FIVE YEAR MANAGEMENT PLAN

2023-2028

CORSTON QUARRY AND POND LOCAL NATURE RESERVE

CORSTON, WILTSHIRE

CONTENTS

MANAGEMENT PLAN 2023 - 2028
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1. SITE DETAILS

Site Name:	Corston Quarry and Pond Local Nature Reserve
Parish:	Malmesbury St Paul without Parish
County:	Wiltshire
Grid reference:	ST 924843 (Land Ranger No.173 1:50,000)
Area:	0.5 hectares (1.2 acres)
Status:	Local Nature Reserve (LNR), County Wildlife Site
Owner:	Malmesbury St Paul without Parish Council
Access:	Permissive access via adjacent bridleway. No public rights of way within the site.

2. ENVIRONMENTAL INFORMATION

2.1 The site

Corston Quarry and Pond Local Nature Reserve (LNR) lies within the village of Corston, 3km south of Malmesbury in the north of Wiltshire (see Map 1 Location).

The old limestone quarry has a deeper central area occupied by a groundwater-fed pond which is surrounded by limestone grassland on thin soil over bedrock. The base of the quarry is at least 3m lower than land to the north. The reserve is sheltered by calcareous trees and shrubs on the quarry banks (see Map 2 Habitats). The LNR is surprisingly rich in wildlife despite its small size - approximately 85m W-E by 55m N-S. Immediately adjacent land use comprises species-poor grassland, a garden and another larger disused quarry which does not hold water. Intensively managed pasture and arable fields with a network of hedgerows occupy the land beyond. The Gauze Brook runs to the south and there are several other ponds in fields and gardens nearby. The nature reserve is accessed via a gravel track to the north-west.

Once quarrying ceased in the 1950's, the site was abandoned and left to natural colonisation by plants and animals, apart from a few planted ornamental trees. The only man-made structures are the perimeter fences, two seats, a signboard, steps and a pedestrian access gate.

An informal grass path leads from the gate to the open grassland at the eastern end and circles the pond. The path is steep in places and becomes somewhat over-grown during summer. The gently shelving shoreline of the pond and the flat grassland are easily accessible, and the nature reserve is regularly visited and much valued by the local community.

2.2. History and geology

The oolitic limestone quarry is not shown on OS maps prior to 1900 so it must have been created after this date. It belonged to the owners of Quarry House and yielded stone of varying quality. The upper layers were crushed and used to surface cattle yards and field entrances, and for infilling the trench created in the 1940's when extensive water mains and sewers were installed in the area. The stone at the base of the quarry is thicker and more durable, and may have been used for buildings and stone walls. The quarry was operated by Mr Tanner, who ran the nearby brickyard, and was worked by hand using pick and shovel and "black powder" (Mr Payne, pers. comm.).

The quarry stopped operating during the 1950s. The new owner, an engineer working on the construction of the M4 motorway, planted some ornamental trees, some of which have now been removed.

The site came into public ownership in 1995 through a S106 agreement under the Town and Country Planning Act 1990 which stipulated that the land should be given for the purposes of public amenity to the local Parish Council within three months of completion of an adjacent housing development.

It was declared a Local Nature Reserve in 2005 under S21 of the National Parks and Access to the Countryside Act 1949 (as amended), giving it protection in perpetuity under law. Its primary purpose is to be managed to enhance its value for wildlife and for public appreciation, enjoyment and education.

2.3. Ownership & Management

The site is wholly owned by Malmesbury St Paul without Parish Council, and is managed as a nature reserve and community resource. A Management Committee of local people undertakes a regular programme of work to maintain the site, enhance its wildlife value and encourage appropriate recreational and educational use.

Over 1000 volunteer hours have been spent working on the site since 1997, an average of around 40 hours per year. The Parish Council has some discretionary funds and will consider requests for financial support as and when finances allow.

2.4. Habitats and plant communities

Corston Quarry and Pond LNR was surveyed in 1997 and 2010 (see Appendix 1). The plant list was updated in 2022.

The approximate extent of the main habitats present (see Map 2) is:

Pond	0.1 hectares (0.2 acres)
Species-rich calcareous grassland	0.2 ha (0.4 acres)
Calcareous scrub with trees	0.2 ha (0.5 acres)

Pond

The pond's substrate is limestone bedrock overlying thick layers of Kellaways clay, with a shallow but increasing layer of silt. It is primarily groundwater fed, so water quality is generally very good. Because of the underlying clay, the pond never totally dries out, although water levels are much reduced during hot dry summers such as that experienced in 2022. Pond water levels are therefore very vulnerable to climate change impacts, particularly low summer rainfall and high summer temperatures. The increase in algal growth and reedmace over recent years is also related to increasing silt levels as a result of decomposing leaves from surrounding trees and shrubs.

Stands of common spike-rush *Eleocharis palustris* and cyperus sedge *Carex pseudocyperus* (uncommon in Wiltshire) occupy the margins of the pond, with gypsywort *Lycopus europaeus* and water mint *Mentha aquatica*. Broad-leaved pondweed *Potamogeton natans* constitutes the main floating vegetation, with rafts of stonewort *Chara* spp. indicating clean calcareous water. Great reedmace *Typha latifolia* is a vigorous aquatic plant which spreads rapidly and needs regular management to keep it in check and avoid crowding out the other species.

Open ponds with a diverse vegetation structure and clean water, unaffected by human activities, are not common in the county. This pond is particularly rich in wildlife due to its good water quality and sheltered position.

Several other nearby ponds in gardens and on farmland are important for supporting meta-populations of species such as toads and great crested newts – the pond at ST923844 has a record for breeding populations of both. Safe passage along sheltered hedgerows is important for migratory amphibians, with little or no vehicular traffic.

Grassland

The grassland occupying the flat, open ground to the east of the pond has developed on very thin soil over bedrock. The low nutrient levels allow herbs to grow unimpeded by more vigorous vegetation; this is further aided by rabbits selectively grazing the grasses. Mosses are frequent, and the occurrence of damp-loving plants in areas shows the occasional presence of standing water in winter. The plant community is dynamic and changes over time, with tall herbs such as perforate St John's wort *Hypericum perforatum* becoming increasingly dominant. The species-richness is totally reliant on thin poor soils and continuous rabbit grazing.

The more mature grassland occupying the undulating ground to the north west of the pond has species indicative of slightly deeper, more nutrient-rich soil. Although dominated by

grasses, there is a good diversity of calcareous grassland plants such as greater knapweed *Centaurea scabiosa* and black knapweed *C. nigra*, lady's bedstraw *Galium verum*, field scabious *Knautia arvensis* and cowslip *Primula veris*.

Limestone grassland is an important habitat for wild flowers and insects that has become much less common as a result of agricultural intensification. With appropriate management, the grassland will become increasingly significant in the conservation of this regionally distinctive habitat.

Trees and shrubs

Trees and shrubs occupy relatively narrow strips around the margins of the old quarry. The calcareous scrub is fairly dense and includes dogwood *Cornus sanguinea*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, wild privet *Ligustrum vulgare*, guelder rose *Viburnum opulus*, wayfaring tree *V. lantana* and purging buckthorn *Rhamnus catharticus*, with dog rose *Rosa canina* and bramble *Rubus fruticosus*. Trees include silver birch *Betula pendula,* ash *Fraxinus excelsior*, wild cherry *Prunus avium* and sycamore *Acer pseudoplatanus*. Ash and sycamore have been progressively removed over recent years as they are invasive and set seed readily. There are several stands of young wild cherry developing from suckers.

The trees and shrubs provide shelter to the pond and its immediate environs, benefiting both wildlife and visitors. However, trees on the southern bank in particular cast shade and shed large quantities of leaves into the pond, adding to nutrient and silt loadings. The scrub and bramble are also encroaching into the grassland in places.

Without intervention, the presence of trees and shrubs threatens the long-term future of the pond through siltation and the grassland in the absence of regular mowing or controlled grazing. Ash may be less of a problem in the future due to ash die-back.

2.5. Fauna

The LNR provides an excellent habitat for amphibians, reptiles and aquatic invertebrates such as dragonflies and damselflies. The herb-rich grassland supports butterflies characteristic of limestone grassland and provides good habitat for ground-dwelling invertebrates such as beetles. The dense scrub provides food and shelter for breeding and wintering birds. The mosaic of habitats makes the site potentially valuable for hedgehogs and foraging bats.

The pond is an important breeding site for great crested newt *Triturus cristatus* (a protected species under the Conservation of Habitats and Species Regulations 2019 whose breeding sites are protected under law) and common toad *Bufo bufo,* a priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Both species therefore require special consideration if any nearby development is proposed and when planning site management. Toad populations have declined sharply in the UK due to loss of habitat, the spread of chytrid fungus and a dearth of returning females.

Breeding dragonflies are under-recorded but include the common darter *Sympetrum striolatum* and Emperor dragonfly *Anax imperator*. An eel was recorded one year whilst removing reedmace, presumably having made its way up the roadside ditch from the Gauze Brook. Ornamental fish were introduced in 2000, but fortunately did not survive, possibly because of regular visits from kingfishers and herons. Moorhen *Gallinula chloropus* breed on the small island and in the surrounding scrub.

Opportunistic records of birds include visiting green woodpecker *Picus viridis* and bullfinch *Pyrrhula pyrrhula*, now regarded as a species of high conservation concern in Britain.

The grassland supports a few anthills and butterflies including marbled white *Melanargia galathea*, common blue *Polyommatus hyperantus*, meadow brown *Maniola jurtina*, small tortoiseshell *Aglais urticae* and ringlet *Aphantopus hyperantus*. Their primary larval food plants are red fescue, Yorkshire fog, rough and smooth meadow grass. Cinnabar moth *Tyria jacobaea* caterpillars are dependent upon ragwort *Jacobaea vulgaris* which is present in the grassland.

Grass snakes *Natrix helvetica helvetica* and slow worms *Anguilis fragilis* (a legless lizard) have been found whilst carrying out site management. Glow-worms *Lampyris noctiluca,* now uncommon in Britain, have been recorded since 2003 both in the reserve and along the adjacent bridleway. There is a rabbit warren and an old badger sett (possibly an outlier) in the banks, and foxes are regular visitors to the area. See Appendix 1 for additional species information.

3. SUMMARY OF CONSERVATION INTEREST

Corston Quarry and Pond's wildlife interest, attractiveness and suitability for quiet enjoyment by children and adults, make it an especially valuable community resource. It was designated as a Local Nature Reserve in 2005 and is recognised as a Wiltshire County Wildlife Site.

In a local context, the habitats and species present are infrequent and declining. The key habitats and species of particular nature conservation importance are:

Habitats

- Clean, standing open water
- Lowland, species-rich calcareous grassland
- Species-rich calcareous scrub

Flora

- Bee orchid
- Cyperus sedge

Fauna

- Great crested newt (breeding)
- Common toad (breeding)
- Bullfinch
- Slow worm
- Glow worm
- Grass snake
- Dragonflies and damselflies

4. NATURAL CAPITAL VALUE

The LNR is a critical element of natural capital locally, and provides many ecosystem services (the benefits we get from nature). It should be recognised as an important part of the UK's Nature Recovery Network, and Wiltshire's Local Nature Recovery Strategy, mandatory spatial strategies established under the Environment Act 2021.

The LNR has an important role to play in carbon storage. Recent studies have shown that small ponds can sequester between 79-247g of organic carbon per square metre annually, a rate 20-30 times higher than woodlands, grasslands and all other habitat types (Taylor et al., 2019)[1]. Grasslands with high species diversity can also store 5 times more carbon than monocultures such as intensive grassland and arable fields. Other benefits provided by the reserve include water purification, flood alleviation, aesthetic, spiritual and cultural services.

The LNR is a hot spot for biological diversity, its intimate mosaic of habitats supporting rare and endangered species. Its value as a local amenity, providing inspirational and accessible public open space for the quiet contemplation of natural beauty, was highlighted during the recent global pandemic. It is clearly an important local resource for physical and mental health and well-being. Involvement in the Management Group enhances social cohesion, bringing local people together in a common cause and developing relationships.
The LNR gives local people safe and easy access to an area rich in wildlife and history. Currently mainly used for casual recreation, there is great potential for open days and annual events such as torchlight toad and newt counts and glow-worm safaris. It is also suitable for educational and citizen science activities such as pond dipping, butterfly and dragonfly recording and moth trapping. Pond dipping nets, trays and identification guides are held locally by one of the volunteers. Open days linked to village events have been well attended and greatly enjoyed by adults and children, and have contributed to the biological records.

The nearby primary schools at Malmesbury, Seagry and Great Somerford, and the secondary schools at Malmesbury could use the LNR for studying wildlife. The Malmesbury Group of the Wiltshire Wildlife Trust could also be encouraged to use the area, inviting community participation and biological recording at the same time.

As an LNR, grant aid can be obtained for purchasing equipment such as wildlife cameras and producing supporting material for open days and recording events.

Regular contact with the Parish Council and meetings with the Management group are essential, to ensure people know the dates and reasons for planned educational and maintenance activities. Corston's Facebook page is used to publicise meetings and task dates, and to inform people of interesting sightings.

[1] Taylor, S., Gilbert, PJ., Cooke, DA., *et al.* (2019) High carbon burial rates by small ponds in the landscape. *Frontiers in Ecology and the Environment.* 17(1), 25-31.

Adult glow worm

5 LIMITATIONS AND OBLIGATIONS

Limitations

- The LNR is valued by local residents for its tranquillity and solitude, natural beauty and wildlife - inappropriate management or inadequate explanation of management activities may cause conflict.
- Habitat management is arranged and undertaken by a small group of volunteers - time and labour is limiting, as is finance for capital works.
- Wetlands are potential safety hazards, but the shallow depth of the pond and the gently shelving banks greatly reduce the risks. There have been no recorded Health and Safety incidents since the site came into public ownership.

Obligations

- Corston Quarry and Pond LNR is legally protected and should be managed over the long term for the benefit of wildlife and the local community.
- Key habitats and species of conservation importance should be protected and enhanced through appropriate management.
- The site and facilities must be safe to use, and there should be regular safety checks.

5. THREATS AND OPPORTUNITIES

The main issues and activities threatening the future value of the LNR are:

- Changes to the hydrological regime resulting from the impacts of climate change, particularly high summer temperatures and low rainfall, but also any alterations to groundwater levels and flow as a result of the development of adjacent land;
- Changes to water quality resulting from changed land use around the LNR including run-off from roads and the use of fertilisers, herbicides and insecticides;
- The introduction of non-native plants (especially aquatic plants such as water soldier *Stratiotes aloides* which had to be removed recently) and species such as goldfish, presumably disposed of from local garden ponds;
- Pressure for building houses on land around the LNR and resultant increase in use (especially from dog walkers), dumping of garden waste, disturbance from noise, light pollution and predation. Newts, slow worms and grass snakes, birds and small mammals are all very vulnerable to predation by domestic cats;
- Any proposal to surface the bridleway and increase vehicular traffic, which would increase the risk of mortality to migratory amphibians and reptiles.

Opportunities include:

- More active use of the LNR for education and community events;
- Securing adjacent land for incorporation into local public open space that can be enhanced for wildlife and help to buffer the LNR;
- Ensuring safe access for migratory species through effective habitat corridors connecting to the wider countryside and nearby ponds.

6. CAPITAL WORK

Capital grants were obtained to clear the pond of reedmace and silt during the autumn of 2014 and 2015. Local contractors, Akers Construction from Charlton, undertook the work and the silt was disposed of in a useful depression on site, reducing the costs considerably.

A grant also covered LANTRA certificated training for two local volunteers in the safe use and maintenance of chain saws and brushcutters, the purchase of personal protective equipment, and the replacement of one of the wooden seats.

Clearing the reedmace and disposing of the silt, autumn 2015

Further capital projects will be needed in the near future as the 2022 drought revealed considerable build-up of more silt and further colonisation of reedmace which is too difficult to remove by hand. The purchase of a mowing machine would greatly help with maintenance of the species-rich grassland, and the entrance sign needs to be replaced.

It will therefore be necessary to prepare further funding bids in the near future. Possible sources of finance include:

- Wessex Water Foundation's Environment Fund https://www.wessexwater.co.uk/community/apply-for-funding/the-environment-fund
- Malmesbury Carnival https://www.malmesburycarnival.co.uk/carnival-grants and
- National Lottery Grants for Heritage (£3k- £10k) https://www.heritagefund.org.uk/funding/national-lottery-grants-heritage-3k-10k

7 WORK OBJECTIVES

7.1 Pond

Maintain the area of open water by removing silt and encroaching greater reedmace as necessary to contain it within discrete blocks.

Reduce shading of the pond and deposition of leaves into the water by removing trees, particularly wild cherry and sycamore, and coppicing hawthorn and willow scrub on the southern side.

2. Grassland & scrub

Maintain the species-rich grassland by selectively cutting thistles and encroaching scrub.

Mow areas of the grassland if necessary and rake to remove all cut vegetation.

Maintain dense, low scrub by coppicing hawthorn and other species, and selectively removing quick growing, prolific trees such as ash, wild cherry and sycamore, working on no more than 25% of the scrub area in any one year.

NOTE: ash die-back may mean that removal of ash trees is not so urgent

A controlled grazing regime would be beneficial, but better fencing and a self-closing kissing gate would be needed and it might be necessary to temporarily suspend access for visitors with dogs. It may be hard to find a local grazier prepared to bring animals to the site because of its small size and potential disturbance by visitors with dogs.

As an alternative, it would be desirable to investigate the purchase of a robust mowing machine that can tackle rough ground and collect cut material.

7.3 Visitors and educational use

*Ensure the site is safe by undertaking quarterly checks and an **annual site safety assessment**, removing any rubbish and repairing/removing unsafe structures and trees.*

Ensure safe access throughout the site by keeping the path open and steps in good condition.

Encourage responsible use by dog walkers i.e. picking up after their dogs and preventing them from swimming in the pond. This is important because flea treatments often contain cypermethrin, tiny amounts of which are toxic to aquatic life.

Encourage public and educational use of the site and explain its natural history by replacing and maintaining the interpretive signboard at the entrance and providing attractive leaflets. NB The leaflet dispensers are prone to vandalism, and require replacing and topping up at regular intervals.

Encourage public understanding of the value of the reserve through open days and community events.

7.4 Monitoring

Continue to monitor habitat change; take fixed point photographs to record management and inform future plans.

Update botanical information. Survey amphibian, Odonata, glow worm, moth and butterfly populations to improve the understanding and appreciation of key species associated with the site; undertake appropriate management to ensure their continued presence on site.

8 FIVE YEAR WORK PROGRAMME

The work programme is flexible, as tasks will depend on available labour and resources. Tasks can be delayed to subsequent years, but the timing of work within each year must be adhered to in order to avoid damage and disturbance to wildlife.

The work programme assumes there will be at least two weekend working parties each year. Currently, there are 2-4 per year, usually on Sunday mornings during the periods January - March, June/July (path cutting) and September - November.

All hours worked should be logged after each task (see Table 1) and work marked on Map 3 Habitat Management.

8.1 YEAR 1

8.1.1 Reed control

Remove greater reedmace growing around the edges of the main blocks and in outlying areas. When removing the reed, grasp the stems at the base and pull to remove both the main stem and side rhizomes.

A Lazy Dog tool https://lazydogtools.co.uk/category/lazy-dog/ can be used to lever the rhizomes out. Quantities of silt are often removed at the same time, making the material particularly heavy. To reduce disruption, pulled plants can be transported on an inflatable dinghy and should be left on the bank for a few days to dry out and allow any aquatic animals to return to the pond. The material should then be removed and heaped in discrete areas (see below). **Record the area of reed cleared by marking it on a plan of the pond.**

NOTE: this is heavy and dirty work, requiring overalls and waders. Those carrying out the work should be reminded to keep their back straight and not to over-exert or twist when pulling the reeds. Consider purchasing a Lazy Dog tool to make this task less physically demanding.

Reedmace can be pulled from September to mid-February - ideally in **late September/early October** when toads and newts are unlikely to be present, water levels are low and it is not too cold. This is an ideal time to create habitat piles for grass snakes and amphibians. Create a base with criss-crossed branches and logs (from scrub removal - see 8.1.2 below). Pulled reeds can be placed on top to create a moist, aerated habitat. Large heaps are better than small ones, and should be sited out of the way in areas of scrub. **Reed piles must not be placed on the grassland or anywhere near the pond.**

NOTE: Toads and great crested newts start entering water to spawn in late February/ March and toadlets come ashore in May-June, during which periods no management work should be undertaken in or immediately adjacent to the pond.

8.1.2 Tree and scrub control

Selectively remove hawthorn, wild cherry and sycamore (including seedlings, suckers and regrowth from previously cut stumps) from the **southern side** of the pond to prevent shading and leaf fall (see Map 3). Coppice elder; retain tree stumps with ivy which provides valuable winter cover and food for invertebrates and small birds.
Cut back invading scrub and bramble (particularly privet, dogwood, bramble, hawthorn and willow) from the grassland and pond edges. Do this in late autumn/early winter in association with removal of reeds from the pond and creation of habitat piles. Use the cut material to create discrete, dense heaps as described in 8.1.1 above; the side shoots on cut stems and branches are best removed. Pile the cut material within areas of scrub, **never** on the grassland. Log piles (and old dry stone walls) provide important shelter for great crested newts.

All trees and unwanted scrub must be cut at ground level and treated immediately with an approved herbicide such as Glyphosate or Garlon (Kaskara or Broadshot) to prevent regrowth. Glyphosate can be applied in capsule form or as eco-plugs; these come with a modified drill bit to drill into the stump. The capsule or plug is placed into the hole and lightly tapped in; see https://www.progreen.co.uk/ecoplug-max-100-plugs-prevent-tree-stump-regrowth/.

Glyphosate can also be painted onto cut stumps, in which case a dye should be mixed with the chemical to enable the user to keep track of progress. **NOTE: this should only be undertaken in dry weather by an appropriately trained and licensed individual. Do not use chemicals near the pond in case of leaching.**

Remove by pulling out any small willow saplings growing at the pond edges and regularly coppice the larger scrubby willows (for example those growing on the island) to ensure they do not cause excessive shading and leaf fall (see Map 3).

Coppice the crack willow every 5-10 years (see Map 3), but allow re-growth i.e do not treat the cut stumps.

Inspect and clear the fencelines of bramble, ivy and old man's beard annually. Trim the planted shrubs along the eastern boundary of the site in an undulating fashion so that the neighbours can still see the pond but the planting does not resemble a garden hedge. Coppice the field maple, spindle and dogwood planted here on a 5-10 year rotation.

8.1.3 Site safety

Cut or mow the path at least once each year in early June or July. Cut back overhanging bramble, privet, hawthorn, nettle, willowherb and other vegetation in a 1-2m strip adjacent to the path for safe and easy access.

Check the site at least once every three months to ensure that the gate, seats, paths, steps and fencing are safe, there are no dangerous overhanging branches or dying trees, and that there is no litter. Check for dog mess in the grassland; contact with Toxocara found in dog excrement

is a significant health and safety hazard, so it may be necessary to take preventative action (see 8.1.5 below).

4. Grassland

Cut and remove thistles **before flowering** (during early July) to prevent seed set and encourage rabbit grazing. If ragwort increases to the point that it could become a nuisance to nearby landowners, pull the plants by hand **during July well before seeding, and pile in discrete heaps in areas of scrub** away from neighbouring land.

NOTE: Do not attempt to eradicate ragwort completely as it is an important source of nectar for many invertebrates and the food plant for cinnabar moth caterpillars.

It may be necessary to cut areas of the grassland that are becoming increasingly grass-dominated and lush during June/July. All cut material should be raked up and removed from the grassland, piling it in areas of scrub away from the pond, where it will rot down rapidly.

5. Interpretation

An interpretive signboard at the entrance welcomes visitors and gives information on the wildlife to be seen. The existing sign is now faded and needs to be updated and replaced, then checked regularly and kept clean.

Monitor use of the site by dog walkers because of the health risks (see 8.1.3 above) and because dogs are prone to swimming in the pond, disturbing nesting moorhens. Tiny amounts of flea treatment chemicals are also highly toxic for aquatic life.

It may be necessary to erect a temporary sign to encourage responsible use by dog owners, reminding them of the health risks and the penalties.

6. Monitoring

Update species lists, particularly plants, Odonata, birds and butterflies.

Take **fixed point digital photographs** of the site at least once a year as these will help monitor changes over time. This record will also promote continuity of management regardless of changes in personnel, and be of great interest in the future because of the dynamic nature of the site. Select suitable vantage points and mark them on a plan. Recommended locations are: facing the pond from near the gateway; midway along the eastern boundary; and from the east and west corners of the pond (see Map 3). The photographs can be taken at any time of year, but mid-late summer would be most suitable.

Close-up fixed-point photographs of the different grassland areas will enable assessment of sward composition between years without the need for detailed annual surveys. Select representative areas within both types of grassland. Record the direction (using a compass bearing) and location (using GPS) of the photographs to enable replication in future years. A photograph of a 2 x 2 m block will suffice. This should be done in summer at the same time as taking the other photographs.

Collate all annual photographs into a web album, including details of location, direction, date taken and camera or smartphone used. Refer to the photographs when determining future management plans.

8.1.7 Integration with other habitats in the vicinity

Assess the extent of habitats within at least a 500m radius of the pond, especially ponds and hedgerows. Consult the Local Development Framework plan and seek to retain contiguous corridors of rough grassland and scrub throughout the surrounding area to enable safe passage of great crested newts and toads to and from the ponds.

The bridleway was recently upgraded by a private individual and this has unfortunately encouraged vehicular use. Any proposals to tarmac the track should be vigorously opposed as this could result in unacceptable amphibian mortality and destroy the local colony of glow worms.
Depending on the result of the current appeal against Wiltshire Council's refusal of planning permission to develop housing on adjacent land, consider securing the land for incorporation into public open space as a long term aim for the benefit of the local community. This would improve connections to surrounding habitats and other ponds, buffering and enhancing the LNR's distinctive wildlife and increasing the social and amenity value of the public open space.

8.2 YEAR 2

8.2.1 Reed control

Remove encroaching reedmace and any regrowth from areas cleared in Year 1 in the same manner as detailed in section 8.1.1. Add to existing habitat piles rather than creating new.

8.2.2 Scrub and tree control

Selectively remove all bramble, privet, ash and sycamore (including seedlings and regrowth from previously cut stumps) north of the path along the northern edge of the pond (see Map 3). Pull by hand or use brush-cutter on all sycamore and hawthorn seedlings on the quarry banks and pond edges. Create habitat piles using the cut material and reeds as detailed in section 8.1.1.

Cut back encroaching bramble and privet, remove hawthorn and dog rose from grassland areas. Thin the stands of young wild cherry near the entrance gate.

Clear and make safe the pathway that encircles the pond. Cut in May/June to prevent vegetation from overhanging the path. Inspect and clear the fencelines of bramble, ivy and old man's beard.

8.2.3 Site safety and general tasks

Check the site at least once every three months to ensure it is clean, litter free and safe, cutting back overhanging vegetation. Check the seats and steps to ensure these are sound and safe to use. Check and clean the interpretive signboard at the reserve entrance.

8.2.4 Grassland

Cut and rake areas of grassland as described in 8.1.4, removing cut material to existing piles in areas of scrub. Remove thistles and ragwort as necessary, prior to seeding.

8.2.5 Monitoring

Take fixed point photographs of the site as described in section 8.1.6.

8.3 YEAR 3

8.3.1 Reed control

Remove greater reedmace and regrowth from areas cleared in Years 1 and 2. Replenish existing habitat piles as described in section 8.1.1.

8.3.2 Scrub control

Selectively remove all sycamore to the south of the open, flat grassland at the east end of the site (see Map 3); treat the cut stumps. Retain the fencing on the edge of the sparse grassland as this serves as a marker for preventing scrub encroachment. Cut back invading bramble and scrub from grassland edges. Inspect and clear the fencelines of bramble, ivy and old man's beard. Retain ivy growing up tree trunks as it provides a valuable late pollen and food source.

8.3.3 Site safety and general tasks

Check the site and steps at least once every three months to ensure public safety. Check and clean the interpretive signboard at the reserve entrance.

4. Grassland

Cut and rake areas of the grassland, adding cut material to existing habitat piles in areas of scrub. Remove ragwort and thistles as necessary, prior to seeding.

5. Monitoring

Take fixed point photographs of the site as described in section 8.1.6.

8.4 YEAR 4

8.4.1 Reed control

Remove greater reedmace and regrowth from areas cleared previously. Replenish existing habitat piles as described in section 8.1.1.

8.4.2 Scrub and tree control

Selectively remove bramble and sycamore (and any seedlings) to the south west of the pond and thin cherry suckers. Pull by hand any sycamore and hawthorn seedlings. Consider felling the mature cherry tree because it shades the pond and contributes to siltation. NB this will

require prior explanation using social media and notices on site. Replenish existing habitat piles using the cut material and reedmace.

Cut back invading scrub from grassland edges. Inspect and clear the fencelines of bramble, ivy and old man's beard.

8.4.3 Site safety and general tasks

Check the site and steps at least once every three months and cut back overhanging vegetation from the path to ensure that the site is safe as described in section 8.1.3.

Check and clean the interpretive signboard at the reserve entrance.

4. Grassland

Cut and rake areas of the grassland as described in 8.1.4, removing cut material to existing piles within areas of scrub. Remove ragwort and thistles as necessary, prior to seeding.

8.4.5 Monitoring

Take fixed point photographs of the site as described in section 8.1.6.

8.5 YEAR 5

8.5.1 Reed control

Remove greater reedmace as necessary. Replenish existing habitat piles.

8.5.2 Site safety and general tasks

Check the site at least once every three months to ensure it is safe for visitors. Check and clean the interpretive signboard at the reserve entrance.

8.5.3 Monitoring

Take fixed point photographs of the site as described in section 8.1.6.

8.5.4 Grassland

Cut back invading scrub from grassland edges. Cut and rake grassland areas as necessary, adding cut material to existing piles in areas of scrub away from the pond. Remove ragwort and thistles before seeding. Inspect and clear fencelines of bramble, ivy and old man's beard.

8.5.5 Future management

Survey the site, review condition and prepare the next five year plan (2028-2033) and detailed management prescriptions accordingly.

Check condition of fencing to northern and southern boundaries.
Note: there may be some dispute over the exact location of the southern ownership boundary, as the actual fenceline may not reflect the boundary of ownership. This should be investigated and resolved as soon as possible.

8.6 ADDITIONAL MONITORING

The following actions are desirable, but not essential - they will give a greater understanding and awareness of the pond and its wildlife. Contact the Wiltshire Wildlife Trust (Tel. 01380 725670) well in advance should assistance be required.

Toads

Arrange a community event to count the number of breeding toads and newts in the pond, preferably annually. Select a warm damp evening in late February/March (when the air temperature has reached 7-10^{o}C - spawning can last for as little as ten days so check regularly to catch the breeding period) and search the pond by torchlight. Count the number of toads present in the pond and record the results. **Do not survey alone at night.**

Newts

Search the pond in the evening with a torch in March, April and May to record the presence or absence of newts. Note that identification should be attempted without handling as great crested newts are specifically protected by law. **Do not survey alone at night.**

Odonata

Record adult dragonfly and damselfly species using the site. Visit during warm, still days, once a month from mid-May to September. For each species, record the number present, the number of males and females, and give an assessment of abundance and evidence of ovipositing (egg laying by females).

Butterflies

Survey the grassland areas to record adult butterflies. Visit the site once a month between April - September, ideally over at least 4 visits on warm, still days between 09.45 a.m. and 14.45 p.m. For each species record the number seen (i.e. 1 individual only; 2-9 individuals; 10-29; 30-99; 100+ individuals) and any evidence of egg laying.

Glow worms

Arrange a community event to search for glow-worms during June and early July. Visit after dark on warm still evenings. Try to keep to the paths to avoid trampling.

9 WORK PROGRAMME CHECK LIST AND ROUGH COSTS 2023-2028

	COSTS	Year 1	Year 2	Year 3	Year 4	Year 5
ESSENTIAL						
Check site safety every 3 months		✓	✓	✓	✓	✓
Clear reedmace (if necessary) in September/October		✓	✓	✓	✓	✓

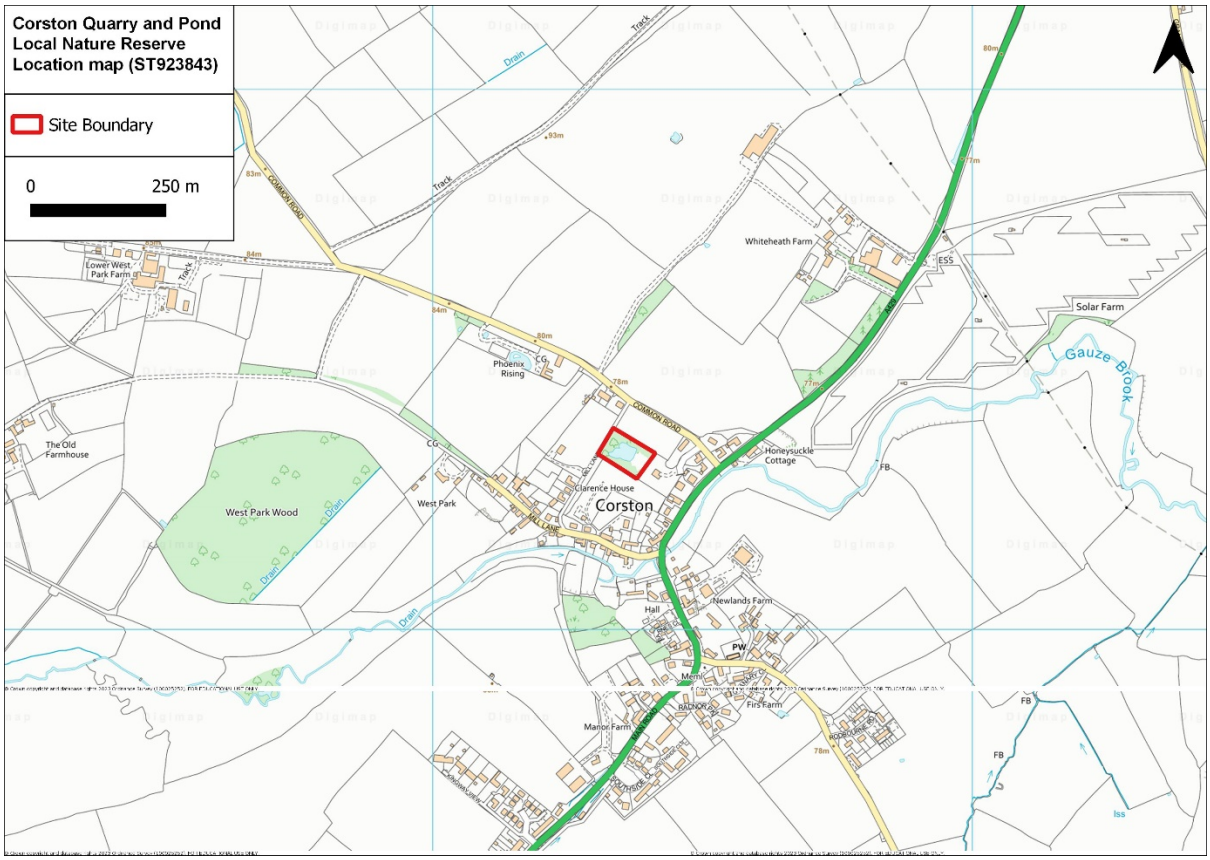
Cut & remove thistles, pull ragwort, cut & rake grassland areas in June/July		✓	✓	✓	✓	✓
Take fixed point photographs		✓	✓	✓	✓	✓
Check and clean signs at entrance		✓	✓	✓	✓	✓
Selectively clear scrub north of pond	£50 p.a.		✓			
Check and repair or replace boundary fencelines	£1000+	✓	✓	✓	✓	✓
Coppice scrub and remove cherry trees south of pond	£80 (fuel, herbicide)	✓		✓		
Selectively clear or coppice scrub at south eastern edge of site	£50			✓		
Maintain path south of pond. Check steps regularly (at least annually) and repair as necessary. Check and repair or replace seats as necessary	£50 (fuel; materials)	✓	✓	✓	✓	✓
Arrange annual meeting of Management Committee to discuss future tasks		✓	✓	✓	✓	✓
Prepare 5 year management plan	£500					✓
OPTIONAL						
Arrange open days & pond dipping sessions		✓	✓	✓	✓	✓
Count breeding toads - March		✓	✓	✓	✓	✓
Arrange glow worm safaris		✓	✓	✓	✓	✓
Survey for great crested newts		✓	✓	✓	✓	✓
Record dragonflies and damselflies		✓				✓
Record butterflies		✓				✓
Re-survey grassland flora		✓				✓
Record birds using reserve		✓		✓		✓

TABLE 1 HOURS WORKED BY VOLUNTEERS										
1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
60.5	**48**	**67**	**65**	**49**	**40**	**24.5**	**37.5**	**25**	**31.5**	**39.5**

2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
36	46	36	35	30	32	42	32	32	22	34

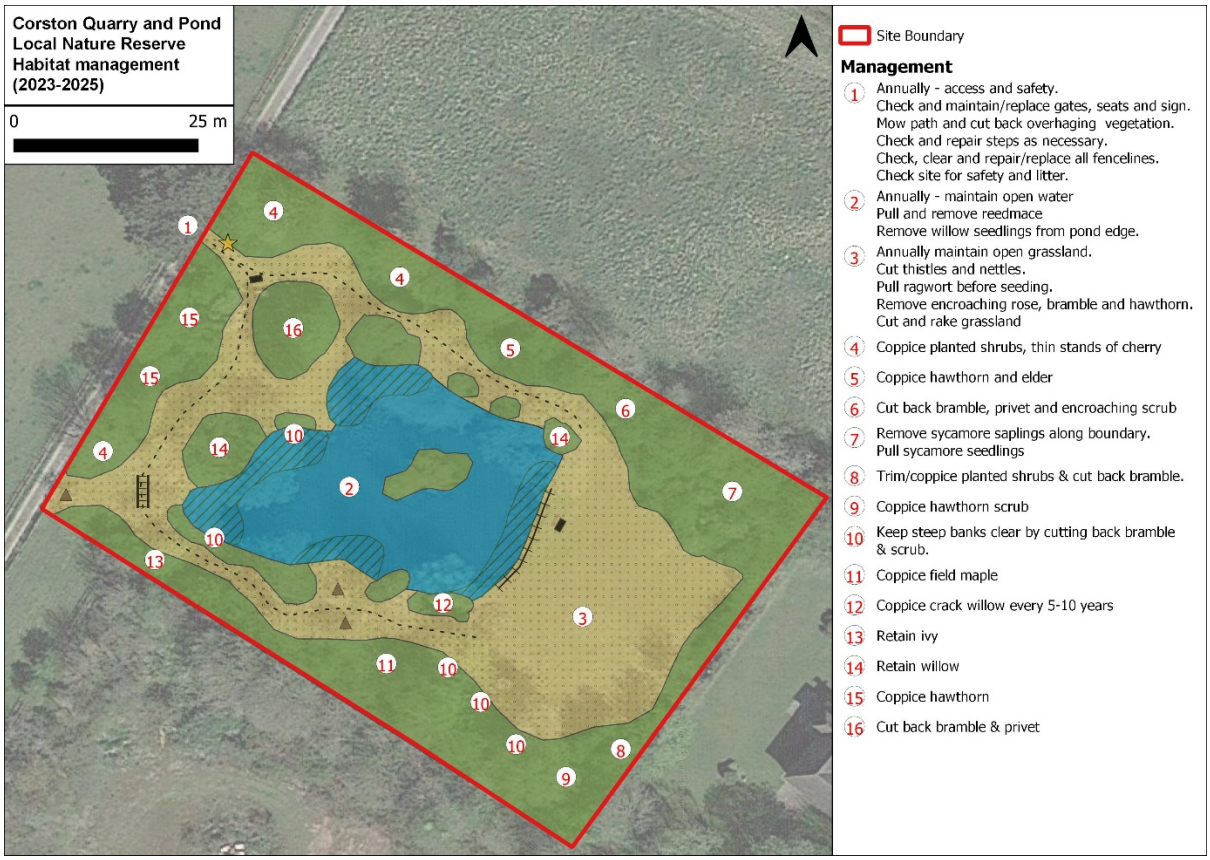
2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
24	18	22								

MAP 1 LOCATION



MAP 2 HABITATS

MAP 3HABITAT MANAGEMENT



APPENDIX 1
Flora recorded at Corston Pond 1997- 2016. Grid ref. ST 924843.

Pond

Carex pseudocyperus	Cyperus sedge	Locally frequent
Carex riparia	Greater pond sedge	
Carex otrubae	False fox sedge	
Chara sp.	Stonewort	
Eleocharis palustris	Common spike-rush	Frequent
Epilobium hirsutum	Great willow-herb	
Epilobium palustre	Marsh willow-herb	
Juncus articulatus	Jointed rush	Occasional
Juncus effusus	Soft rush	
Juncus inflexus	Hard rush	Frequent
Juncus subnodulosus	Blunt-flowered rush	
Lycopus europaeus	Gypsywort	
Myosotis scorpioides	Water forget-me-not	
Mentha aquatica	Water mint	
Potamogeton natans	Broad-leaved pondweed	Abundant
Scrophularia auriculata	Water figwort	Several individuals
Solanum dulcamara	Woody nightshade	
Typha latifolia	Greater reedmace	Locally dominant
Lycopus europaeus	Gypsywort	Locally frequent

Sparse grassland east of pond

Arctium pubens	Burdock	
Anagallis arvensis	Scarlet pimpernel	Several individuals
Anacamptis pyramidalis	Pyramidal orchid	(1 in 2004)
Bellis perennis	Daisy	Frequent
Carex otrubae	False fox sedge	
Cerastium sp.	Mouse-ear sp.	Several individuals
Chenopodium rubrum	Red goosefoot	
Cirsium arvense	Creeping thistle	
Cirsium vulgare	Spear thistle	Occasional
Crepis capillaris	Smooth hawksbeard	Several individuals
Dipsacus fullonum	Teasel	Several individuals
Galium verum	Lady's bedstraw	Abundant
Geranium dissectum	Cut-leaved cranesbill	
Geranium molle	Dovesfoot cranesbill	Occasional
G. robertianum	Herb robert	
Geum urbanum	Wood avens	
Glechoma hederacea	Ground ivy	Frequent
Hypericum perforatum.	Perforate St John's wort	Locally frequent
Leontodon taraxacoides	Lesser hawkbit	Occasional
Leucanthemum vulgare	Ox-eye daisy	Occasional

Lotus corniculatus	Bird's foot trefoil	Frequent
Medicago lupulina	Black medick	Abundant
Mentha aquatica	Water mint	Occasional
Myosotis arvensis	Field forget-me-not	Occasional
Ophrys apifera	Bee orchid	Several individuals
Plantago lanceolata	Ribwort plantain	Occasional
Pulicaria dysenterica	Common fleabane	Occasional
Prunella vulgaris	Selfheal	Abundant
Rumex obtusifolius	Broad-leaved dock	Several individuals
Senecio erucifolius	Hoary ragwort	Several individuals
Senecio jacobaea	Common ragwort	Occasional
Silene alba	White campion	
Silene dioica	Red campion	Several individuals (edge)
Sonchus asper	Prickly sow-thistle	Occasional
Torilis japonica	Upright hedge parsley	
Urtica dioica	Stinging nettle	Occasional (east edge)
Verbascum thapsus	Great mullein	Occasional
Viola odorata	Sweet violet	Locally frequent

Mature grassland west and north of pond

Arrenatherum elatius	False oat grass	
Avenula pubescens	Downy oat grass	
Brachypodium sylvaticum	False brome	
Briza media	Quaking grass	
Bromopsis erectus	Upright brome	
Bromus sterilis	Barren brome	
Cynosurus cristatus	Crested dog's tail	
Dactylis glomerata	Cocksfoot	
Festuca pratensis	Meadow fescue	
Festuca rubra	Red fescue	
Holcus lanatus	Yorkshire fog	
Phleum bertolonii	Timothy	
Poa pratensis	Smooth meadow grass	
Poa trivialis	Rough meadow grass	
Trisetum flavescens	Yellow oat grass	
Achillea millefolium	Yarrow	
Aegopodium podagraria	Ground elder	
Agrimonia eupatoria	Agrimony	
Anthriscus sylvestris	Cow parsley	Occasional
Arctium minus	Lesser burdock	Several individuals
Bellis perennis	Daisy	Frequent
Carex flacca	Glaucous sedge	
Centaurea nigra	Black knapweed	
Centaurea scabiosa	Greater knapweed	Occasional

Cerastium fontanum	Common mouse-ear	
Chamerion angustifolium	Rosebay willowherb	Occasional
Cirsium vulgare	Spear thistle	Several individuals
Clinopodium vulgare	Wild basil	Several individuals
Conopodium majus	Pignut	Several individuals
Crepis biennis	Rough hawksbeard	
Crepis capillaris	Smooth hawksbeard	Occasional
Daucus carota	Wild carrot	Occasional
Dipsacus fullonum	Teasel	Several individuals
Epilobium palustre	Marsh willow-herb	
Epilobium parviflorum	Small-flowered *w*illow-herb	
Galium aparine	Cleavers	
Galium verum	Lady's bedstraw	Abundant
Geranium molle	Dove's-foot crane's-bill	Frequent
Geranium robertianum	Herb robert	Several individuals
Glechoma hederacea	Ground ivy	Frequent
Heracleum sphondylium	Hogweed	
Hieracium pilosella	Mouse-ear hawkweed	
Hypericum perforatum.	Perforate St John's wort	Locally frequent
Iris foetidissima	Stinking iris	Several individuals
Juncus effusus	Soft rush	Several individuals
Knautia arvensis	Field scabious	Several individuals
Lamium album	White dead-nettle	Frequent
Lathyrus pratensis	Meadow vetchling	
Leontodon autumnalis	Autumn hawkbit	
Leontodon hispidus	Rough hawkbit	
L. taraxacoides	Lesser hawkbit	
Leucanthemum vulgare	Ox-eye daisy	Frequent
Linaria vulgaris	Common toadflax	Several individuals
Linum catharticum	Fairy flax	
Lotus corniculatus	Common Birds-foot trefoil	
Medicago lupulina	Black medick	Abundant
Mentha aquatica	Water mint	Occasional (wet hollow)
Odontites verna	Red bartsia	
Ononis repens	Restharrow	
Ophrys apifera	Bee orchid	
Origanum vulgare	Wild marjoram	
Orobanche sp.	Broomrape	
Pimpinella saxifraga	Burnet saxifrage	
Plantago lanceolata	Ribwort plantain	Frequent
Plantago major	Greater plantain	Occasional
Plantago media	Hoary plantain	
Potentilla reptans	Creeping cinquefoil	
Primula veris	Cowslip	
Primula vulgaris	Primrose	

Prunella vulgaris	Selfheal	Frequent
Pulicaria dysenterica	Common fleabane	Occasional (wet hollow)
Ranunculus acris	Meadow buttercup	
R. bulbosus	Bulbous buttercup	
Ranunculus repens	Creeping buttercup	
Rhinanthus major	Yellow rattle	
Rumex acetosa	Common sorrel	
Rumex obtusifolius	Broad-leaved dock	Occasional
Sanguisorba minor	Salad burnet	
Senecio jacobaea	Common ragwort	
Scabiosa columbaria	Small scabious	
Silene dioica	Red campion	Frequent
Taraxacum officinale (agg.)	Dandelion	Frequent
Trifolium dubium	Lesser trefoil	
Trifolium pratense	Red clover	Frequent
Trifolium repens	White clover	
Urtica dioica	Stinging nettle	Frequent
Verbascum thapsus	Great mullein	
Veronica chamaedrys	Germander speedwell	
Veronica serpyllifolia	Thyme leaved speedwell	
Vicia sativa	Common vetch	

Trees, shrubs and climbers

Acer campestre	Field maple	
Acer platanoides	Norway maple (planted)	Removed?
Acer pseudoplatanus	Sycamore	
Betula pendula	Silver birch (planted)	Several individuals
Bryonia dioica	White bryony	
Clematis vitalba	Traveller's joy	
Cornus sanguinea	Dogwood	
Corylus avellana	Hazel	
Crataegus monogyna	Hawthorn	Locally abundant
Fagus sylvatica	Beech (planted)	One individual
Fraxinus excelsior	Ash	
Hedera helix	Ivy	
Ligustrum vulgare	Wild privet	Locally frequent
Lonicera periclymenum	Honeysuckle	
Malus spp.	Cultivated apple (planted)	One individual
Prunus avium	Wild cherry (planted)	Several stands
Prunus spinosa	Blackthorn	Several individuals
Quercus robur	English oak	Several individuals
Rhamnus catharticus	Buckthorn	Several individuals
Rosa canina	Dog rose	Several individuals
Rubus fruticosus agg.	Bramble	Frequent
Salix alba	White willow	One mature individual

Salix caprea	Goat willow	One mature individual
Salix cinerea	Grey willow	
Salix fragilis	Crack willow	One individual
Sambucus nigra	Elder	
Solanum dulcamara	Woody nightshade	
Sorbus aucuparia	Rowan (planted)	Several individuals
Tamus communis	Black bryony	
Viburnum lantana	Wayfaring tree	Several individuals
Viburnum opulus	Guelder rose	Several individuals

FAUNA

Fish, amphibians and reptiles

Anguilla anguilla	Eel
Anguilis fragilis	Slow worm
Bufo bufo	Toad
Gasterosteus aculeatus	Three spined stickleback
Rana temporaria	Frog (1 record)
Natrix helvetica helvetica	Grass snake
Lissotriton vulgaris	Smooth newt
Triturus cristatus	Great crested newt (confirmed by eDNA sampling)

<u>Aquatic invertebrates</u>

Corixa punctata	Lesser water boatman
Daphnia spp.	Water flea
Gerris lacustris	Pond skater
Gyrinus natator	Whirligig beetle
Hydrarachna sp.	Water mite
Lymnaea stagnalis	Pond snail
Nepa cinerea	Water scorpion
Notonecta glauca	Greater water boatman
Planorbis planorbis	Ramshorn snail
Sialis lutaria	Alder fly
Sphaerium corneum	Pea mussel
	Blood worm
	Leech
	Mayfly nymph
	Cased caddis
	Diving beetle

<u>Odonata</u>

Aeshna cyanaea	Southern hawker
Anax imperator	Emperor dragonfly
Coenagrion puella	Azure damselfly
Enallagma cyathigerum	Common blue damselfly
Ischnura elegans	Blue-tailed damselfly

Libellula depressa	Broad-bodied chaser
Pyrrhosoma nymphula	Large red damselfly
Sympetrum striolatum	Common darter

Grassland invertebrates

Arion ater	Black slug
Arion hortensis	Garden slug
Cepaea nemoralis	Brown-lipped snail
Cernuela virgata	Striped snail
Deroceras reticulatum	Field slug
Helix aspersa	Common garden snail
Carabus violaceus	Violet ground beetle
Chorthippus parallelus	Meadow grasshopper
Lampyris noctiluca	Glow worm
Omocestus viridulus	Common green grasshopper
Pholidoptera griseoaptera	Dark bush cricket

Butterflies

Aglais urticae	Small tortoiseshell
Aphantopus hyperantus	Ringlet
Gonepteryx rhamni	Brimstone
Inachis io	Peacock
Lasiommata megera	Wall (1 record)
Maniola jurtina	Meadow brown
Melanargia galathea	Marbled white
Polyommatus hyperantus	Common blue
Pieris brassicae	Large white butterfly
Pararge aegeria	Speckled wood
Pyronia tithonus	Gatekeeper

Moths

Cucullia verbasci	The mullein
Tyria jacobaea	Cinnabar moth

Mammals

Vulpes vulpes	Fox
Meles meles	Badger
Oryctolagus cuniculus	Rabbit
Microtus agrestis	Short-tailed field vole

Birds

Accipiter nisus	Sparrowhawk (visitor)
Aegithalos caudatus	Long-tailed tit
Alcedo atthis	Kingfisher (occasional visitor)
Anas platyrhynchos	Mallard

Ardea cinerea	Heron (occasional visitor)
Carduelis carduelis	Goldfinch
Columba palumbus	Wood pigeon
Erithracus rubecula	Robin
Falco tinnunculus	Kestrel (hunting over)
Fringilla coelebs	Chaffinch
Gallinula chloropus	Moorhen
Hirundo rustica	Swallow
Cyanistes caeruleus	Blue tit
Parus major	Great tit
Phylloscopus collybita	Chiff chaff
Pica pica	Magpie
Picus viridis	Green woodpecker
Pyrrhula pyrrhula	Bullfinch
Sturnus vulgaris	Starling
Troglodytes troglodytes	Wren
Turdus merula	Blackbird
Turdus viscivorus	Mistle thrush

ANNUAL SITE SAFETY ASSESSMENT November 2022

Name of person carrying out the assessment:

Date of site visit and inspection:

Are each of the following in a safe condition and of sound construction?

Item	**Yes**	**No**
Entrance gate		
Signboard		
Seats		
Steps		
Fences		
Other:		

If the answer to any of the above is NO, please describe the hazard(s) and recommend the steps that should be taken to minimise the risk.

Item	**Hazard**	**Action recommended**

Is the rest of the reserve in a safe condition? Yes/No

If the answer is NO, indicate the unsafe section on a map, describe the hazard and recommend the steps that should be taken (NB all parts of the reserve must be walked and checked).

Are there any unsafe trees or branches? Yes/No

Are there any toxic/invasive plants requiring action to minimise risk? Yes/No

Action taken:

Action completed:

Signed off: **Date:**