Pond Invertebrates**

BLUE TAILED DAMSELFLY	Ischnura elegans
LESSER WATER BAOATMAN	Corixia Sp.
WATER BOATMAN	Notonecta sp.
POND SKATER	Gerris sp.
WATER LOUSE	Asellus aquaticus
FRESHWATER SHRIMP	Ganmrarus sp.
GREAT POND SNAIL	Limnaea stagnalis
GREAT RAMSHORN	Planorbis corneus
RAMSHORN	Planorbis planorbis
THREE SPINED STICKLEBACK	Gasterosteus aculeatus

GOLDFISH

*Carassius auratus*





**PARKLEY ROND**

22A - 19/07/02

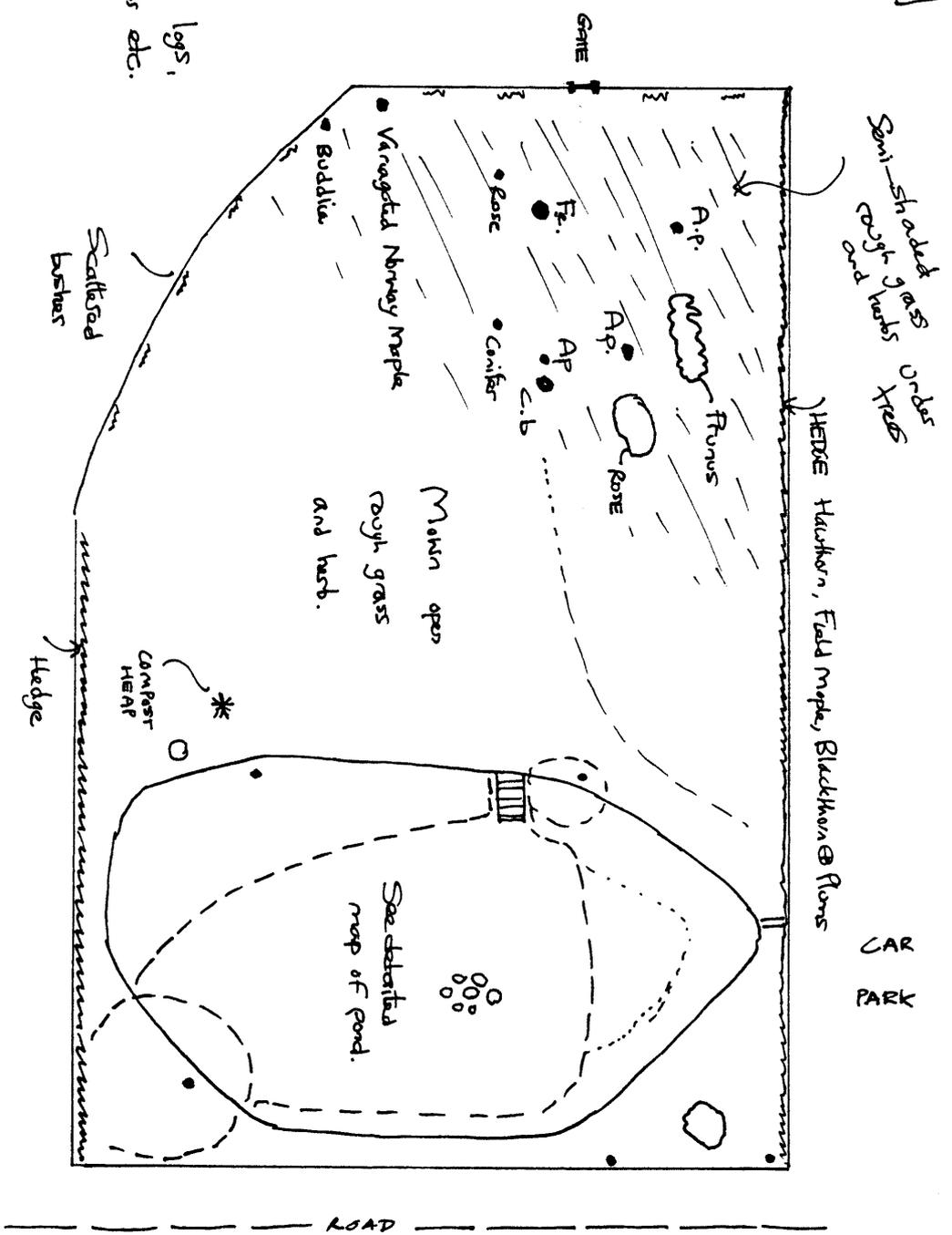
DIAGRAMMATIC

APPROXIMATE SCALE

1 cm = 2 M.

SCHOOL

Scattered logs,  
paving slabs etc.





## KEY TO MAPS

● = TREE

B.p. = *Betula pendula* BIRCH

SF = *Salix fragilis* CRACK WILLOW

Ap = *Acer pseudoplatanus* SYCAMORE

### Pond plants

E.h = *Epilobium hirsutum* HAIRY WILLOWHERB

Ji = *Juncus inflexus* HARD RUSH

C.o. = *Carex otrubae* FALSE FOX SEDGE

Ca/r = *Carex acutiformis* / *repens* POND SEDGE

Sd = *Sclandm tulcamera* WOOD NIGHTSHADE

T.a = *Typha angustifolia* REEDMACE

S.s. = *Sagittaria sagittifolia* ARROWHEAD

S.l. = *Scirpus lacustris* COMMON CLUB-RUSH

I.p = *Iris pseudacorus* YELLOW FLAG

C.s. = *Calystegia sepium* HEDGE BINDWEED

Na = *Nymphaea alba* WHITE WATER LILY

Sa = *Sagittaria auriculata* WATER FIG-WORT

## **Appendix 3: Management Recommendations**

### **General notes**

The management recommendations are broken down by habitats, or other type of work - and then into individual detailed tasks for these specific habitats or type of work. Tasks are either ongoing jobs to be carried out on a regular basis, annual or otherwise - or they are capital tasks, i.e. one-off jobs. Each task has been scheduled for a specific time of year, with work staggered throughout the year.

The management areas are shown on the Detailed Management Proposals map.

### **Paths**

Maintain paths for access and open area of short grass for educational activities.

- Cut paths and central open area as often as required - from the access gate, to the pond and around two thirds of the pond edge.

### **Grassland**

The grassland management is designed to create a variety turf heights and cutting times to accommodate a variety of species and maintain paths and shorter areas for educational use. All cut material should be picked up and stacked on site on the nearest habitat pile.

- Cut one area of grassland once a year in April.
- Cut two areas of grassland once a year in August.
- The two edge blocks are cut on a two year cycle, to provide tall cover for invertebrates and small mammals in the winter. Cut half of each strip in August.
- Leave narrow edge strips alongside the boundary fence and hedges uncut. Once these long areas are well established (leave for at least two years) cut on an irregular basis, always leaving some uncut sections as over-wintering habitat.

### **Woodland**

Maintain a diverse structure, including standard trees, coppice and a woodland herb layer. Cut material stacked as habitat piles.

- Diversify the structure of the trees by coppicing two or three trees (marked on the map). Re-coppice the trees on a staggered cycle of about 6 years. Coppicing should be carried in the autumn or winter.
- Leave some areas of ground cover uncut and allow them to thicken up to provide good cover.
- Cut two areas of ground cover (one either side of the entrance gate) every year in September.
- Leave narrow strips alongside the fences and hedges uncut.

### **Pond**

Maintain and improve the diversity of aquatic habitats in and around the edges of the pond.

### **Capital tasks.**

- Create undisturbed pond edge by reducing access around the pond, leaving one third of the pond margin uncut. The existing path through this uncut margin may need to be temporarily, or permanently blocked to discourage access.
- Coppice Willow tree adjacent to the pond dipping platform, and cut back on a regular basis to maintain it as low coppice.

- Remove (pull out) the two small willows from pond margins, in the autumn or winter.
- Remove all the large Goldfish, having found a suitable alternative place to take them to. It will not be possible to remove the Sticklebacks. If the large fish are not removed it will be difficult to achieve the aim of creating a better wildlife pond. The two following tasks are probably dependent upon the fish being removed.
- Clear five patches of tall emergent plants along one edge of the pond. Once cleared, plant up with a mix of suitable native low growing emergent plants e.g. Water Mint, Water Forget-me-not, Brooklime etc. Also plant up the edge of the pond, along the roadside wall. This work should be carried out in the autumn or winter.
- Introduce suitable native submerged aquatic plants into the open water areas of the pond, e.g. Hornwort and Water Milfoil.

### **Ongoing tasks.**

- Control invasive plants, e.g. tall aquatics such as Reed-mace, as required (autumn or winter).
- Maintain pond with aquatic vegetation cover of over at least half the pond surface, ideally more.
- Maintain a mix of vegetation and some open water around the dipping platform, to maximise the number of species of animal that are likely to be caught.
- Water levels in ponds fluctuate naturally, and there is no need to keep the pond topped up. The falling water level creates areas of bare mud in which many pond plants and animals are found and depend. The area, between high and low water levels, is called the drawdown zone.

### **Recording**

- Making records of the birds, animals, insects and plants that are found in, or use the area, will help to gauge the success of the management aims and be an interesting project in its own right.
- Any problem species can be identified, and controlled as required. For example large stands of nettles would be undesirable in such a small area especially since it is also used for educational purposes. A small patch in the right place will provide a valuable food plant for many invertebrates.
- Introducing other species, if desirable or required, is best done with the knowledge of what already grows on site. This information may also give an idea of other species that may also grow. It is best not to introduce anything until the management plan has been carried out for at least two years, to give time for a survey of the species present to be made and the nature of the habitats to be established.

### **Other Tasks**

- Cut and kill (to prevent it from re growing and damaging the wall further) the small Sycamore growing out of roadside wall. Anytime of year.
- The boundary hedges will need to be cut back, but no more often than every second or third year. Cut only part (half at most) of the total length of hedge at any time, in late autumn.
- Remember, all cut material can be stacked on site as permanent habitat piles, situated in convenient positions adjacent to the main management areas. There are six suggested locations on the map, which, or may not, all be needed.