



Former Mepal
Outdoor Centre,
A142 Ireton's
Way, Ely,
Cambridgeshire

Botanical Survey Report

September
2020



Ref: 19-6364

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<i>Revision</i>	-
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1. Site description



Site map (source: OpenStreetMap)

Surface geological mapping by the British Geological Survey shows that the site is situated on Quaternary deposits, with peat overlying Holocene river terrace sands and gravels. These sands and gravels have been extracted to form a lake, which takes up around half the site, mostly in the north. The other half comprises now derelict buildings, a car park and areas of open sand and gravel. Much of the margins of the site are vegetated, with planted shrubs along the margin next to the A142. It is part of the Mepal Gravel Pits County Wildlife Site (CWS) and was described by the Wildlife Trust in a 2005 survey that was carried out in July:

On the western side of the main road (A142) is a smaller pit that also holds clear water. Submerged vegetation appears to be very sparse and floating vegetation is almost entirely absent; such species include *Elodea canadensis* (Canadian Waterweed) and *Potamogeton perfoliatus* (Perfoliate Pondweed). A narrow intermittent fringe of marginal vegetation is present along the majority of the shore, particularly along the western and southeastern sides of the lake. Flora includes *Phragmites australis* (Common Reed), *Lycopus europaeus* (Gipsywort), *Epilobium hirsutum* (Great Willowherb), *Scrophularia auriculata* (Water Figwort), *Lythrum salicaria* (Purple Loosestrife), *Eupatorium cannabinum* (Hemp Agrimony), *Juncus articulatus* (Jointed Rush), *Samolus valerandi* (Brookweed), *Myosotis scorpioides* (Water Forget-me-not), *Cyperus longus* (Galingale) (probably introduced). In the south-western corner of the lake *Typha angustifolia* (Lesser Bulrush) is locally abundant. The western side of the lake is backed by steep banks dominated by mature *Salix alba* (White Willow) and *Crataegus monogyna* (Hawthorn). At the southeast corner of the lake is an area well used for outdoor activities. Habitats include disturbed and species-poor grassland, bare ground and ephemeral vegetation on sandy soil, a large sand heap, a small area of Willow/Birch woodland on damp ground. A small part of the shoreline here is composed of an unvegetated sand and gravel beach.

The site (comprising the pits on both the west and east side of the A142) qualifies as a County Wildlife Site because it contains a water body supporting at least three species of pondweed (*Potamogeton spp.*) and because it supports a population of a Nationally Scarce vascular plant species, *Potamogeton trichoides* (Hairlike Pondweed).



Looking south from the reed fringed northern end

In the assessment, the *Elodea canadensis* was probably a misidentification of the similar *E. nuttallii* (Nuttall's Waterweed), which was present in this survey. Although Nationally Scarce, *Potamogeton trichoides* is relatively common in Cambridgeshire, but is included in the county Register of Plants of Conservation Concern (RPCC) as it is in decline in England. *Potamogeton perfoliatus* is in decline in England and it is listed with a threat status of county Vulnerable in the RPCC.

Until recently, the site was run as Mepal Outdoor Centre, providing adventurous activities for young people, but following its closure after an arson attack there has been much vandalism. There is unauthorised access to the site, with anglers appreciating fishing for the large carp that live in the lake and travelling long distances to do so. When these were introduced is not clear, as such fish are often detrimental to other wildlife. The fishermen reported the probable presence of Otter. Many areas in the south of the site are kept open by Rabbit grazing, though this is often detrimental to some plants.



Site map with OS grid (Cucuera OSM)

2. Survey Practice

Surveys for vascular plants and charophytes were carried out on 2020 April 9, May 19, July 7 and September 1. The site was divided into two main halves: the northern monad in TL4283 and the southern monad in TL4282, with each monad recorded separately. The north-western fringe of the site is in TL4183 and this was not accessed on the first visit. The entire site was walked through, covering as much ground as possible and the plant species recorded. The early spring visit allowed discovery of early flowering species that had not previously been recorded from the area. On the July and September visits, waders were used to access the shallower lake waters, with a grapnel used to dredge samples from deeper waters close to the shore. Although the survey has been thorough and comprehensive, some plants will have been missed. Some species are very ephemeral, others may not appear every year and it was impossible to cover every square metre of the site. In the written report nomenclature follows Stace IV (2019), but the electronic species lists and Appendix use Stace III (2010).

In total 276 plant species and subspecies have been recorded from the site and these are listed in the annotated Appendix, together with a few casual records of other taxa. The detailed records from the survey have been supplied separately in digital form.

3. Notable Species



Little Mouse-ear, Early Forget-me-not and Biting Stonecrop on sandy ground near the site entrance.

Anthriscus caucalis (Bur Chervil). This plant is listed in the RPCC as it is Vulnerable in Cambridgeshire having apparently been lost from a number of sites. This was one of them, with the plant not having been seen since 1975. It is particularly widespread at the south-western end of the site. It is a weak indicator of acidic grassland. Noted on the April visit and gone by the summer.

Carduus tenuiflorus (Slender Thistle). Currently recognised as a scarce plant in the county, but seemingly on the increase. There was a scattered population on the north-west bank on the May visit, with a larger population on a farm bund on the other side of the surrounding track.

Cerastium diffusum (Sea Mouse-ear). A rare and possibly declining species in the county, though new sites are being found. There was a small group of plants on the edge of one of the sand pits by the Outdoor Centre. This had sand of a different nature to that of the surrounding gravel, so could have been imported sea sand. The plant is also known from nearby Block Fen. Noted on the May visit and gone by the summer.

Cerastium semidecandrum (Little Mouse-ear). A spring flowering annual of dry, often sandy ground, this was a new hectad record. Plants were scattered across the site. It is a strong indicator of acidic grassland. Noted on the April visit and gone by the summer.

Chara hispida (Bristly Stonewort). On the July visit there were extensive stands of this stonewort in the shallower waters of the southern part of the lake. It is listed in the RPCC as county vulnerable due to a significant decline in monad occupancy.



Left: Common Stork's-bill, Right: Dune Stork's-bill

Chenopodium hybridum (Maple-leaved Goosefoot). About a dozen plants were on the bank surrounding the site on the September visit. It is relatively common in the county, but it is thought to be in decline in England, hence it is included in the RPCC.

Cyperus longus (Galingale). There were a couple of patches on the southern shores of the lake, one possibly arising by self-sowing from the other, presumably introduced population. It is an alien species in Cambridgeshire, having first been recorded here in 1975. It is included in the RPCC as it is Near Threatened in England.

Erodium cicutarium subsp. dunense (Dune Stork's-bill). This subspecies is scattered in the flat, sandy southern area. It has smaller, paler petals than the common form. It is very rare in the county, with only one other site, which was an area of ground made good with Breckland infill. It is more often associated with coastal habitats and although Sell & Murrell associate it with the Brecks, there is only one record from there in the BSBI DDB. Microscopic determination of the mericarp was required to distinguish the plant from the similar *E. lebelii*.

Filago germanica (Common Cudweed). The plant lives up to its English name in Cambridgeshire and has perhaps become more common over the last 20 years. In England as a whole it is in decline and is listed as Near Threatened. It was mostly present around the car park gravels, with a few plants along dry track margins.

Fragaria vesca (Wild Strawberry). Plants were noted in the southern part of the site, mostly around the car park area and adventure playground. Although common in the county as a whole, it is quite uncommon in the Fens and these were the first hectad records. It is listed in the RPCC because it is Near Threatened in England.

Galium palustre (Marsh-bedstraw). This plant was seen during a brief visit to the site in 2018. It is county Vulnerable due to a decline in occupancy. It could still be present in the area of the southern beach.

Mentha arvensis (Corn Mint). There was a patch of the plants on the margin of one of the more open bays on the south-east side of the lake. Still relatively common in Cambridgeshire, it is Near Threatened in England. The plant is most readily identified from mid-summer onwards.

Myosotis ramossissima (Early Forget-me-not). Another spring flowering annual of dry, often sandy ground, this was also a new hectad record. The plant was widespread in bare sandy areas across the site. It is a weak indicator of acidic grassland. Noted on the April visit and gone by summer.

Nitella flexilis agg (Smooth Stonewort). I found strands of the plant at one of the fishing points on the west side of the lake on the July visit. They had presumably been dragged out from deep water. It was not fertile, so impossible to determine to species. *Nitella flexilis s.s.* is Nationally Scarce, however *Nitella opaca* (Dark Stonewort) is more frequent. Both species (and the aggregate) are county rare. The aggregate was reported from the eastern pit in 1977.

Ophrys apifera (Bee Orchid). This orchid is spreading northwards, historically being less common in the Fens. It was present in the unusual habitat of a bark-chipping bed at the site, in addition to more usual situations. Rosettes were noted on the April visit, with seed heads seen in July.



Bee Orchid rosettes in a bark chipping bed

Polypogon monspeliensis (Annual Beard-grass). Flowering plants were scattered along the shore-line of the gently sloping south-east beach on the July visit. Although currently with a Nationally Scarce status for Great Britain, it has become much more common as a ruderal species since the GB list was compiled.

Potamogeton crispus (Curled Pondweed). Mostly found around the northern margins of the lake on the July visit. Although still common in both the county and England the plant is in decline at county level and hence is listed as Vulnerable in the RPCC.

Potamogeton perfoliatus (Perfoliate Pondweed). Two small plants were found in shallower water near the south-east lake margin on the July visit. By the September visit the number of plants had increased substantially, though all were small. Although still common in both the county and England the plant is in decline at both England and county level and is listed as Vulnerable in the RPCC.

Taraxacum glauciniforme (A Dandelion). Dandelions are rarely recorded to species level, but this is a quite distinctive species of open sandy ground. It is currently listed as county rare in the RPCC, but may be present more widely.

Typha angustifolia (Lesser Bulrush) was listed in a previous edition of the RPCC, and whilst still slightly in decline in the county this is no longer sufficient to warrant its inclusion in the Register. One threat to it could be hybridisation with *T. latifolia* (Bulrush), which is also present on the lake margin.

4. Invasive Species

An appendix to the RPCC added in 2020 lists a number of plants that are a concern because they are invasive and have the potential to, or are, causing damage to wildlife sites. Several of these are present at the Mepal site. Some common species such as *Urtica dioica* (Nettle) and *Rubus fruticosus* agg. (Bramble) are not specifically listed in the RPCC, but are never-the-less threats to grassland and other open sites. The notifiable weeds *Cirsium arvense* (Creeping Thistle), *Cirsium vulgare* (Spear Thistle), *Rumex crispus* (Curled Dock), *Rumex obtusifolius* (Broad-leaved Dock) and *Jacobaea vulgaris* (Common Ragwort) are all present on the site.

Conium maculatum (Hemlock). There is a significant population on the banks around the site, particularly at the south end and adjacent to the A142. It can become dominant and will shade out other species.



A forest of Common Teasel in the southern part of the site

Dipsacus fullonum (Common Teasel). Teasel provides a nectar source for insects in summer and a winter food source for birds through its seed heads. It can however form dense, impenetrable stands, which shade out all other vegetation. Stands are developing in the southern part of the site.

Lepidium draba (Hoary Cress). This plant spreads through underground rhizomes and can form large patches, where it out-competes smaller plants. It is extensive along parts of the margin with the A142.

Medicago arabica (Spotted Medick). Whilst the Medick makes an attractive garden plant, it is currently expanding its range into the wider countryside. It has the potential to form dense patches. It is present in the southern part of the site, but is kept under control by Rabbits.

Pentaglottis sempervirens (Green Alkanet). A garden plant that is almost impossible to eradicate due to its buried tubers. It thrives in slightly shaded locations and can create very dense patches. At the moment there are only scattered plants across the site.

5. Important Plant Areas



Important emergent and land plant areas (map source: OpenStreetMap)

Three broad areas are important for the more notable plant species.

The lake body

The range of water depths provides habitat for species of both shallow and deep water, though the deepest waters were not accessible. It supports pondweed and stonewort species of county significance. The water appears to be of high quality and this may be a consequence of the large fish being of “English” origin according to the fishermen. These fish are slow growing and may not disturb the bottom as much as is seen in many fisheries stocked with fast growing fish.

The lake margin

The lake margins shelf rapidly in most places, though the gradient is gentler at the southern beach. This means that the effects of summer draw-down are only really seen in this beach area. Reed growth and over-shadowing scrub is swamping emergent vegetation in most of the rest of the site. The significant plants are therefore mostly seen in the beach area, though with appropriate management other areas would become suitable. Areas B, C and D are particularly important. B is the gently shelving beach, C is off an old jetty where Perfoliate Pondweed grows, D has Corn Mint.

Open sandy areas

The site is probably most important for the unusual plants that grow on the poorly vegetated and bare sandy areas in the south of the site. These are mostly spring annuals, though Dune Stork’s-bill has a much longer flowering season and is the most significant plant on the site. A and F are the most important areas for spring annuals and Dune Stork’s-bill. E is an area with Wild Strawberry.

6. Site Assessment

The present CWS assessment uses guidelines written in 1989, with subsequent minor modification. They are not well suited to take into account the degradation of habitats that has occurred since then and many sites that would not have been considered in 1990 may be worth consideration today. Revised criteria for site selection are under consideration.

The 2005 designation of Mepal Gravel Pits as a County Wildlife Site was based entirely on the presence of three or more species of Potamogeton. Only one of these was present in the Mepal Outdoor Centre pit at the time and it is clear that the eastern pit was the primary one in achieving the designation. Alternative botanical criteria under the existing guidelines for selection would be either Acidic Grassland or Standing Water Bodies. What constitutes a good acidic grassland site in Cambridgeshire is not well defined in the guidelines as it is a rare habitat. The open sandy areas are not grassland in the strict sense of NVC U1, which the guidelines use, however they do support a number of strong and weak indicators for the habitat, including *Festuca ovina agg* (Sheep’s Fescue). Standing Water Bodies is a broad classification and the guidelines suggest that most gravel pits will fall into classification 10A, though they do not list the species that would contribute to the 15 species required for designation. The survey found over 25 vascular plant and stonewort species that are submerged, floating or emergent, and on this basis the Mepal Outdoor Centre site clearly qualifies as a CWS in its own right.

It is unfortunately too early to assess the site using new botanical criteria for site assessment that I am developing. One technique is to use the concept of “axiophytes”, species that are neither very common nor very rare and indicate good habitats. Those on the site are noted in the Appendix. Using this system both the eastern and western parts of the original CWS reach similar counts of such species. At 33 species, which includes some that are planted, the axiophyte count is relatively low compared to sites in the southern part of the county, however it needs to be taken in the context of Fenland. Fenland as a whole is a species poor region, so natural areas become much more important. Another technique would be to use a scoring system, rating rarer plants worthy of a higher score than plants that are more common. A third technique would be to consider the broad value of the habitat, rather than what it actually contains. Open sandy ground is generally rare in the county, so this is an important habitat.

There are a large number of planted and introduced ornamental species on the site. Some of these are becoming established, mainly by vegetative reproduction. Planted species are particularly noticeable along the road boundary and around the buildings of the old Outdoor Centre.

The site could undoubtedly be improved for those species of botanical interest, however this might degrade its value for birds or invertebrates. I saw little evidence that the fishing activities were having a negative influence on the botany, and to an extent some activity is positive in keeping paths and fishing runs open. One option would be to introduce licensed fishing on the west side of the lake, enhancing the swims by providing better access, with some clearance of scrub and other vegetation surrounding them. This could provide more habitat for some emergent species that are otherwise scarce on the site. Another option would be to construct a circular nature walk along the north-eastern lake shore and returning along the higher ground. Again, this will benefit less aggressive emergent vegetation along the lake. The higher ground is more nutrient rich and will require some management of the Nettles and perhaps a new bank to reduce traffic noise.

Some thought needs to be given to the control of invasive plant species, which may otherwise swamp those that are more desirable to have on site. Some of these (for example Common Teasel) can be important seed sources for birds, so a balance will need to be struck.

7. Conclusion

Overall, the site is maturing, with the development of stands of scrub and other dense vegetation. Most of the important plant species however require a less mature, more open habitat, so for these the clock needs to be reset.

The marginal habitat around the lake, the lake itself and the open sandy areas are the most important parts of the site from the botanical perspective. The open sandy areas support seven species of county significance, whilst the lake and its margins support six. It is clearly worth retaining the CWS designation for the Mepal Outdoor Centre part of the overall Mepal Gravel Pits CWS. The part of the site set aside for wildlife will need protection from unauthorised disturbance by use of suitable fencing.

It will be important to put effective management plans into practice for the site. In particular, these will need to focus on maintaining areas of bare or lightly vegetated sandy ground and ensuring that emergent vegetation is not overwhelmed by reed growth. It will also be important to continue regular monitoring of the site to make sure that the management is having the desired effect and to change it if necessary. Ideally, the monitoring should be on a quick look basis every three or four years, with a more comprehensive survey every decade.

Looking further ahead a vision for the region could be to develop the complex of gravel pits in the area as a large site for wildlife and people by creating a mosaic of habitat. Significant areas should be kept entirely for wildlife, but others made available for recreational use to enjoy the wildlife, and for water-sports, off road cycling and other pastimes. The Mepal Outdoor Centre would be part of this larger complex.

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Appendix I

Vascular plants, charophytes and other species from Mepal Outdoor Centre

The following list includes records made during a visit by Nick Millar of the Wildlife Trust in 1996, a brief visit by myself in 2018 and visits during the present survey. Unfortunately, the Wildlife Trust survey in 2005 did not distinguish between the two halves of the existing CWS, so their records are not included. The detailed records are provided separately in digital form.

Taxon	Vernacular	First Recorded	Last Recorded	Status/Notes
<i>Acer campestre</i>	Field Maple	1996	2020	
<i>Acer pseudoplatanus</i>	Sycamore	2020	2020	
<i>Achillea millefolium</i>	Yarrow	2020	2020	
<i>Aegopodium podagraria</i>	Ground-elder	2020	2020	
<i>Aesculus hippocastanum</i>	Horse-chestnut	2018	2020	
<i>Agrimonia eupatoria</i>	Agrimony	2020	2020	
<i>Agrostis stolonifera</i>	Creeping Bent	2020	2020	
<i>Alliaria petiolata</i>	Garlic Mustard	2020	2020	
<i>Alnus incana</i>	Grey Alder	2018	2020	
<i>Amaranthus hybridus</i>	Green Amaranth	2020	2020	
<i>Anagallis arvensis</i>	Scarlet Pimpernel	2020	2020	
<i>Anisantha sterilis</i>	Barren Brome	2020	2020	
<i>Anthriscus caucalis</i>	Bur Chervil	2020	2020	Declining in England and County Vulnerable.
<i>Anthriscus sylvestris</i>	Cow Parsley	1996	2020	
<i>Aphanes arvensis</i>	Parsley-piert	2020	2020	
<i>Aquilegia vulgaris</i>	Columbine	2020	2020	Axiophyte.
<i>Arctium minus</i>	Lesser Burdock	2020	2020	The Arctium subspecies form a broad range at the site.
<i>Arctium minus subsp. minus</i>	Lesser Burdock	2020	2020	
<i>Arctium minus subsp. pubens</i>	Lesser Burdock	2020	2020	
<i>Arenaria leptoclados</i>	Slender Sandwort	2018	2020	Declining in England. Common in county.

<i>Arenaria serpyllifolia</i> agg.	Thyme-leaved Sandwort	1996	1996	Probably A. leptoclados.
<i>Armoracia rusticana</i>	Horse-radish	2020	2020	
<i>Arrhenatherum elatius</i>	False Oat-Grass	2020	2020	
<i>Artemisia vulgaris</i>	Mugwort	2020	2020	
<i>Arum maculatum</i>	Lords-and-Ladies	2020	2020	
<i>Asparagus officinalis</i>	Garden Asparagus	2020	2020	Axiophyte.
<i>Atriplex prostrata</i>	Spear-leaved Orache	2020	2020	
<i>Ballota nigra</i>	Black Horehound	2020	2020	
<i>Barbarea vulgaris</i>	Winter-cress	2020	2020	
<i>Bellis perennis</i>	Daisy	2020	2020	
<i>Betula pendula</i>	Silver Birch	2020	2020	
<i>Betula pubescens</i>	Downy Birch	2020	2020	Axiophyte.
<i>Borago officinalis</i>	Borage	2020	2020	Axiophyte.
<i>Bromus hordeaceus</i>	Soft-brome	2020	2020	
<i>Bryonia dioica</i>	White Bryony	2020	2020	
<i>Buddleja davidii</i>	Butterfly-bush	2020	2020	Invasive potential.
<i>Buxus sempervirens</i>	Box	2020	2020	Planted.
<i>Calamagrostis epigejos</i>	Wood Small-reed	2020	2020	
<i>Calystegia sepium</i> subsp. <i>sepium</i>	Hedge Bindweed	2020	2020	
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	2020	2020	
<i>Cardamine hirsuta</i>	Hairy Bitter-cress	2020	2020	
<i>Carduus crispus</i>	Wetted Thistle	2020	2020	
<i>Carduus tenuiflorus</i>	Slender Thistle	2020	2020	County scarce but increasing.
<i>Carex hirta</i>	Hairy Sedge	2020	2020	
<i>Carex otrubae</i>	False Fox-sedge	2020	2020	
<i>Carpinus betulus</i>	Hornbeam	2020	2020	Planted.
<i>Cerastium diffusum</i>	Sea Mouse-ear	2020	2020	County rare and Vulnerable
<i>Cerastium fontanum</i>	Common Mouse-ear	2020	2020	
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	2020	2020	
<i>Cerastium semidecandrum</i>	Little Mouse-ear	2020	2020	Axiophyte.
<i>Chaerophyllum temulum</i>	Rough Chervil	2020	2020	
<i>Chamerion angustifolium</i>	Rosebay Willowherb	1996	2020	Invasive.

<i>Chara hispida</i>	Bristly Stonewort	2020	2020	Axiophyte. County Vulnerable.
<i>Chenopodium album</i>	Fat-hen	2020	2020	
<i>Chenopodium ficifolium</i>	Fig-leaved Goosefoot	2020	2020	
<i>Chenopodium hybridum</i>	Maple-leaved Goosefoot	2020	2020	Axiophyte. Declining in England
<i>Chenopodium polyspermum</i>	Many-seeded Goosefoot	2020	2020	
<i>Chenopodium rubrum</i>	Red Goosefoot	2020	2020	
<i>Choisya ternata</i>	Mexican Orange	2020	2020	Planted
<i>Cirsium arvense</i>	Creeping Thistle	1996	2020	
<i>Cirsium vulgare</i>	Spear Thistle	2020	2020	
<i>Clematis vitalba</i>	Traveller's-joy	2020	2020	Invasive potential.
<i>Colchicum varieagatum</i>	An Autumn Crocus	2020	2020	Planted.
<i>Conium maculatum</i>	Hemlock	2020	2020	Invasive.
<i>Convolvulus arvensis</i>	Field Bindweed	2020	2020	
<i>Conyza canadensis</i>	Canadian Fleabane	2020	2020	
<i>Conyza sumatrensis</i>	Guernsey Fleabane	2020	2020	
<i>Cornus sanguinea subsp. australis</i>	Dogwood	2020	2020	
<i>Cornus sericea</i>	Red-osier Dogwood	2020	2020	Planted.
<i>Corylus avellana</i>	Hazel	2020	2020	
<i>Crataegus heterophylla</i>	Various-leaved Hawthorn	2018	2018	
<i>Crataegus monogyna</i>	Hawthorn	1996	2020	
<i>Crepis capillaris</i>	Smooth Hawk's-beard	2018	2020	
<i>Crepis vesicaria</i>	Beaked Hawk's-beard	2020	2020	
<i>Cyperus longus</i>	Galingale	1996	2020	GB Near Threatened. Axiophyte. Introduced here.
<i>Cytisus scoparius</i>	Broom	2020	2020	Axiophyte. Probably planted
<i>Dactylis glomerata</i>	Cock's-foot	2020	2020	
<i>Dipsacus fullonum</i>	Wild Teasel	2020	2020	Invasive.
<i>Dryopteris dilatata</i>	Broad Buckler-fern	2020	2020	Axiophyte.
<i>Echium vulgare</i>	Viper's-bugloss	2020	2020	Axiophyte.

<i>Elodea nuttallii</i>	Nuttall's Waterweed	2020	2020	
<i>Elytrigia repens</i>	Common Couch	1996	1996	
<i>Epilobium ciliatum</i>	American Willowherb	2020	2020	
<i>Epilobium hirsutum</i>	Great Willowherb	2020	2020	
<i>Epilobium parviflorum</i>	Hoary Willowherb	2020	2020	
<i>Epilobium tetragonum</i>	Square-stalked Willowherb	2020	2020	
<i>Equisetum arvense</i>	Field Horsetail	2020	2020	
<i>Erodium cicutarium subsp. cicutarium</i>	Common Stork's-bill	2020	2020	
<i>Erodium cicutarium subsp. dunense</i>	Dune Stork's-bill	2020	2020	County Rare.
<i>Erophila verna</i>	Common Whitlowgrass	2020	2020	
<i>Eupatorium cannabinum</i>	Hemp-agrimony	1996	2020	
<i>Euphorbia helioscopia</i>	Sun Spurge	2020	2020	
<i>Euphorbia lathyris</i>	Caper Spurge	2020	2020	
<i>Euphorbia peplus</i>	Petty Spurge	2020	2020	
<i>Festuca ovina agg.</i>	Sheep's-fescue	2018	2018	Axiophyte.
<i>Festuca rubra agg.</i>	Red Fescue	2020	2020	
<i>Ficaria verna subsp. verna</i>	Lesser Celandine	2020	2020	
<i>Filago vulgaris</i>	Common Cudweed	2020	2020	GB Near Threatened. Axiophyte.
<i>Forsythia x intermedia</i>	Forsythia	2020	2020	Planted.
<i>Fragaria vesca</i>	Wild Strawberry	2020	2020	England Near Threatened. Axiophyte.
<i>Fraxinus excelsior</i>	Ash	2020	2020	Europe Near Threatened.
<i>Fumaria officinalis</i>	Common Fumitory	2020	2020	
<i>Galanthus elwesii</i>	Greater Snowdrop	2020	2020	Planted.
<i>Galanthus nivalis</i>	Snowdrop	2020	2020	Planted.
<i>Galium aparine</i>	Cleavers	2020	2020	
<i>Galium palustre</i>	Marsh-bedstraw	2018	2018	County vulnerable. Axiophyte.
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill	2020	2020	
<i>Geranium molle</i>	Dove's-foot Crane's-bill	2020	2020	

<i>Geranium pusillum</i>	Small-flowered Crane's-bill	2020	2020	
<i>Geranium robertianum</i>	Herb-Robert	2020	2020	
<i>Geum urbanum</i>	Wood Avens	2018	2020	
<i>Glechoma hederacea</i>	Ground-ivy	2020	2020	
<i>Helminthotheca echioides</i>	Bristly Oxtongue	2020	2020	
<i>Heracleum sphondylium</i>	Hogweed	2020	2020	
<i>Hesperis matronalis</i>	Dame's-violet	2020	2020	Axiophyte.
<i>Holcus lanatus</i>	Yorkshire-fog	2020	2020	
<i>Hordeum murinum</i>	Wall Barley	2020	2020	
<i>Hyacinthoides non-scripta</i>	Bluebell	2020	2020	Axiophyte. Planted.
<i>Hyacinthoides x massartiana</i>	Hybrid Bluebell (H. non-scripta x hispanica)	2020	2020	Planted.
<i>Hyacinthus orientalis</i>	Hyacinth	2020	2020	Planted.
<i>Hypericum androsaemum</i>	Tutsan	2020	2020	
<i>Hypericum perforatum</i>	Perforate St John's-wort	2020	2020	
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort	2020	2020	Axiophyte.
<i>Hypericum x inodorum</i>	Tall Tutsan (H. androsaemum x hircinum)	2020	2020	Probably planted.
<i>Inula conyzae</i>	Ploughman's-spikenard	1996	2020	Axiophyte.
<i>Iris foetidissima</i>	Stinking Iris	2020	2020	
<i>Iris germanica</i>	Bearded Iris	2020	2020	Planted.
<i>Juncus articulatus</i>	Jointed Rush	1996	2020	
<i>Juncus bufonius</i>	Toad Rush	2018	2020	Axiophyte.
<i>Juncus effusus</i>	Soft-rush	2020	2020	
<i>Juncus inflexus</i>	Hard Rush	2020	2020	
<i>Laburnum anagyroides</i>	Laburnum	2020	2020	Planted.
<i>Lactuca serriola</i>	Prickly Lettuce	2020	2020	
<i>Lactuca virosa</i>	Great Lettuce	2020	2020	
<i>Lamium album</i>	White Dead-nettle	2020	2020	
<i>Lamium purpureum</i>	Red Dead-nettle	2020	2020	
<i>Lemna trisulca</i>	Ivy-leaved Duckweed	2020	2020	
<i>Lepidium coronopus</i>	Swine-cress	2020	2020	
<i>Lepidium didymum</i>	Lesser Swine-cress	2020	2020	
<i>Lepidium draba</i>	Hoary Cress	2020	2020	Invasive.
<i>Leucanthemum vulgare</i>	Oxeye Daisy	2020	2020	

<i>Leucojum aestivum</i>	Summer Snowflake	2020	2020	Planted.
<i>Linaria vulgaris</i>	Common Toadflax	2020	2020	
<i>Lolium perenne</i>	Perennial Ryegrass	2020	2020	
<i>Lonicera periclymenum</i>	Honeysuckle	1996	2020	Axiophyte. Planted.
<i>Lonicera pileata</i>	Box-leaved Honeysuckle	2020	2020	Planted.
<i>Lonicera x italica</i>	L. caprifolium x etrusca	2020	2020	
<i>Lycopus europaeus</i>	Gypsywort	1996	2020	
<i>Lythrum salicaria</i>	Purple-loosestrife	2020	2020	
<i>Malva moschata</i>	Musk-mallow	2020	2020	Axiophyte.
<i>Malva neglecta</i>	Dwarf Mallow	2020	2020	
<i>Malva sylvestris</i>	Common Mallow	2020	2020	
<i>Matricaria discoidea</i>	Pineappleweed	2020	2020	
<i>Medicago arabica</i>	Spotted Medick	2020	2020	Invasive potential.
<i>Medicago lupulina</i>	Black Medick	2020	2020	
<i>Mentha aquatica</i>	Water Mint	2020	2020	
<i>Mentha arvensis</i>	Corn Mint	2020	2020	Near Threatened in England. Axiophyte.
<i>Mercurialis annua</i>	Annual Mercury	2020	2020	
<i>Myosotis arvensis</i>	Field Forget-me-not	2020	2020	
<i>Myosotis laxa</i>	Tufted Forget-me-not	2018	2020	Axiophyte.
<i>Myosotis ramosissima</i>	Early Forget-me-not	2020	2020	Axiophyte.
<i>Narcissus agg.</i>	Cultivated Daffodil	2020	2020	Planted.
<i>Narcissus poeticus</i>	Pheasant's-eye Daffodil	2020	2020	Planted.
<i>Narcissus x medioluteus</i>	N. poeticus x tazetta	2020	2020	Planted.
<i>Nitella flexilis sens. lat.</i>	Smooth Stonewort	2020	2020	County Rare.
<i>Oenothera agg.</i>	Evening Primrose	2020	2020	
<i>Oenothera biennis</i>	Common Evening-primrose	2020	2020	
<i>Ophrys apifera</i>	Bee Orchid	2020	2020	
<i>Oxalis corniculata var. atropurpurea</i>		2020	2020	
<i>Papaver rhoeas</i>	Common Poppy	2020	2020	
<i>Papaver somniferum</i>	Opium Poppy	2020	2020	
<i>Pentaglottis sempervirens</i>	Green Alkanet	2020	2020	Invasive potential.
<i>Persicaria amphibia</i>	Amphibious Bistort	2020	2020	

<i>Phalaris arundinacea</i>	Reed Canary-grass	2020	2020	
<i>Phalaris canariensis</i>	Canary-grass	2020	2020	
<i>Phragmites australis</i>	Common Reed	1996	2020	
<i>Picea abies</i>	Norway Spruce	2018	2020	Planted.
<i>Plantago lanceolata</i>	Ribwort Plantain	2020	2020	
<i>Plantago major</i>	Greater Plantain	2020	2020	
<i>Poa annua</i>	Annual Meadow-grass	2020	2020	
<i>Poa pratensis sens. lat.</i>	Smooth Meadow-grass	2020	2020	
<i>Poa trivialis</i>	Rough Meadow-grass	2020	2020	
<i>Polygonatum x hybridum</i>	Garden Solomon's-seal	2020	2020	Planted.
<i>Polygonum aviculare agg.</i>	Knotgrass	2020	2020	
<i>Polypogon monspeliensis</i>	Annual Beard-grass	2020	2020	Nationally Scarce but listing needs updating.
<i>Populus x canadensis</i>	Hybrid Black-poplar	2020	2020	Planted.
<i>Potamogeton crispus</i>	Curled Pondweed	2020	2020	County vulnerable.
<i>Potamogeton perfoliatus</i>	Perfoliate Pondweed	2020	2020	Declining in England. County Vulnerable. Axiophyte.
<i>Potentilla anserina</i>	Silverweed	2020	2020	
<i>Potentilla reptans</i>	Creeping Cinquefoil	2020	2020	
<i>Prunella vulgaris</i>	Selfheal	2020	2020	
<i>Prunus avium</i>	Wild Cherry	2020	2020	
<i>Prunus cerasifera</i>	Cherry Plum	2020	2020	
<i>Prunus laurocerasus</i>	Cherry Laurel	2020	2020	Planted.
<i>Prunus lusitanica</i>	Portugal Laurel	2020	2020	Planted.
<i>Prunus spinosa</i>	Blackthorn	2020	2020	
<i>Quercus ilex</i>	Evergreen Oak	2018	2020	Planted.
<i>Quercus robur</i>	Pedunculate Oak	2020	2020	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	2020	2020	
<i>Ranunculus repens</i>	Creeping Buttercup	2020	2020	
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	2018	2018	
<i>Reseda lutea</i>	Wild Mignonette	2020	2020	
<i>Reseda luteola</i>	Weld	2020	2020	

<i>Ribes sanguineum</i>	Flowering Currant	2020	2020	Planted.
<i>Robinia pseudoacacia</i>	False-acacia	2020	2020	Planted.
<i>Rosa canina</i>	Dog-rose	2020	2020	
<i>Rosa canina agg.</i>	Dog-rose	2020	2020	
<i>Rosa canina group Pubescentes</i>	Dog-rose	2020	2020	
<i>Rubus armeniacus</i>		2020	2020	Invasive.
<i>Rubus fruticosus agg.</i>	Bramble	2020	2020	
<i>Rubus ulmifolius</i>	Elm-leaved Bramble	2020	2020	
<i>Rumex crispus</i>	Curled Dock	2020	2020	
<i>Rumex obtusifolius</i>	Broad-leaved Dock	2020	2020	
<i>Rumex sanguineus</i>	Wood Dock	2020	2020	
<i>Sagina filicaulis</i>	Upright Pearlwort	2020	2020	
<i>Sagina procumbens</i>	Procumbent Pearlwort	2020	2020	
<i>Salix alba</i>	White Willow	1996	2020	
<i>Salix caprea</i>	Goat Willow	2020	2020	
<i>Salix cinerea subsp. cinerea</i>	Grey Willow	2020	2020	
<i>Salix cinerea subsp. oleifolia</i>	Rusty Willow	2018	2020	
<i>Salix purpurea</i>	Purple Willow	2018	2020	Axiophyte. Probably planted.
<i>Salix viminalis</i>	Osier	2020	2020	
<i>Salix x fragilis</i>	Hybrid Crack-willow (S. euxina x alba)	1996	2020	
<i>Salix x sepulcralis</i>	S. alba x babylonica	2020	2020	Planted.
<i>Sambucus nigra</i>	Elder	1996	2020	
<i>Samolus valerandi</i>	Brookweed	1996	2020	Axiophyte.
<i>Scrophularia auriculata</i>	Water Figwort	2020	2020	
<i>Sedum acre</i>	Biting Stonecrop	2020	2020	
<i>Sedum album</i>	White Stonecrop	2018	2020	
<i>Senecio jacobaea</i>	Common Ragwort	2020	2020	
<i>Senecio vulgaris</i>	Groundsel	2020	2020	
<i>Sherardia arvensis</i>	Field Madder	2020	2020	
<i>Silene latifolia</i>	White Champion	2020	2020	
<i>Silybum marianum</i>	Milk Thistle	2020	2020	Axiophyte.
<i>Sinapis arvensis</i>	Charlock	2020	2020	
<i>Sisymbrium officinale</i>	Hedge Mustard	2020	2020	
<i>Solanum dulcamara</i>	Bittersweet	2020	2020	
<i>Solanum nigrum</i>	Black Nightshade	2020	2020	

<i>Sonchus arvensis</i>	Perennial Sow-thistle	2020	2020	
<i>Sonchus asper</i>	Prickly Sow-thistle	2020	2020	
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	2020	2020	
<i>Stellaria media</i>	Common Chickweed	2020	2020	
<i>Symphoricarpos albus</i>	Snowberry	2020	2020	Planted.
<i>Symphytum officinale</i>	Common Comfrey	2020	2020	
<i>Symphytum x uplandicum</i>	Russian Comfrey (S. asperum x officinale)	2020	2020	Invasive potential.
<i>Tanacetum parthenium</i>	Feverfew	2020	2020	
<i>Taraxacum agg.</i>	Dandelion	2020	2020	
<i>Taraxacum glauciniforme</i>	A Dandelion	2020	2020	County Rare.
<i>Thlaspi arvense</i>	Field Penny-cress	2020	2020	
<i>Tilia x europaea</i>	Lime	2020	2020	
<i>Trifolium dubium</i>	Lesser Trefoil	2020	2020	
<i>Trifolium repens</i>	White Clover	2020	2020	
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	2020	2020	
<i>Tussilago farfara</i>	Colt's-foot	2020	2020	
<i>Typha angustifolia</i>	Lesser Bulrush	1996	2020	Axiophyte.
<i>Typha latifolia</i>	Bulrush	2020	2020	
<i>Urtica dioica</i>	Common Nettle	1996	2020	
<i>Urtica urens</i>	Small Nettle	2020	2020	
<i>Verbascum thapsus</i>	Great Mullein	2020	2020	
<i>Veronica arvensis</i>	Wall Speedwell	2020	2020	
<i>Veronica chamaedrys</i>	Germander Speedwell	2020	2020	
<i>Veronica filiformis</i>	Slender Speedwell	2020	2020	
<i>Veronica hederifolia subsp. lucorum</i>	Ivy-leaved Speedwell	2020	2020	
<i>Veronica persica</i>	Common Field-speedwell	2020	2020	
<i>Veronica polita</i>	Grey Field-speedwell	2020	2020	Axiophyte.
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell	2020	2020	
<i>Viburnum lantana</i>	Wayfaring-tree	2020	2020	Planted.
<i>Viburnum opulus</i>	Guelder-rose	2020	2020	
<i>Viola odorata var. dumetorum</i>	Sweet Violet	2020	2020	
<i>Viola odorata var. odorata</i>	Sweet Violet	2020	2020	
<i>Vulpia myuros</i>	Rat's-tail Fescue	2020	2020	

<i>X Cuprocyparis leylandii</i>	Leyland Cypress	2020	2020	Planted
Ladybirds				
<i>Coccinella septempunctata</i>	7-spot Ladybird	2020	2020	
Liverworts				
<i>Marchantia polymorpha subsp. ruderalis</i>	Common Liverwort	2020	2020	
<i>Pellia endiviifolia</i>	Endive Pellia	2018	2020	
Moss				
<i>Orthotrichum diaphanum</i>	White-tipped Bristle-moss	2020	2020	
Miscellaneous				
<i>Talpa europaea</i>	Mole	2020	2020	
<i>Oryctolagus cuniculus</i>	Rabbit	2020	2020	
<i>Capreolus capreolus</i>	Roe Deer	2020	2020	
<i>Aceria myriadeum</i>	Acer Gall	2020	2020	
<i>Rhytisma acerinum</i>	Sycamore Tar Spot	2020	2020	
<i>Aglais urticae</i>	Small Tortoiseshell	2020	2020	
<i>Inachis io</i>	Peacock	2020	2020	
<i>Tyria jacobaea</i>	Cinnabar	2020	2020	

Appendix II: Site Photos



The reed fringed shore of the lake



The patch of Corn Mint on the lake bank



Patches of Hoary Cress on the bank adjacent to the A142



Stands