

**MICKLEOVER MEADOWS
LNR AND MACKWORTH PARK

MANAGEMENT PLAN
2019 - 2028**

JAMES FRITH MCIEEM

Ecological Consultant

1 Ravensnest Cottages Ashover Chesterfield Derbyshire S45 0JP
E-mail: ravensnest@talktalk.net Tel: (01246) 591028

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Stage 1: Description

1.1 General Information

1.1.1 Location

The area covered by this management plan lies between the suburbs of Mickleover and Mackworth, some 3.2 km to the west of Derby City Centre. It covers the existing area of Mickleover Meadows Local Nature Reserve (LNR), included the previous Management Plan, plus the adjacent Mackworth Park that is proposed to be added to the LNR and included in the conservation management. This extension is an area of both managed amenity grassland and unmanaged land lying to the east of Mickleover Meadows. The grid reference is SK 3158 3566 (at Earlswood Drive entrance).

1.1.2 Summary Description

The 9.8-hectare site of Mickleover Meadows lies at a height of around 90 to 100 metres above sea level. It is bounded by the school buildings and grounds on the eastern side, by housing along the southern and part of the western boundary and by agricultural land to the west and north. The previous LNR Management Plan (2010 to 2015) covers just Mickleover Meadows.

Mackworth Park is linked to Mickleover Meadows by a surfaced path that is part of National Cycle Route 68. The exact boundary of the Mackworth Park area will depend on the proposed re-alignment route of the A38. The new Mackworth Park area is bounded by the A38 on the south and east, by the former railway line beyond which is housing to the north, and by the Murray Park Community School's sports fields to the west. It is proposed to include both Mickleover Meadows and Mackworth Park in this single updated ecological Management Plan.

The whole site consists of a variety of different habitats including areas of mown amenity grassland, grassland managed as hay meadows as well as unmanaged grassland with tall ruderal vegetation. There is both scattered and dense scrub, open ditches and small streams, several ponds, hedgerows, and broadleaved woodland.

The site's topsoils are clayey and are underlain by bedrock geology of Triassic rocks of the Mercia Mudstone Group. Historically all the land was farmland, giving rise to the current pattern of fields bounded by hedgerows. There is evidence of ridge and furrow in some areas, showing that the land was farmed by the practice of communal strip farming of large open village fields, which continued from Medieval times to the 18th or 19th centuries. Farming ceased in the 1970s and 1980s, after which the land was taken on by Derby City Council.

Mickleover Meadows has been managed as public open space with both mowing for amenity and conservation management. The Mackworth Park land has not been managed since farming was discontinued, and the vegetation has grown unchecked.

1.1.3 Land Tenure

Owner of the whole of the site (except the Homerton Vale field N at Mackworth Park): Derby City Council, The Council House, Corporation Street, Derby, DE1 2XJ.

The Mickleover Meadows LNR part of the site is managed by the Friends of Mickleover Meadows supported by Derby Parks Volunteers. The Mackworth Park area is not currently under any formal management.

1.1.4 Map Coverage

Ordnance Survey 1:50 000 Landranger Map Sheet 128

1:10 000 Sheets SK33 NW.

1.2 Environmental Information

1.2.1 Biological

1.2.1.1. Habitat Descriptions

There is a good range of habitats over both Mickleover Meadows and Mackworth Park. The main habitat types are:

- Grassland including mown amenity areas of improved grassland, semi-improved neutral grassland, species-poor semi-improved unmanaged grassland with tall ruderal vegetation;
- Scrub including scattered and dense areas;
- Hedgerows;
- Woodland of secondary semi-natural broadleaf woodland, plantation woodland and recent tree planting areas;
- Wetland, represented by small streams, open ditches and several small ponds.

These are shown on Plan 1, Compartments and Existing Habitats. More detailed descriptions of each habitat can be found in the Prescriptions section in Stage 3 under the relevant Compartment heading.

The compartment lettering and numbering for this plan is that of the previous (2010 to 2015) Management Plan for Mickleover Meadows and the labelling for Mackworth Park follows on sequentially from that.

1.2.1.2 Flora and Fauna

The ponds on site are known to support common frog. Smooth newt has also been recorded in one pond - the large pond in Compartment N in Mackworth Park adjacent to Girton Way.

The site lacks formal records of breeding birds, but sightings of birds include several that are of conservation concern (see Section 2.2).

Mammals recorded on site include wood mouse, field vole, fox, hedgehog, grey squirrel, weasel, brown rat and common shrew.

16 species of butterfly have been recorded.

21 species of trees and shrub and over 60 species of flowering plants plus over 20 species of grasses, sedges and rushes have been listed.

1.2.2 Cultural

1.2.2.1 Land Use

Mickleover Meadows and Mackworth Park are currently mostly used informally for walking, cycling and dog exercising. The site is very popular and many people walk their dogs there every day. A BMX track has been created at Mickleover Meadows and is maintained as an additional attraction. The Friends of Mickleover Meadows hold public events such as practical conservation tasks, guided walks and butterfly monitoring.

1.2.2.2 Public Interest

The designated multi-user path National Route 68 of the National Cycle Network, (part of the Pennine Cycleway) runs through the Mickleover Meadows and Mackworth Park. This is a traffic-free tarmac-surfaced path. The public have free unrestricted access to the whole area at all times and

there are informal paths and desire lines throughout. Some of the paths in Mickleover Meadows are surfaced and suitable for wheelchair-users. In Mackworth Park, including the area known locally as 'The Rough' however, apart from the one surfaced cycle route along the northern boundary, there are no suitable paths for wheelchair users.

Access is at several points: Mickleover Meadows can be accessed from Onslow Road (onto the national cycle route) and Earlswood Drive also has a paved path into the reserve. The north of the site can be accessed by a path from Richmond Park Road that links to the national cycle route. Greenwich Drive South in Mackworth has 3 paths that also link to Route 68 in the north of Mackworth Park. There is an informal access point via the sports field of Murray Park Community School. Homerton Vale to the south of the site has several access points on to a surfaced path through a small play area that leads to Mackworth Park.

An active and knowledgeable group, the Friends of Mickleover Meadows was formed in 2008 and is involved in the management of the Mickleover Meadows LNR part of the site. They group their activities into the categories of education, conservation and awareness. The group encourages participation in conservation events. These have recently included carrying out monitoring of the new butterfly bank; meadow walks; an evening bat walk and practical conservation tasks including hedge margin and pond maintenance work.

Stage 2: Evaluation and Objectives

2.1 Conservation status of the site

The site lies partly within Local Wildlife Site DE076. The register of Local Wildlife Sites (LWS) is maintained by Derbyshire Wildlife Trust and is a record of areas of non-statutory designation that have no legal protection but are identified as important for nature conservation. It is also partly within Local Nature Reserve (LNR) known as Mickleover Meadows, designated in 2010 and making the reserve one of the 62 LWS in the city and one of the 10 LNRs. LNRs are recognised for their wildlife features and are owned by Derby City Council with local people involved in their management.

Immediately adjacent to the north, but not part of the site, is LWS DE004 Mickleover Railway Cutting, designated for its habitat mosaic. DE014 to the south is LWS Bramble Brook and margins, designated for its secondary broad-leaved woodland.

Mackworth Park itself has no current status and is proposed for inclusion in the LNR.

The LNR designation gives legal protection to the site from development and also extends its use to the public - LNRs should be publicly accessible where this would not disturb wildlife.

The whole site is also within one of Derby's 'green wedges'. These are designated areas of undeveloped open land within the City providing an uninterrupted link to the countryside.

2.2 Evaluation of the features

The whole site covers an area of some 32 hectares, with a good variety of habitats within the site. Some of the habitats on site equate to UK BAP priority habitats, namely:

- Lowland mixed deciduous woodland
- Ponds
- Lowland meadow
- Hedgerows

The site with its variety of habitats and source of seeds in winter, looks to be important for birds but it is not known just how many species breed, over-winter or have been recorded on the reserve. Birds of Conservation Concern (BoCC) 2015 red list species known to be on the site are: grasshopper warbler, linnet, song thrush, tree sparrow and mistle thrush. Those on the amber list include reed bunting, dunnoek, bullfinch, kestrel, swift and tawny owl. Barn Owl is also recorded on site. This species was moved from the Amber List in 'Birds of Conservation Concern 4' to the Green List, but is still listed as a bird of Conservation Concern in the Birdlife International (2017) European Birds of Conservation Concern. This species is also listed under Schedule 1 of the Wildlife and Countryside Act 1981.

With the range of habitat types and the new butterfly bank providing an extra variety of butterfly habitat, the site is good for Lepidoptera, with 16 species of butterfly so far recorded, including purple hairstreak, 3 species of skipper; speckled wood and brimstone. 3 species of dragonfly have been observed.

Notable species recorded near to, but not on the site:

There are recent records of badger setts within 200 to 500 metres of the site, and the site has potential as foraging habitat for badgers, who have a foraging range of 30 ha to 150 ha. Badgers are not an endangered species, but they are among the most legally protected wild animals in the country. The UK has 25% of the global population of the Eurasian badger and every single sett helps protect the range of genetic variation within the UK population.

There are no confirmed records for great crested newt on the site, but there are 4 recently confirmed breeding ponds in Mickleover within a 500 metre buffer zone of Mickleover Meadows. Newts will typically travel up to 500 metres from a breeding pond.

There are 2 recorded bat roosts associated with buildings near to the site, one of brown long eared bats the other of pipistrelles. There are numerous anecdotal sightings of foraging bats on the site. The hedgerows, tall herb, woodlands, scrub and ponds all provide suitable foraging habitat for bats roosting on site or in the immediate area.

The only known significant plant species recorded is Various-leaved water-starwort, a rare native annual recorded in Millenium Pond at Mickleover in 2011. It is on the IUCN Red List but classed as 'least concern' as there are no major threats to its range. No systematic plant survey has been carried out recently, however.

2.3 Management Objectives

2.3.1 Objective: To maintain the existing habitats in favourable conservation status and enhance them where possible

See Plan 1 Existing Habitats and Compartments for compartment numbering.

As the Mickleover Meadows site has been well managed for biodiversity in the past, most of the structure here is close to optimal. There are however, some opportunities here and at Mackworth Park to enhance the structure for wildlife and increase the connectivity of semi-natural habitats.

Grassland

This refers to:

- The grassland on Mickleover Meadows managed as haymeadow (**Ai**, **Eii**, **B** and **Di**)
- All the tall grassland/tall ruderal vegetation areas on Compartments **J**, **K**, **L**, **M** and **N** at Mackworth Park and Compartments **C** and **F** at Mickleover Meadows.
- All the mown amenity areas (**Aii**, **Dii** and **Ei** at Mickleover Meadows and area **M** at Mackworth Park)

Grassland is the most extensive habitat on the site. The objective for the grassland areas as a whole is to manage them to provide a range of heights and structures to support a variety of habitat needs.

For the meadow areas the objective is to maintain as late-cut flower-rich sward offering nectar plants for invertebrates and cover for small mammals for as long as possible in the summer. Desire lines (informal 'shortcut' paths created by trampling) around and through the tall hay meadow grassland would be mown on a regular basis to allow access.

The aim is to maintain the tall grassland/tall ruderal vegetation at Mackworth Park as predominantly open tussocky grassland as habitat for grassland invertebrates and small mammals, as well as providing a source of food for birds. This could be achieved by scrub removal each year. An element of scrub should be retained and managed within these tall un-mown grassland areas to create a balance of scrub and open areas, aiming for approximately 5% scrub cover overall (except in Compartment **L** where the figure is 25%), and this should include a variety of scrub types. Tall ruderal vegetation refers to areas of tall non-woody rapidly colonising plants. This vegetation exists in a mosaic with tall grassland in areas **J**, **K**, **L**, and **N** and consists mainly of nettle, great willowherb, teasel and creeping thistle. The objective is to maintain the current structure of a diverse mixture of tall grasses and tall flowering plants as cover for birds, amphibians and small mammals at all times.

The remaining grassland areas - those in **Aii**, **Dii**, **Ei** and **M** - would continue to be regularly mown to provide short amenity grassland for public recreation.

Scrub

The term 'scrub' describes an area of land occupied by shrubs, saplings and young trees. Scrub on the site is widespread, both scattered and dense, in areas **J**, **K**, **L** and **N** at Mackworth as well as that colonising out from many of the hedgerows on both sites.

Scrub, particularly as a mosaic amongst tall grassland/tall ruderal vegetation, is an important habitat and can support a huge range of wildlife including birds and invertebrates. The aim is to maintain scrub at a balanced level and as a variable-aged resource with flowering and fruiting and some dead wood, while letting some light through to the ground. Scrub and tall hedgerows, particularly in conjunction with tussocky grassland, is an important habitat for several bird species. The best value scrub for wildlife has open areas with tall herbs and provides over-wintering sites for insects as well as seeds for birds. Ideally it is varied in height with sunny sheltered edges that retain warmth for insects.

Scrub should not be allowed to colonise areas that are being managed for the grassland interest.

Scrub will become denser and succeed naturally to broadleaved woodland if left unchecked, and the aim for some areas of scrub is to allow it to become woodland.

Woodland

This refers to compartment **H** in Mickleover Meadows and to **Jii** and **Jiii** within the former fields at Mackworth known locally as 'The Rough', as well as several small areas within the mown field **M**, excluding the areas having a more scrubby character, and old hedge lines.

In all these wooded areas, the aim is to allow the woodland to develop through natural succession without loss of area. Mature trees and the ivy on them should be kept, leaving all fallen timber and standing dead wood *in situ* unless this poses a safety hazard. Some small areas of recently planted trees in Compartment **M** should be grown on to maturity and should be enhanced by buffer strips.

Hedges These form an extensive network throughout the site and should be managed to keep as lines of mature shrubs providing shelter, flowers and fruit. One or two of the hedges could be traditionally laid in a long rotation, but the majority left to form tall dense hedgerows. Buffer strips with tussocky grassland, scrub and bramble alongside provides foraging habitat for birds.

Ponds

There are 4 existing ponds - the small ponds known as Millennium Pond, School Pond and Bridge Pond at Mickleover Meadows, and a larger pond in Compartment **N** at Mackworth Park. The goal for the existing ponds is to maintain them as potential amphibian breeding habitats with the same area of open water as at present and at least half the area of each pool free of emergent, floating or decaying vegetation, debris and litter. There should be some un-shaded banks and at least one of the ponds should remain water-holding until at least mid summer. Opportunities will be taken to enlarge some of the pond areas and replace fencing if funding is available.

Streams and ditches

The objective for the streams and open ditches is that they should be water-holding, be free of invasive plants, debris and litter; flowing freely at all times.

2.3.2 Objective: Capital Projects for Habitat Creation

Compared to the importance of maintaining the existing habitats, this objective can be considered as low priority. Opportunities for habitat creation however, are: 1. Following on from the success of the Mickleover Meadows butterfly bank, create an additional butterfly bank in Mackworth Park. 2. Creation of a new pond, also in Mackworth Park.

Open Water/Wetland creation

Creating a pond is thought to be the most cost-effective measure that can be made for conservation. For the benefit of amphibians, it would be advantageous to create one pond on the site that would reliably hold water to the end of the amphibian breeding season, that has suitable adjacent terrestrial habitat and is protected against damage and continual disturbance from dogs. This would mean permanently fencing it to prevent all public access from it. The exact location is to be decided on site at a later date. If it is not possible to protect a new pond from disturbance by dogs, it may not be worth creating a pond at all.

Butterfly Bank creation

Following on from the success of the limestone butterfly bank on Mickleover Meadows created in 2016, it would be beneficial to construct one in Mackworth Park as well. This could provide a successional source of larval food plants and nectar plants not found elsewhere on the site, as well as open sunny basking spots and bare ground for heat absorption. Localised bare ground areas are also important to solitary bees and to some species of wasp, spider and beetle, who need these areas to provide a warm micro-climate and easy tunneling.

2.3.3. Objective: Capital projects to provide access for all

Apart from the surfaced tracks in Mickleover Meadows and the paved cycle route along the northern edge of Mackworth Park, there is currently no wheelchair-accessible route through the majority of the site. It is proposed to create a wheelchair-friendly route through Mackworth Park and also to develop facilities for wheelchair users, for instance by providing suitable benches, and accessible picnic areas.

2.3.4 Objective: To encourage responsible use of the site

The whole site is very popular and regularly used by locals including dog walkers. This use should be encouraged. However, some aspects of this use have the potential to cause conflict with the conservation management and the needs of wildlife, if these needs are not well understood. It is important to raise awareness of these potential conflicts. These include disturbance caused by dogs in ponds. Signage and fencing has been only of limited success at Millennium Pond in Mickleover Meadows, and fencing is

sometimes deliberately damaged to allow dogs access in spite of the stated purpose as a wildlife area.

The Friends of Mickleover Meadows encourage active involvement in the reserve and the more involved the public is on the management of the site, the better the conservation message can be delivered. The programme of informal events and work parties should be continued and extended to other learning activities, if possible.

Access should continue to be managed. All signs, paths and 'desire lines' need to be checked and maintained. Rubbish needs to be collected regularly to reduce this as an eyesore and potential health hazard and so it does not become acceptable through familiarity.

Display boards are useful in explaining management works and wildlife interest and are important in getting the message across. These can be permanent and sited at access points, or temporary to explain practical management work such as hedge-laying, which can otherwise look drastic and be misunderstood. A more positive awareness campaign and better signage and notice boards would be helpful, and is planned.

Any damage, whether deliberate or accidental should be mended as soon as possible to demonstrate the caring attitude of the site managers and the majority of users of the site. Careful path design can allow access to the site but discourage activity in certain parts of it, such as near any new pond or butterfly bank.

Illegal use of the site by motorbikes is a problem here, as at several other parks in the city and affects the quiet enjoyment of visitors as well as causing ground damage and disturbance to wildlife. The Mickleover and Mackworth site with its large area, many access points and nearness to population centres makes it very difficult to police.

Once the management of the site is established, it could be assessed for a Green Flag Award, a prestigious award which recognises and rewards well managed parks and open spaces. This would bring with it many benefits, both status and pride and tangible benefits such as promoting the site and sharing good practice. Having a Green Flag Award is also a useful lever for obtaining external funding through improvement grants.

2.3.5 Objective: To carry out further survey and monitoring and formalise the record-keeping

There is some recent data about species at Mickleover Meadows but rather less known about Mackworth Park. There are some gaps in the recent status of fauna at Mickleover Meadows and further survey is needed, particularly of breeding birds.

It is also important to carry out regular monitoring of species and habitat condition to inform future management. Any new habitats such as the new pond should be monitored to determine its use and to assess it for repairs and aftercare. All records of fungi, wildflowers, mammals, insects, birds, butterflies and moths should be collated and added to a centrally-held website, curated by one person, and to which anyone can add their observations.

2.4 Description of Optimal State for the site

The ideal condition of Mickleover Meadows and Mackworth Park would be a long term continuation of the valuable mosaic of habitats already present, with each being maintained in the best condition for a variety of wildlife.

The grassland is the largest habitat on the site and ideally would have a range of structures to support different wildlife needs. This would include some coarse, un-mown tall tussocky vegetation which can provide valuable habitat for invertebrates, cover for small mammals and hunting ground for birds of prey. The current balance of mown amenity areas and taller grassland is about right. The hay meadows mown late in summer would support a greater range of herbs that look colourful and attractive and would in turn support more invertebrates including butterflies. Desire lines and informal paths through the tall tussocky and hay meadow grassland would be mown on a regular basis to allow access and kept away from tall grassy hedge margins. The remaining grassland areas would be managed as currently to provide short amenity grassland for public enjoyment.

The grassland would be maintained with a low level of scrub of around 5% overall, thus maximising the wildlife benefits of scrub and creating a balance between it and the grassland.

The areas of dense scrub would continue to have several native species of varying ages, providing food as well as protection for nesting birds. To be in the ideal state for wildlife, scrub would be managed to provide sunny sheltered edges that retain warmth, and be close to open areas of tussocky grassland, tall ruderals and bramble all of which are important for invertebrates.

The hedges are a fantastic feature of both parks and would be managed mostly as tall mature hedges with adjoining scrub and mature trees. For variety and longevity, one or two could be traditionally managed as laid or coppiced hedgerows. Hedgerows will continue to provide useful linkage habitat between wood and scrub areas.

Trees and the ivy on them will be retained. Woodlands, although small, would have a variety of tree ages, with all trees left to mature naturally. Ideally they would contain some dead wood, a shrub layer and a characteristic ground flora including the iconic native bluebell.

The existing ponds at Mickleover Meadows namely School Pond (P1), the small Bridge Pond (P2), Millennium Pond (P3) plus Pond P4 in field N adjacent to Homerton Vale should be water-holding until at least mid summer in order to provide suitable amphibian breeding habitat. In an ideal world they would be undisturbed, support a good range of oxygenating native aquatic and emergent plants and have unpolluted clear water, with at least some of it unshaded. They would be free of litter, debris, invasive non-native species, fish and debris. There would also be a new and well-designed designated wildlife pond at Mackworth Park, with a range of depths of water from warm shallows to deeper areas and be capable of holding water at least seasonally to support breeding amphibians. This will be completely undisturbed and with suitable amphibian terrestrial habitat around it.

The existing butterfly bank, plus a newly-created one in Mackworth would be maintained to provide open, sunny areas with some bare ground, rich in nectar-providing herbs that rely on nutrient-poor and disturbed ground, providing a range of food plants and breeding habitats for butterflies.

Access and public enjoyment for all would co-exist with the high ecological value of the area, and wheelchair access would be extended to include Mackworth Park, and all seating and picnic areas.
The ideal layout is shown on Plan 2, the Optimal State map.

Stage 3: Prescription

3.1 Project register and prescription

3.1.1. Habitat Management

Grassland

(a): Haymeadows

Description:

This refers to Compartments **Ai**, **B**, **Di** and **Eii** at Mickleover Meadows.

Compartment Ai has a mixture of grasses including sweet vernal-grass, crested dog's-tail, red fescue, cocksfoot, tufted hair-grass and common bent. Some of the herbs here originated as plug planting. It is not particularly herb-rich and herbs look to be in decline due to a 'thatch' or build-up of cut grass, but include bird's-foot-trefoil, meadow vetchling, common knapweed and yellow-rattle as well as the ubiquitous white clover, daisy and dandelion.

Compartment B is similar to Compartment **A** in terms of grass species, but is more obviously ridge and furrow and looks to be more species rich. It is currently mown once a year, but not all the cuttings look to be collected. In addition to the very widespread species as above, there are cowslips, common knapweed, bird's-foot-trefoil, great burnet and meadow crane's-bill.

Compartment Di The western half of Compartment **D**, called **Di** has ridge and furrow. Grasses here include sweet vernal-grass, common bent, crested dog's-tail and red fescue. Herbs include common knapweed, bird's-foot-trefoil, selfheal, ribwort plantain, red clover and meadow buttercup.

Eii 'Uffa Magna Meadow' lies on ridge and furrow and is similar to Compartment **D** in species composition.

Habitat Objectives:

- To manage with no loss of grassland area
- To maintain the species-richness of the haymeadow grassland through management by appropriate mowing.
- To enhance the species-richness by planting wildflower plants and plugs into the less flower-rich haymeadow areas (**Ai**, **Di** and **Eii**)
- To maintain access by mowing all paths and desire lines across and around meadows.
- Collate information on species to inform future management.

Prescriptions:

- Manage all meadow areas as at present by a single annual mowing in late August or early September. If possible, mimic traditional haymeadow management by leaving the mown grass to dry and turning it so the seeds drop out. It is essential to collect and remove the cuttings so they are not adding to fertility or physically suppressing plant growth.

- Leave at least 2 metres of un-mown margins against the hedges and woodland edges. To establish this with no encroachment of scrub, using hand tools or a tractor-mounted flail, cut the scrub and brambles from the margins once every 3 years in the autumn or winter. The grass does not have to be cut if the work is done by hand, the important thing is to control the bramble and scrub. Rotate the work so not all the margins are done in any one year, but cover the whole site on a 3-year rotation.
- Plant wildflower plugs or if funds allow, pot-grown plants in order to enrich the sward in species-poor areas such as Compartments **Ai**, **Di** and **Eii**. Suitable species to add include:
 - Cowslip (*Primula veris*)
 - Primrose (*Primula vulgaris*) - plant at edges near paths.
 - Field scabious (*Knautia arvensis*)
 - Lady's Bedstraw (*Galium verum*)
 - Rough Hawkbit (*Leontodon hispidus*)
 - Meadow Vetchling (*Lathyrus pratensis*)
 - Tufted vetch (*Vicia cracca*)
 - Great Burnet (*Sanguisorba officinalis*)
 - Wild carrot (*Daucus carota*)
- Seeding: Ox-eye Daisy (*Leucanthemum vulgare*) is an attractive meadow species that can establish well by seeding into small scarified areas - use hand scarifying/raking or a pedestrian scarifier. Manage as above and ensure the meadow has some small bare areas. This may need to be repeated every few years, as ox-eye daisy seeds best into open disturbed ground and does not thrive in the long term in a tall dense sward.
- Mow all informal paths and desire lines through meadows for a width of at least 1 metre and repeat fortnightly during the growing season. This could be done when the adjacent amenity grassland areas are mown.
- Continue to regularly mow 1 to 2 metres alongside all surfaced paths.
- Monitor meadows annually by a full species list survey and their frequency.

(b):Tall grassland

Description

The tall, tussocky, scrub-invaded grassland is the most extensive habitat on the site. This occurs in Compartments **J**, **K**, **L** and **N** at Mackworth Park and Compartments **C** and **F** at Mickleover Meadows. It also applies to the grassy margins to all hedgerows including alongside the path in Compartment **G** that forms the link between Mickleover Meadows and Mackworth Park. (See Plan 1, Compartments and Existing Habitats.)

Compartment C is a strip of tall grassland between the hedge and the path and also between the path and the BMX track. It is dominated by tall grasses, nettles and thistles and it has large sprawling patches of bramble.

Compartment F consists of unmanaged tall, tussocky grassland with grasses including couch, false oat-grass, cock's-foot and Yorkshire-fog with only a minor element of finer grasses such as common bent. Wildflowers are fairly limited, and consist of tall species such as creeping thistle, meadow buttercup, ragwort, knapweed and hogweed. Scrub is scattered and the boundaries are

tall hedges with bramble, now extending into the field. Although not flower-rich, the value here is in its worth as an invertebrate habitat, as cover for small mammals and as hunting ground for barn owls and other raptors.

Compartment G is the strip of tall, bramble-invaded grassland lying alongside hedge H5, and the mown strip adjacent to the path. It consists mostly of oat-grass, cock's-foot, cow parsley, nettle and creeping thistle, with brambles growing out from the hedge into it.

Compartment J is a large former agricultural field now unmanaged. It is an area of mostly open species-poor grassland and tall herb vegetation. The grasses are mainly tall coarse species including couch, cock's-foot, false oat-grass and Yorkshire-fog. Tall herb vegetation includes cow parsley, broad-leaved dock, hogweed, locally frequent great willowherb, rosebay willowherb and creeping thistle. There is occasional wild carrot and tufted vetch. There is scattered scrub of ash and oak saplings, hawthorn and bramble, as well as denser areas of ash saplings, some looking to be suffering from ash dieback. The blocks of self-set ash adjacent to the lower perimeter path (labelled **Ji** on Plan 1) should be left to develop into woodland.

Compartment K is similarly a tall grass/tall herb area, but looks to be wetter and also has areas of dense ash saplings. The central, more open area, called **Ki** consists of mostly coarse grasses, including tufted hairgrass, false oat-grass, couch and cock's-foot with ragwort, wild carrot, soft rush, and creeping thistle. Large areas are dominated by great willowherb. There is scattered scrub of ash, field maple, wild rose, hawthorn, and bramble. There has been some informal trimming of hawthorns near the path, otherwise this field has been long un-managed.

Compartment L has a roughly central fairly open area of tall grassland similar to **J** and **K** described above. There is approximately 25% scrub in field **L**, consisting of both dense blocks and scattered scrub. The species are oak, hawthorn, goat willow and saplings of ash. There are informal paths throughout. The tall grass/tall herb vegetation is of couch, cock's-foot, creeping buttercup, great willowherb, broad-leaved dock, and some tufted vetch and bush vetch.

Compartment N is perhaps the most open area of tall grassland on the site, having very little scrub and tall herb. There is a crushed stone and glass debris surfaced path, several informal trodden paths, standard tree planting in small groups and a large pond within this field. The grasses are mostly couch, cock's-foot and timothy with creeping thistle, hogweed and broad-leaved dock. An area near the pond is more species-rich with wild carrot, ox-eye daisy, ribwort plantain and abundant teasel. The strip between the surfaced path and the trees lining Bramble Brook is tall ruderal vegetation mostly great willowherb with Himalayan balsam, creeping thistle, hogweed and nettle.

While not being particularly herb-rich, all the tall tussocky grassland areas provide a habitat for small mammals, for invertebrates that over-winter as part of their life-cycle and for wildflowers to set seed. This habitat with seed-bearing plants is of huge benefit to birds, particularly over-wintering species. Key species to benefit from this habitat are yellowhammer, reed bunting, linnet and tree sparrow. Tussocky grassland also has a value to barn owls and other raptors as a foraging area.

It is likely that the tall grassland itself, except for scrub colonisation, is fairly stable and will not change. This will allow it to be managed by total non-intervention - the best conservation practice is to leave it alone.

Habitat Objectives:

- Maintain as open field of tall grasses and tall herb as a valuable cover for small mammals, a winter food source for seed-eating birds and hunting ground for birds of prey, including the barn owls known to be breeding on site.
- Keep scattered scrub and blocks of bramble to an maximum average of 5% (25% for Compartment **L**) of the open tall grassland/tall ruderal areas.
- Establish a tall grass margin around all woods and copses and alongside hedges by leaving un-mown and controlling the encroaching scrub. These grassy margins will be used by longer-lived invertebrates such as grasshoppers, as well as voles and other small mammals whose life cycle would be disrupted by annual mowing.
- Enhance the tall grassland for over-wintering birds by planting seed-bearing species that can hold their own in tall coarse vegetation so that it will be rich in insects and seeds throughout the year.
- The tall grassland areas in Compartment **M** amongst the tree planting have potential for enhancement by extending them to at least 2 to 3 metres wide and planting pot-grown plants of suitable species. This is a low priority boosting effect that will depend on future funding.
- Manage the grassland itself by non-intervention if the species composition does not change.
- Inform future management by carrying out monitoring of the tall grassland annually.
- Maintain the records on a central database for a year on year comparison.

Prescriptions:

(See also scrub section below where prescriptions are identical)

- **Compartment J:** Remove individual saplings, bramble patches and hawthorn shrubs, leaving around **5%** cover (not including **Ji**, the dense scrub area chosen to succeed to woodland.) When selecting the 5% to be retained, favour the older, more established hawthorn and a few dense patches of bramble. Treat cut stumps with an approved herbicide and method that minimises risks to the environment, for instance use of an 'eco-plug' of herbicide. Use a scrub-cutter around the bramble patch margins every year to prevent an increase in area.
- **Compartment K:** Remove individual saplings, bramble patches and shrubs of all species, leaving around **5%** cover (not including **Kii** and **Kiii**, the dense scrub areas chosen to succeed to woodland.) When selecting the 5% to be retained, favour the older, more established hawthorn and a few dense patches of bramble. Up to 6 specimen (non-ash) young trees can be left to grow on and mature.

- **Compartment L:** Remove individual oak and ash saplings, willow, bramble patches and hawthorn shrubs, to leave around **25%** cover (not including **Li** and **Lii**, the dense scrub areas chosen to succeed to woodland.) The scrub work should be done in late autumn and early winter and is a suitable task for a volunteer group.
- Monitor scrub and bramble re-growth and continue to control scrub annually by hand cutting during the winter months and spot-treating the cut stumps of the scrub with an approved herbicide.
- Brashing piles can be left to form habitat stacks and rot down over time. Any bramble growing through the brashing piles can be left. If a huge volume is produced, excess brashing can be chipped or stacked in piles on site to rot down.
- Where paths through the tall grassland are currently mown right up against the hedge, re-create them further in to the field to leave a margin of tall grassland alongside the hedge.
- Carry out an autumn cut of tall grassland margins of hedges no more frequently than 1 year in 3 to prevent scrub and bramble establishing. This can be done by hand or tractor-mounted flail mower. Brashing can be chipped or stacked in piles on site to rot down.
- Avoid managing all the grassland strips in the same year. Instead mow in autumn on a rotation so there are always some un-mown.
- Continue to control scrub and bramble annually by hand-cutting during the winter months and treating the cut stumps as above.
- Monitor the grassland for any changes in species composition to inform future management.
- To enhance the species diversity of tall grassland areas, plus any margins to woodlands, copses and hedges, plant pot-grown plants suitable for the soils and that can hold their own in tall coarse vegetation. Such species could include
 - Yarrow (*Achillea millefolium*)
 - Common knapweed (*Centaurea nigra*)
 - Great burnet (*Sanguisorba officinalis*)
 - Agrimony (*Agrimonia eupatoria*)
 - Red campion (*Silene dioica*)
 - Foxglove (*Digitalis purpurea*)
 - Nettle-leaved bellflower (*Campanula trachelium*)
 - Meadowsweet (*Filipendula vulgaris*)
 - Teasel (*Dipsacus fullonum*)
 - Meadow buttercup (*Ranunculus acris*)
 - Wild carrot (*Daucus carota*)
 - Common mallow (*Malva sylvestris*)
 - Valerian (*Valeriana officinalis*)
 - Meadow cranesbill (*Geranium pratense*)
 - Ox-eye daisy (*Leucanthemum vulgare*) - has low tolerance to shading by other vegetation, but is useful to a range of pollinating insects, so worth adding in more open areas.
- Mow all the informal grassy paths regularly in summer and remove the cuttings. Perimeter paths should be several metres away from

the hedges and 2 to 3 metres wide (not as currently, where in places, where they are up to 5 metres wide and up against the hedge)

- Continue to mow no more than 1 to 2 metre width strip at the sides of the tarmac path, and do the same for any new multi-user access routes.
- Continue to remove litter.
- Monitor tall grassland annually by carrying out a full species survey and keeping the records on a central database for a year on year comparison to inform future management.

(c): Butterfly Bank

Description:

Created in 2016 and expanded in 2017, the butterfly bank at Mickleover Meadows was made using 20 tons of imported limestone aggregate, used as this is a low fertility substrate not found on site. It was planted with wildflowers that provide nectar and larval foodplants for butterflies. Species planted included kidney vetch, field scabious, greater knapweed, common dog violet, cowslip and bird's-foot trefoil. It has regularly been cleared of grass and maintained to have some bare soil areas.

Habitat Objectives:

- Maintain existing area of bank with no encroachment of vegetation from the edges.
- Maintain bank at early successional stages to provide the bare ground and open vegetation preferred by butterflies.
- Maintain free of all undesirable species and any dominance of grasses that would overwhelm the butterfly plants.
- Several common species of butterflies including Essex, small and large skippers, meadow brown, gatekeeper, and speckled wood feed on grasses so, to complement the butterfly bank leave an area of grass un-mown adjacent to the north so shading is not an issue.
- Several less commonly-seen species can easily be targeted and supported by providing their foodplants eg bird's-foot trefoil for the dingy skipper and common blue and sorrel for small copper.
- Monitor to gather data on invertebrates and vegetation changes.

Prescriptions:

- Continue to manage the butterfly bank every year so it maintains the same area, has some open ground and is free of dominant plants. This will involve hand cutting or pulling tall competitive species several times during the growing season. Tussocks of grass can be removed to provide open ground. Remove cut material from site. Aim for around 50% bare ground.
- Cut using hand tools once every autumn to remove the dead thatch of plant material that may affect the next year's growth. Remove cut material from immediate area.

- Leave an area of grass un-mown to the north of the bank and manage this by a single autumn cut and remove the cut material. Allow all herb growth of dock, nettle, thistle etc in this area.
- Add common sorrel to the bank or grass margin.
- Monitor butterfly species and numbers every year, ideally by transect across the mound and surrounding area, to gather data on invertebrates and vegetation changes.

(d): Improved Amenity Grassland

The remaining grassland i.e. that in Compartments **Aii**, **Dii**, **Eii** and **M** is species-poor amenity grassland. It is dominated by perennial rye-grass, with common bent and Yorkshire-fog and a very limited range of common herbs including creeping buttercup, daisy and white clover. It currently gets regularly mown throughout the growing season by a tractor-mounted mower, which keeps it at 2 cm to 5 cm high. There is no conservation management-led input to the timing of this, and the cuttings are left *in situ*. It is not completely without conservation value however, as birds such as starlings that feed on earthworms and other soil invertebrates prefer short grassland of 5 cm or less.

There are no additional management needs, but it would be of great benefit to wildlife to leave an un-mown perimeter around the edges of the close-mown fields against the hedges and around the copses in **M**.

Scrub

Description:

This section deals with the denser blocks of scrub that occur. Scattered scrub elsewhere is dealt with under the grassland prescriptions.

Huge thickets and lines of blackthorn have colonised from the old hedgerows. Compartments **J**, **K** and **L** have dense areas of ash saplings that are currently considered as scrub, but suitable for allowing to succeed naturally to woodland. These areas are **Ji**, **Kii**, **Kiii**, **Li** and **Liii** (see Plan 1).

Habitat Objectives:

- Control scrub at the desired levels - the dense scrub should not be allowed to spread into adjacent areas that are being managed for the grassland interest. It is a successional habitat, i.e. a temporary stage of the natural progression from open grassland to woodland, so needs to be kept at an appropriate level of cover.
- Create deadwood habitats with the brashing.
- Work in such a way and at such a time so as to minimise the effect on wildlife.
- Allow some of the dense scrub to succeed naturally to woodland.
- Maintain the young ash stands by non-intervention to assess the effects of ash dieback.
- Inform the public by signage or other method saying what the scrub cutting work involves and why it is necessary.
- Inform future management by monitoring.

Prescriptions:

- Do *not* remove any shrubs or saplings from within areas **Ji**, **Kii**, **Kiii**, **Li** or **Liii**. (see Plan 1)
- Carry out annual monitoring by full plant surveys with frequencies, to assess change and inform future management.

Woodland*Description:*

Woodland H lies along the southern and south-western edge of fields **E** and **A** at Mickleover Meadows. There is a good variety of broadleaf species in the canopy including ash, oak, field maple, birch, blackthorn and lime plus a few Scot's pine. Shrubs include dogwood, guelder rose and elder. It is densely shaded with areas of bare ground with few woodland plants of ivy, red campion and wood avens. Where it is less shaded and towards the edges there is bramble. Near the school there are some hybrid poplar trees over tall grassland but no shrubs or woodland ground flora.

Woodland Jii is a belt of woodland along the southern boundary of Compartment **J**. It forms a dense impenetrable strip of ash, crack willow, bramble and alder. Some of the crack willow is mature and falling apart, particularly by the path into Compartment **L**, where 2 large crack willows are fallen and caught and partly blocking the path.

Woodland Jiii is a small wet wood in the north east corner of field **J**, adjacent to the surfaced path. It consists of crack willow with hawthorn, blackthorn, ash saplings and elder. It is a tangled and dense area with plenty of bramble and lying wood and some of the willows have fallen and caught branches. The ground flora includes thistle, hogweed, great willowherb and broad buckler fern. There is a large multi-stem ash some 4 metres from the path and overhanging it.

M1 is a strip of woodland alongside the surfaced path along the northern boundary of Compartment **M**. Canopy species consists of aspen, some with ivy; ash, Scots pine, beech and occasional holly. There is a sparse shrub layer of hawthorn, sycamore and elder. The open ground flora is open and made up of ivy, cow parsley and bramble.

M2 is a central area of field **M** with young planted and self-set trees and shrubs of hawthorn, silver birch, guelder rose, ash, oak and field maple. The un-mown area around the edge of the tree planting area is of couch, cock's-foot, Yorkshire fog, great willowherb, hard rush and broad-leaved dock.

M3 is a very small area of mature aspen, densely suckering and with ivy covering the ground and on the trunks. There is the occasional ash sapling and a single laurel and holly. It is currently mown round.

M4 is a small woodland adjacent to hedge H10. It consists of dense field maple, with hawthorn and elder understorey. Ivy covers the woodland floor and many of the tree trunks.

M5 is a small block of plantation woodland of mostly ash and aspen, with Scots pine and silver birch with trampled paths and motorbike tracks throughout. The ground beneath the trees is very shaded with areas of bare soil and a sparse cover of vegetation mostly ivy and cow parsley. There is a central 9 metre swathe felled and piles of brashing cut and stacked in

preparation for a proposed new surfaced path through the south-eastern part of Mackworth Park.

M6 is a recent tree and shrub planting area in un-mown grassland. Tree species include field maple, guelder rose, hawthorn, silver birch and oak. Between the trees the tall grassland is dominated by perennial rye-grass with common bent and Yorkshire-fog and a low proportion of herbs.

M7 is mixed deciduous plantation woodland with a swathe through it felled and trimmed back.

M8 is a new mixed deciduous tree and shrub planting area adjacent to hedge H11. It consists of birch, hawthorn, alder, guelder rose and oak in un-mown grassland.

M9 is a band of scrubby woodland lining the course of the Bramble Brook at the southern end of Compartment **M**. It expands into a larger area of immature broadleaved woodland where the small tributary S2 enters the brook some 200 m from the southern end. The woodland has a high proportion of scrub with only a limited canopy of taller trees. There are large mature hawthorn, hazel and field maple throughout. Blackthorn forms dense stands on the margins in places. The dense shade has limited the ground flora which consists mostly of ivy, with cow parsley, herb-Robert, hogweed and male-fern.

M10 is a young plantation copse of beech, lime, field maple, guelder rose and hawthorn 1.5 to 2 metres tall in long grass.

Habitat Objectives:

- To maintain all the wooded areas with no reduction in area of woodland habitat. Dead standing trees and fallen timber is to be retained as a valuable habitat for fungi and invertebrates.
- The aim is to have sufficient natural regeneration to maintain a diversity of native trees in the canopy and understorey.
- Retain bramble at current levels in the woodlands.
- Create and maintain a 'soft' i.e. shrubby woodland edge structure wherever practicable.
- Maintain a balance of open scrub and bramble at wood edges.
- Leave a larger area of un-mown grass around the woods and copses to enhance them as cover for invertebrates and small mammals. It would also help protect them from accidental damage to their root system by mowing and leave associated fungi undisturbed.
- Provide opportunities for hole-nesting birds currently limited throughout the woodland, to benefit the bird population.
- Provide opportunities for bats to roost, currently limited by the lack of mature and veteran trees with suitable cracks, holes etc.
- Enhance the woodland ground flora where practicable and where funding allows by planting woodland species bulbs such as the native bluebell.
- Enhance the woodland structure of areas where this is poor, such as the eastern end of Woodland **H** at Mickleover Meadows, which lacks shrubs.

- The edges of most woodlands at Mackworth Park could also be enhanced by planting shrubs to create a soft edge.
- By non-intervention, allow the natural succession of some of the scrub and the dense ash sapling areas within several of the compartments in Mackworth Park, namely **Ji**, **Li**, **Liii**, **Ki** and **Kiii** to succeed naturally to woodland.
- Inform future management of the woodlands by monitoring the spread of ash dieback regularly.
- Monitor all woodlands to assess for future management and safety work.

Prescriptions

Maintenance:

- The established areas of woodland need no special management, as they are best left to develop naturally, even if ash dieback does occur. Litter should be collected regularly from all areas.
- Retain all canopy trees, including leaving all the ivy on them, all fallen timber and standing dead wood, unless there is a safety issue or branches block paths.
- Carry out safety checks and work such as any necessary coppicing or bough removal on all trees near to and overhanging the surfaced path, such as the multi-stem ash near wood **Jiii** and the crack willows on the path between Compartments **J** and **L**. Stack any cut timber into piles as habitat stacks.

Enhancement:

- Plant bluebell bulbs in any woodland to enhance the ground flora. Ensure any bulbs planted are of local provenance and are the native bluebell (*Hyacinthoides non-scripta*) and not the introduced Spanish bluebell (*Hyacinthoides hispanica*). Simply plant as many as funding allows, at irregular spacings, well spread out and leave to naturalise. Plant in autumn at twice the depth of the bulb. Other plants suitable for naturalising in woodland to enhance the ground flora are wild garlic (*Allium ursinum*) and red campion (*Silene dioica*).
- Remove the clumps of Spanish bluebell from wood **H** and anywhere else where this is seen.
- Plant shrubs to enhance woodland margins in Compartment **M**. Suitable species include field maple, hawthorn, guelder rose and hazel. Planting should take place in late autumn or winter. Plant bare-rooted whips of 90cm to 120 cm at 2 m x 2 m spacing. Weed around each stem for the first three summers to remove competition for moisture from grasses.
- Do not cut the scrub and the dense ash sapling areas within several of the compartments in Mackworth Park, namely **Ji**, **Li**, **Liii**, **Ki** and **Kiii** (see Plan 1) to allow them to succeed naturally to woodland.
- Erect nest boxes where they are sheltered and most likely to succeed, depending on the target species. These should be numbered and

mapped. Kestrel boxes are recommended, but do not erect tawny owl boxes. (They defend their territories to the detriment of barn owls)

- Erect bat boxes as high as possible on large limbs of suitable trees.
- Maintain nest boxes in the woodland compartments by clearing them of debris every year in winter, preferably no later than early January, and if necessary protect from woodpecker and squirrel damage by reinforcing the entrance hole with a metal strip.
- Maintain all current and any new bat boxes - this will need to be done by a qualified and licensed bat worker.
- Monitor the spread of ash dieback over the whole site to inform future management needs.
- Monitor all woodlands to assess for future management and safety work.

Ponds

Description:

Pond 1 The School Pond is a ditch-fed pond about 10 metres x 15 metres. It is in a small wooded area and shaded by the surrounding mature trees. There is little in the way of aquatic vegetation but for some common duckweed and common water-starwort. The margins have fool's water-cress, brooklime, floating sweet-grass and soft rush and the banks have vegetation including bittersweet, nettle, creeping buttercup, red campion, hedge woundwort and ivy. The pond suffers from some vandalism and dumping of rubbish and debris and dries out completely each summer. A great deal of work is done every year to keep it open, debris-free and litter-free and the banks clear of scrub.

Pond 2 The Bridge Pond was not considered a pond but a widened ditch area in the Mickleover Meadows Ponds Report of 2011, but is included here as it has potential for improvement. A stream runs through the middle, but otherwise it is completely filled with common reed. There is some brooklime and floating sweet-grass. The common reed has some willow scrub developing within it. The banks are grassy with soft rush and great willowherb.

Pond 3 Millennium Pond lies in the north-west corner of Field **E** and has hedges on 2 sides with a fence all around it. Created in 2009, it was left to colonise naturally, but some plants may have been introduced. The fence is now becoming dilapidated and damaged and the pond suffers from continual disturbance from dogs and as a result the water is permanently muddied and turbid. It supports curled pondweed, common duckweed and has a large clump of reedmace. Marginal vegetation includes hard rush and soft rush. The vegetation within the fenced enclosure includes great willowherb, tall grasses and some bramble and blackthorn that look to be colonising from the hedges.

Pond 4 Homerton Vale Pond lies in Compartment **N** in Mackworth Park. It was created to collect run-off from the nearby housing of Girton Way and is the largest pond on site. It is fringed by a band of dominant reedmace with some great willowherb and hard rush and lies amongst tall grassland. It looks

to be permanently water-holding and is known to support smooth newt and common frog. Its Habitat Suitability Index (HSI), a measure of the habitat suitability for supporting great crested newt is 'excellent', but none have been recorded as being present. It supports breeding coot and reed bunting.

Habitat Objectives:

- **All ponds** - Provide updated information annually to enable assessment of the effectiveness of management of all ponds and review as necessary.
- **Pond 1 The School Pond** - Maintain as water-holding until mid-summer, at least partly un-shaded and free of debris with banks free of trees and scrub.
- **Pond 2 The Bridge Pond** - allow to develop as a reed bed to keep the water clean further downstream, where Pond 1 lies. If possible enlarge the reed bed area.
- **Pond 3 Millennium Pond** - protect from disturbance and reduce/remove the colonising reedmace - the pond is too small to support the reedmace's invasive habit. Provide amphibian terrestrial habitat maintaining the tussocky grassland around the pond.
- **Pond 4 Homerton Vale Pond** Maintain the current area of open water. Maintain extent of reedmace ('bulrush') at current level as an important reed bunting habitat. Prevent eventual natural succession to swamp, and the pond drying out by removing colonising willow saplings. Keep the area around the pond as tall un-shaded, unmown grassland.

Prescriptions:

Pond 1 The School Pond

- Continue the annual task of clearing out all debris, rubbish and litter from the pond and keep the banks free of scrub and saplings. It would be beneficial to keep it topped up with water from the ditch by creating weirs of logs, stone etc in the ditch.

Pond 2 The Bridge Pond

- If funds and labour allow, this pond could be enlarged and then allowed to fill with common reed to act as a reed bed filter to water flowing downstream. Remove all encroaching willow scrub from the pond surrounds annually.

Pond 3 Millennium Pond

- Renew the fencing around the pond within the next 5 years.
- Control the reedmace. If possible remove it altogether and take it off site. It will probably grow back from tubers however and be an ongoing annual control task.
- Once every 2 to 3 years, using hand tools, cut the surrounding grassland to control scrub and bramble. Work in autumn/winter. Remove cuttings.
- Clear out all debris, rubbish and litter from the pond.
- Maintain at least half the pond area of open water by vegetation removal. Leave on banks to rot down for 24 hours then remove.
- Deepen the pond at one end.

Pond 4 Homerton Vale Pond

The flood defense team are to maintain this pond:

- Maintain extent of reedmace ('bulrush') at current level or less. Remove the reedmace where it is colonising into the pond, when advised by monitoring to be necessary. Work should be carried out between 31 October and 1 February.
- Remove any colonising willow saplings from the pond banks amongst the reedmace and from within the pond itself. Work in winter (November - February)
- Remove all rubbish regularly, avoiding disturbance during the amphibian breeding season i.e. February to July. There should be no mowing around the pond or in the tall grassland, and no further tree planting anywhere near the pond.

All Ponds

- PSYM (**P**redictive **S**ystem for **M**ultimetrics) surveys of all the ponds should be carried out during June, July or August. This standard method provides an assessment of the ecological quality of a site compared to ponds nationally. It requires basic environmental information including identification of the plant species and invertebrate groups found at the site.
- Report any amphibian records to the County Recorder.

Streams and Ditches

Description:

Bramble Brook - one 'arm' of the Bramble Brook starts a little upstream of New Pond and runs east across Mickleover Meadows. It forms the south and eastern boundary of field **J** in Mackworth Park. It then runs adjacent to the cycleway at the northern edge of **L**, **K** and **M**, and is culverted under the northbound lane of the A38.

The brook marked **S1** forms the western and southern boundary of Compartment **L** and the southern boundary of Compartment **K**. It flows alongside hedges and mature trees and it is stagnant and backing up, blocked by dams, waste material, detritus, tree branches etc. There is a large amount of litter both in and alongside it. The culvert under the bridge at the southern end between fields **J** and **L** is blocked. This small watercourse flows across Compartment **M** where it joins the other 'arm' of Bramble Brook which is then culverted under the A38.

S2 is a small tributary to Bramble Brook and flows within hedge H11 between Compartments **K** and **M**. This has a steep-sided channel up to 2 m wide and 1.5 m deep with no submerged or emergent aquatic species present. It flows as a slow trickle only and is in dense shade. The flow is held back by scrap and rubbish, dams, branches and fallen trees, forming a series of stagnant pools. Vegetation on the banks and sides is typical woodland ground flora including wood avens, ivy, liverworts and mosses, wild garlic and red campion.

Other minor ditches and seasonal drains run through the site, but are not considered separately.

Habitat Objectives:

- Maintain the network of wet ditches and brooks on the site so that they can retain flowing water all year.
- Maintain a clear clean water flow free of pollution.

Prescriptions:

- Collect and remove from site all the litter, rubbish, scrap and non-organic material from the main waterways on the site listed above.
- Leave fallen logs to hold back the water naturally.
- Unblock or re-instate the culvert beneath the bridge between compartments **J** and **L**.
- Do not use any herbicide within 5 metres of the banks.

Hedgerows

Description: The hedges on site are former agricultural land boundaries, now mostly outgrown rows of mature hawthorns with some established trees. Most hedgerows have sprawling patches of blackthorn and/or bramble colonising from them.

Hedges H1 to H8 are at Mickleover Meadows, the rest are at Mackworth Park. The mature trees within the hedges add to the ecological value. One such tree has a barn owl box; several others have bat boxes.

Hedge H1. This is a mostly un-managed hedge some 5 metres tall and 4 to 6 metres wide alongside the access path from Eastwood Drive. It is mainly blackthorn with occasional hawthorn and ash trees. The hedge has mostly bare ground beneath but has some dense patches of ivy and occasional woodland species including wood avens, cleavers and cuckoo pint.

Hedge H2 is a wide mostly un-managed hedge of tall shrubs and mature trees alongside the ditch/stream. The trees are of ash, crack willow and oak. It sprawls to over 12 metres wide in places and consists of dominant blackthorn with occasional hazel, elder, hawthorn and wild rose. The blackthorn is rapidly colonising the tall grassy margins and is controlled by volunteer groups cutting it back using hand tools and removing the cuttings. The hedge ground flora is occasional ivy, cow parsley, cleavers and nettle.

Hedge H3 refers to hedges on all sides of Compartment **D**, the BMX field. They are all tall and un-managed, up to 8 metres tall and 6 to 8 metres wide with frequent standard trees up to 12 m tall. It is mostly of outgrown hawthorns with dense patches of blackthorn and occasional holly and elder. The mature standard trees are ash and a few oak. The dense shading allows for very few plants under the hedge itself, but the tall grassland margins have bramble and tall herbs and grasses including cock's-foot, false oat-grass, nettle, cow parsley, creeping thistle, hogweed and broad-leaved dock. There is a barn owl box in a mature ash tree at the entrance to Compartment **F**, as well as some bat boxes.

Hedge H4 is a tall un-managed hedge found along 2 sides of field **F**. It consists mostly of hawthorn to 5 metres tall with occasional ash, blackthorn and elder. The dense shading allows few plants under the hedge, which extends to 4 metres wide with some sprawling patches of bramble extending

further out. Alongside the hedge the tall grassy margins have tall herbs and grasses including cock's-foot, false oat-grass, broad-leaved dock, nettle and great willowherb.

Hedge H5 lies alongside the path linking Mickleover Meadows to Mackworth Park. It is a tall dense hedgerow of mature hawthorn with plenty of ivy. It has no conservation-led management, being flailed on the path side with the tall grass/tall herb, brambly hedge margins also flail-mown right up to the hedge base.

Hedge H6 runs along the northern boundary of fields **A** and **E** and has a ditch within it. Of mostly hawthorn with bramble and ivy, it is up to 6 metres tall and is un-managed, sprawling to 8 metres wide. There are ash trees within it and the new pond constructed adjacent to the western end. The grassy margins have false oat-grass and cow parsley.

Hedge H7 lies along the western boundary of field **Ei**. It is tall and unmanaged reaching up to 6 metres tall and 6 to 8 metres thick with sprawling patches of dense bramble. The hedge is mostly made up of hawthorn, with blackthorn, elder, bramble and wild rose. At the southern end it has mature ash trees and adjoins the back of the adjacent gardens.

Hedge H8 is the boundary between fields **A** and **E**. It is tall and unmanaged, consisting of mainly blackthorn with hawthorn, elder and wild rose. Blackthorn extends from it at the southern end.

Hedge H9 lies between Compartments **K** and **L** at Mackworth Park. It is a line of mature un-managed hawthorn with mature ivy and suckering blackthorn. Some informal clearance of blackthorn has been done to define the hedge line.

Hedge 10 is a line of mature leggy hawthorn up to 5 metres tall, with occasional elder, bramble and blackthorn. Beneath the hedge is ivy and the margins have nettle and cow parsley. A section of the hedge and the adjacent copse have been cleared to prepare for a proposed new paved access path. At the southern end the hedge extends out into a dense stand of blackthorn.

Hedge 11 is a line of overgrown hawthorn and blackthorn, some suckering and forming thickets, with a strip of mature ash adjacent at the southern end. It is known to be old, as it appears on the Ordnance Survey First Edition maps dated 1882.

Hedge 12 lies on the western side of Compartment **L** against the school playing field railings. It is outgrown hawthorn, sprawling bramble patches and suckering blackthorn with some mature ash trees at the southern end. There is an unsurfaced informal path alongside this hedge.

Hedge 13 lies on the western side of Compartment **N** against sports fields. It is outgrown hawthorn some 6 metres tall and 6 metres wide. It has sprawling bramble patches, suckering blackthorn and has one semi-mature ash. The single old oak near the northern end has had the ivy cut off it. There are some gaps and short lengths where the hedge is damaged. The hedge casts dense shade with little in the way of ground flora except locally abundant ivy.

Hedge 14 lies between Compartments **K** and **N** at Mackworth Park. It consists of blackthorn and hawthorn with some willow. There is a dense band of suckering blackthorn some 5 to 6 metres wide alongside the original hedge line on the Compartment **N** side.

Hedge 15 is thought to be of some antiquity as it appears on the Ordnance Survey First Edition maps of 1882. It is dominated by blackthorn, which is

dense and colonising from the line of the hedge into the grassland. It also has some hawthorn and elder. The margins have tall grasses and tall herbs including false oat-grass, cock's-foot, hogweed, broad-leaved dock and cow parsley. Some management has been done here to define the line of hedgerow by removing some of the blackthorn.

Habitat Objectives:

The objective is to manage the fantastic old hedgerow resource on site to provide as far as possible shelter, nest sites, flowers and fruit. Just one or two of the hedges could be traditionally laid and trimmed in a long rotation to prolong their life and add diversity of structure, but most are valuable when left to form tall dense hedges with trees. This habitat is important to species like song thrush and bullfinch. Blackthorn colonising from the hedges is an important species for all kinds of wildlife and an early source of nectar, and just needs keeping in check so it does not overwhelm paths or grassland. Buffer strips of bramble, tall tussocky grassland and tall herb alongside complement the hedges by providing additional foraging habitat. Management such as traditional laying or coppicing can restore a good thick structure at the base of a hedge, so is most appropriate for those hedges lacking such structure, or those that are becoming gappy. Resources are best focused on hedge-side grassland management and prevention of colonising blackthorn etc, but hedges 5 and part of 10 may be suitable for laying by volunteer groups with appropriate training. (A section of **Hedge 10** is proposed for laying to improve visibility as part of the creation of a new access route.)

The ideal time for hedgerow management is towards the end of winter, preferably as late as February. All hedge, ditch and field margin management should be avoided between March and August to prevent disturbance to nesting birds. There is a barn owl box in a mature tree in a **Hedge 3** at Compartment F at Mickleover Meadows, but to have two boxes would be even better, and there is value in having two boxes available within a few hundred metres of each other. Both boxes may be used for additional shelter by individuals from a pair, rather than a second pair of birds. Also if a second clutch of eggs is laid the barn owls often seem to prefer a different nest site to the first.

All mature hedgerow trees and the ivy on them make an excellent resource and should be kept.

Hedges 11 and **15** are known to be of some historic interest due to their great age, so it is important to retain them as landscape features.

Prescriptions:

- Manage most of the hedgerows by non-intervention, ie allow them to continue to grow un-trimmed. The buffer strips alongside should be managed as discussed in the tall grassland section.
- Retain all hedgerow trees and the ivy on them. Unless there is a safety issue, leave any fallen limbs to rot down. **Hedge 13** at Mackworth Park Compartment **N** has already had the ivy cut. It should be left to grow back and not removed again.
- Alongside **Hedges 2** and **14** the blackthorn is growing rapidly and needs flailing every year, i.e. taking back to the older growth.

- **Hedges 5 and 10** could be laid using hand tools and traditional methods. Hedge 5 has a poor structure that would benefit from management, and **Hedge 10** may have to have some hedge laying to provide better visibility for a new path, and the work could be continued along the rest of the hedge.
- Any hedge gaps should be planted with suitable site-native shrub species to reinforce the hedge. These could include field maple, hawthorn, hazel, guelder rose and holly. All existing bramble should be retained.
- **Hedges 6 and 7** may become boundaries against a new housing development and the open space associated with it, and will need to be left as tall and impenetrable a boundary as possible, and may in future need fencing on the housing side.
- Add another barn owl box near to - and within 100 metres of if possible - the barn owl box in a mature oak in **Hedge 3** at Compartment **F**, Mickleover Meadows.
- Maintain and check the bat boxes in **Hedge 3** annually. This should be done by a bat-licenced ecologist.

3.1.2 **Objective: Capital Projects for Habitat Creation**

Pond It would be useful to create a new pond that is specifically for wildlife, that is undisturbed and is capable of holding water through the amphibian breeding season. This should be made as large as possible. An area of rough grassland such as within Compartment **Ki** where there is no run-off from streams, ditches or roads is an ideal place. Because of the aim to keep the new pond disturbance-free, it should be sited away from surfaced paths, and once made, should be fenced round.

Choose a position in full sun, and shape the pond to have shallow margins to provide suitable habitat for the widest variety of marginal and aquatic plant life. Wide (about 50-60cm wide) and shallow margins (about 5-15cm deep), with a shelved profile into a central deeper well area of about 1.5m will provide the most benefit for wildlife.

A mini-digger could be used for the excavation work. All spoil could be used to form the banks. Simply 'puddling' the existing clay might be enough to make a new pond watertight, if not, a Bentonite liner should be used, but this would add hugely to the costs.

Even a small pond may be defined as an engineering operation which could require planning permission. The degree of public access should be considered when planning any new pond. Ponds constantly disturbed by dogs have been shown to have a significantly lower wildlife value than those which are undisturbed, largely due to high turbidity of the water. This problem is greater on clay soils as they are at Mickleover Meadows and Mackworth Park

To prevent disturbance the new pond should be fenced entirely. The fencing needs to be of sufficient standard to ensure it is completely dog-proof. Standard agricultural stock netting is not sufficient. It should be chain link or metal palisade. Signage may be needed to explain why these measures have been taken.

Do not add fish or wildfowl to the new pond. Emergent sedges and grasses are good for pond invertebrates and submerged plants are essential to keep the pond oxygenated. The best way to vegetate a pond is simply to leave it to colonise naturally. Also, stocking a pond increases the chances of bringing non-native plants in. Surface invertebrates like pond skaters, whirligig beetles and water boatmen will usually find a pond within a few weeks. Marginal and aquatic plants can appear within a few months. To speed up the process, however, plants can be added and the following native plants all have a value to wildlife and some could be sourced locally:

Submerged oxygenators:

spiked water-milfoil (*Myriophyllum spicatum*),
water starwort (*Callitriche stagnalis*)

Floating-leaved: Plants with leaves that float on the surface, provide valuable shade to the water and reduce the growth of algae.

water crowfoot (*Ranunculus aquatilis*),
broad-leaved pondweed (*Potamogeton natans*)

Emergent:

arrowhead (*Sagittaria aquatilis*)
water crowfoot (*Ranunculus aquatilis*)
water mint (*Mentha aquatica*)
water plantain (*Alisma plantago-aquatica*)

Marginals:

water forget-me-not (*Myosotis scorpioides*)
marsh marigold (*Caltha palustris*)
purple loosestrife (*Lythrum salicaria*),
meadowsweet (*Filipendula ulmaria*)
brooklime (*Veronica beccabunga*)
ragged-robin (*Lychnis flos-cuculi*)

It is not recommended that reedmace or common reed are added as these can become very invasive at the expense of other plants, as is occurring in other ponds on site.

Maintain the pond by keeping the surrounds free of scrub and monitoring the pond annually to inform future management. If aquatic vegetation smothers the pond so as to cover more than half the water surface, some clearing will be needed. All plant debris should be left on the sides to rot down and to allow pond invertebrates to find their way back in. Monitoring should be as per existing ponds.

Butterfly Bank

The success of the butterfly bank created at Mickleover Meadows could be repeated at Mackworth Park by the construction of a second bank. The aim is to create and maintain an area of plentiful nectar herbs but as a sparse vegetation habitat with plenty of bare ground. It is important to choose a

suitable location where there is an open un-shaded aspect. The best shape is a 'C' shape so that a variety of aspects are created, but adding any east-west line of nutrient-poor substrate such as limestone aggregate should also be effective. About 100 tons may be needed.

Species of butterflies that can benefit include the common blue, dingy skipper, small copper, six spot burnet moth and brown argus. The new bank will soon collect organic matter. It should be enhanced with pot-grown plants or plug plants of local provenance. Species should include: bird's-foot trefoil (*Lotus corniculatus*), dove's-foot crane's-bill (*Geranium molle*), common sorrel (*Rumex acetosa*), sheep's sorrel (*Rumex acetosella*), rockrose (*Helianthemum nummularium*), kidney vetch (*Anthyllis vulneraria*), wild marjoram (*Origanum vulgare*), red clover (*Trifolium pratense*), common knapweed (*Centaurea nigra*) and lady's bedstraw (*Galium verum*).

Other butterflies such as the meadow brown, wall, peacock, small tortoiseshell, comma and red admiral rely on grasses or nettles found in abundance locally.

Maintenance:

Weeding - vegetation will rapidly colonise and the bare ground will be lost. To retain at least some, and around half is ideal, it should be weeded every year. This will be a fairly labour-intensive task as it should be hand-weeded and no herbicides should be used.

Signage - the new limestone butterfly mound will look unusual and as it will be in an area open to the public, interpretation boards describing why it has been created could be positioned appropriately. This might also be a good place to advertise for volunteers to help with the maintenance and monitoring.

Monitoring - Transect monitoring should be carried out. This method of monitoring is already used for the existing butterfly bank and consists of a fixed-route walk (transect) along which butterflies are recorded on a regular basis for a number of years. Recording is done on a fixed width band ideally each week from the beginning of April until early September, between 10.45 a.m. and 3.45 p.m. when the weather is suitable. To standardise counts, recording is not done when the temperature is below 13 degrees centigrade or the wind is stronger than 5 on the Beaufort scale.

3.1.3 Objective: To carry out capital projects to provide access for all.

It is proposed to create a wheelchair-friendly route through Mackworth Park (see Plan 3 Proposed new multi-user routes) and also to improve facilities for wheelchair users at Mickleover Meadows and Mackworth Park, for instance by providing suitable benches and an accessible picnic area. In order to meet the planning application requirements for sites with ecological interest, a survey will be needed before any construction begins, in order to provide an assessment of potential impacts of any proposed new surfaced route. A report would then make an assessment of ecological value, the potential impacts and any proposed mitigations. It is not proposed to go into path or other construction details at this stage. Some safety and access work however may be needed whether or not a new multi-user route is created - between Compartments J and L some fallen and caught crack willows need felling as they are blocking the current informal path.

3.1.4 Objective: To encourage responsible use of the site.

The Friends of Mickleover Meadows are an active and knowledgeable group and are key in promoting an understanding of the site's wildlife value. The Friends group has a regularly updated website for the reserve, which helps to raise awareness and increase public interest and involvement. It is recommended that this is extended to creating a species register to which anyone can add their wildlife sightings.

The group's programme of practical conservation tasks and other activities should be continued. While encouraging public access onto the site the following should be addressed: access should be maintained: all paths and desire lines need to be managed. Passive measures such as thick hedges and fences can be used to discourage access to vulnerable areas such as the ponds. Display boards at access points may be useful in explaining management and wildlife interest and help get the message across. A sign near the new pond should explain why it is necessary to keep one pond undisturbed and not accessible to the public. Temporary signs explaining works such as scrub clearance at Mackworth Park, or a new butterfly bank creation may be helpful. Damage, whether it be accidental or caused by vandalism should be mended or replaced as soon as possible to demonstrate the caring attitude of the site managers and the majority of users of the site. Regular rubbish collection and appropriate positioning of bins, including dog waste bins, is important to maintain the area for public use.

Regular safety checks will be needed of trees, streams, access infrastructure, fences and paths with appropriate repair work carried out if necessary.

3.1.5 Objective: To carry out data collection, survey and monitoring

There is a large amount of anecdotal evidence and some confirmed data about species of flora and fauna at Mickleover Meadows and to a lesser degree at Mackworth Park, but currently no central database on which to record this. There could be centrally kept registers of wildflowers, fungi, birds, mammals and invertebrates on the website to which anyone can add their observations, but which is curated by one person. Butterflies have been studied, counted and the butterfly bank at Mickleover Meadows carefully managed since its creation in 2016. This important information should be added to the database so comparisons can be made in future years. There are many gaps in the recent status of species of fauna on both sites, such as badgers, hedgehogs, bats and many groups of insects. Birds are currently recorded, but not whether they are summer or winter visitors, resident, breeding or just flying over. More detailed survey and recording would be useful in informing the future management and increase the overall knowledge of species on site.

PSYM surveys of existing and any new ponds should be carried out in order to provide updated information to enable monitoring of the effectiveness of any management work and review as necessary. This is a standard method that provides an assessment of the ecological quality of a site compared to ponds nationally. It requires basic environmental information including identification of the plant species and invertebrate groups found at the site.

All amphibian records should be passed to the County Amphibian Recorder. The Friends group should continue to monitor and give feedback to Derby City Pond Wardens' Association.

It is also important to carry out regular monitoring of species and habitat condition to inform ongoing management: Any new habitats such as the wildlife pond and butterfly bank should be monitored to determine their use and to assess them for future management.

3.2 Natural and man-induced trends

Natural trends:

Nothing remains the same in nature, and if left completely unmanaged the tall grassland/tall ruderal areas of Compartments **J**, **K**, **L** and **N** would be lost by natural succession as the colonisation by hawthorn, oak, blackthorn and ash already begun, would continue fairly rapidly. This would result in large areas of dense and dominant scrub, shading out all the grassland species. The scrubbing up would continue and taller trees would grow through the shorter ones to eventually develop a long term succession to broad-leaved woodland. Ash dieback is considered here as a natural trend. It is caused by a fungus spread by the wind, causing leaf loss, crown dieback and bark lesions in affected trees, and once a tree is infected the disease is usually fatal. Ash however has strong genetic diversity which may allow it to evolve resistance. The full impact of Ash dieback is not yet known in the country as a whole or on the site. It kills young trees quickly, whereas older trees can resist for some time. This may have the effect of reducing the density of the areas of self-set ash saplings in Compartments **J**, **K** and **L**.

The hedges would continue to spread outwards by rapidly colonising species such as blackthorn and bramble forming large clumps.

The small woodland areas are likely to be fairly stable and change least, simply regenerating naturally wherever a gap is created by a fallen tree, etc.

The butterfly bank would become grassed over and the less competitive species and all the bare ground would be lost.

The ponds would rapidly silt up and eventually dry out altogether accelerated by leaf fall and wetland plants and saplings growing unchecked.

Watercourses would remain choked up by debris, which would tend to accumulate and cause more permanent blockages.

Paths would become overgrown by bramble and scrub and blocked by fallen branches.

Man-induced trends:

There are many threats to the wildlife of the country as a whole, some are relevant to the site and are caused initially by human activity. These include:

Climate change

Introduction of non-native species

Falling ground water levels

Problems caused by dogs

Traffic noise

One of the most significant impacts of climate change is increased flood risk. This includes risk of flooding from watercourses but urban areas are also at risk from surface water run off. Derby may have increased summer

temperatures, reduced summer rainfall and increased winter rainfall. Mild winters are now normal. There is strong evidence that climate change is already influencing biodiversity but its effect on plant growth and animal life cannot yet be fully predicted. Many plant species are flowering earlier, and butterflies are on the wing earlier in the year. Some butterflies however, may actually benefit from warmer temperatures.

Birds may have to change their nesting and egg-laying times as a response to changing availability of food for their young. Migratory species seem particularly vulnerable and some familiar species may disappear altogether, while new ones may appear. Research has shown that breeding birds may move north by an average of 300 miles as a response to climate change. All this adds up to a huge reshuffling of birds in the UK. Swallows, whitethroats and warblers stay longer before migrating. Some shorter-distance migrators now stay all winter instead of migrating at all. Blackbirds, robins, blue tits and other common birds however, tolerate a range of temperatures, so may not be affected.

The introduction of non-native species is a minor issue on the site, but has a potential impact on ponds. Fish are predators on tadpoles and could devastate an amphibian population if added to a wildlife pond.

Falling ground water levels is a national problem partly caused by increased water consumption and if this trend continues it is likely to limit the ability of the ponds to hold water and the streams to flow, particularly during the summer months. Groundwater levels usually rise during the winter, but have been unusually low in recent years due to low winter rainfall.

Scientific research has shown that dog-walking can have a significant and detrimental effect on wildlife. It is known to cause more than 40 per cent reduction in bird abundance and more than 35 per cent reduction in bird diversity in woodlands in general, even if the dogs are kept on a lead. Inevitably the issue of dog walking in nature reserves is a controversial issue as many dog walkers are very responsible and also nature lovers who certainly don't wish to cause harm to the wildlife but unfortunately this can often be the case. Dog numbers in the UK are steadily increasing. After millions of years of being preyed on by foxes and wolves, birds are not able to become accustomed to disturbance by dogs. Most dogs, if not under close control, have an inherent tendency to seek out and chase wild animals, although they do not always kill them. The reaction of birds to dogs, such as taking flight in fear, parents flushed from eggs or young, alarm calls, etc., has a cost in energy terms and this can be significant in winter. Where dogs have a particular negative impact on wildlife on the site is in the ponds. These are vulnerable to dogs causing continual disturbance and water turbidity making them unable to support amphibians.

Another unfortunate side effect of dog-walking includes dog mess, which can be a health hazard to children, and to staff and volunteers who manage the site.

Studies have shown that road traffic noise has an effect on some bird species: reed buntings show shifts in song frequency in response to traffic noise and singing in robins, house sparrows, starlings and bullfinches seem to be affected by road traffic noise. Bats use ultrasonic frequencies and barn owls

hunt by hearing sounds too quiet for humans to detect. Traffic noise masks the sound of predators and makes it harder for birds to listen for the songs of their own kind. Some bird and bat species may not be able to thrive near to the A38 as a result. It is not known how increased traffic or the proposed A38 re-alignment works will affect the biodiversity of the part of the site affected by noise, but it is likely that it will to some degree. Other possible effects of nearby busy roads are light pollution and animal road casualties.

3.3 Management Constraints

3.3.1 Legal obligations:

The Wildlife and Countryside Act 1981 and subsequent amendments has relevant sections and must be consulted, for example there is an obligation not to disturb or damage protected species including birds in the nesting season.

Bats All bat species and their places of shelter (roosts) are legally protected and it is an offence to kill, injure or disturb a bat or destroy, damage or obstruct a bat roost. Planning authorities have a legal obligation to consider whether bats are likely to be affected by a proposed development. This will become relevant when work on any new surfaced path is considered. Bat boxes must only be checked by a licenced ecologist.

Amphibians and Reptiles There are 6 native species of reptiles and 6 native amphibians in the UK. Reptiles are not known to be on site, but can easily be missed if not specifically surveyed for. Great crested newts have the highest protection, while common lizard, grass snake, slow worm and adder are protected by law against killing, injuring and sale. The four widespread species of amphibian - smooth and palmate newts, the common frog and common toad, are protected only by Section 9(5) of the Wildlife and Countryside Act 1981. This prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy. Collection and keeping of these widespread amphibian species is not an offence.

Hedges

The Hedgerow Regulations 1997 protect important hedges from removal. A hedgerow is considered 'important' if it is at least 30 years old and marks all or part of a parish boundary that existed before 1850. Some hedges on site qualify: hedges 8 and 11 are marked as Parish boundary hedges on the 1880 OS map.

Although the Wildlife and Countryside Act does not legally state a time of year restricting hedgerow management, all hedge work should be done outside the main bird nesting season (which in England is recognised as being 1 March to 31 July). All wild birds are protected however and this includes their nests (whilst in use or being built) as well as any eggs the nest may contain. Under

the Wildlife & Countryside Act 1981 (as amended), it is an offence to: intentionally kill, injure or take any wild bird; intentionally damage, destroy or take the nest of any wild bird while it is in use or being built; intentionally destroy an egg of any wild bird; intentionally or recklessly disturb certain wild birds or their dependent young while they are nesting (including disturbance of nesting young)

Birds If anyone has evidence that an offence has been committed in relation to any wild bird (see above) they should contact the local Police and report the incident to them. They should ask for the case to be investigated by a Wildlife Crime Officer and ask for an incident number, and/or contact the RSPB Investigations Section.

Barn Owls have extra legal protection as they are a protected species included in Schedule 1 of the Wildlife & Countryside Act 1981. The penalty for an offence involving a Barn Owl, its nest or egg, includes a fine, or up to six months imprisonment, or both, per bird, nest or egg. It is also illegal to release barn owls into the wild without a licence.

Ash dieback The fungus which causes Chalara dieback of ash is treated as a quarantine organism under National emergency measures, and any suspected sighting must be reported, with photographs, to the Forestry Commission via its Tree Alert reporting system, which has an on-line portal. There should be no new planting of ash trees on site - a Plant Health Order prohibits the import and movement of ash seeds, plants and trees.

Felling licences Unless trees are dead or pose a danger to the public, felling of diseased ash or any other tree will usually need a felling licence from the Forestry Commission. Derby City Council as landowners should ensure that they have long-term felling permissions in place, to allow any future outbreaks of Chalara ash dieback to be managed without delay. A single felling licence application could consider all the trees on the site, including those in the hedgerows and adjacent to public rights of way. Some trees are protected by other legislation, and it is essential that their legal status is established before carrying out any work on them. These include Tree Preservation Orders (TPO), Conservation Areas, Planning Conditions or Restrictive Covenants. None are known for the site at date of writing, but the information needs checking and updating.

Equality Act 2010

This applies to any business or organisation delivering or offering a service to, or access to, any business, public area or building. Provisions under this Act will need to be addressed as regards signs, information media, access and volunteer and other opportunities. In addition to the Equality Act there is a Public Sector Equality Duty under which the Council falls. Both these Acts state that additional or special considerations might have to be made for disabled people if equitable delivery of service or access is to be achieved.

Planning Permission This will be needed for operations considered as engineering works such as excavating a new pond or constructing a surfaced

multi-user path. All conditions of any planning permission, such as tree removal or brook revetments must be carried out by suitably qualified contractors.

There is currently (January 2019) a planning application submitted for a proposed multi-user surfaced path towards the eastern edge of Mackworth Park. For the new multi-user path proposed in this Management Plan, in order to meet the planning application requirements for sites with ecological interest, a survey would be needed before any construction begins. This would provide an assessment of potential impacts of any proposed new route. A report would then present the findings of the survey and make an assessment of ecological value, the potential impacts and any mitigation measures needed.

Health and Safety Most of the legislation regarding health and safety is aimed at the workplace and volunteers are not covered. It is, however, good practice to comply and consider safety in training, using equipment, tools and first aid equipment. The Management of Health and Safety at Work Regulations 1992 introduced the need for a risk assessment. Groups should therefore always undertake a risk assessment, be given appropriate training and clear safety instructions and have a first-aid certificate holder present.

There are Health and Safety considerations when working near water - Several diseases including Weil's disease must be considered in any work near water, as the bacteria which cause it can be present wherever rodents are found, specially near or in water. Weil's disease can be dangerous and in extreme cases can result in serious illness or death. The infection is contracted mainly through open cuts and abrasion in the skin. Make sure all cuts are covered beforehand with a waterproof plaster or waterproof clothing. If blue-green algae or visible pollution is present, postpone the task. Tetanus vaccinations must be up to date. There should be no lone working in or near water.

The Control of Substances Hazardous to Health (COSHH) Regulations require that pesticides (including herbicides) should only be used where necessary and where the benefits significantly outweigh the risks to human health and the environment. Non-chemical control options must be considered and herbicides should only be used in situations where alternatives do not exist, or are impractical or likely to be inadequate.

Risk assessment and COSHH forms should be completed before herbicide is used to treat cut stumps. All requirements of herbicide use must be complied with - application method, timing, rate, disposal of excess chemicals, protective clothing etc.

3.3.2 Consultations: The Environment Agency should be consulted on all works affecting a watercourse or within 50m of one. Consent may be needed from the Environment Agency before any work on a new pond can take place, so it is advisable that they are contacted early on in the process.

Derby City Council as landowners are responsible for the stretch of any watercourses on the land, i.e. Bramble Brook. This includes notifying The Environment Agency of any blockages, collapsed or damaged banks, pollution incidents or flooding, as these could affect larger watercourses downstream. The water must be allowed to flow naturally and litter should be removed from

the banks. The water must not be polluted and you should apply to use any herbicides within 1 metre of the top of the banks.

3.3.3 Cost:

The cost of putting in a new tarmac or asphalt-surfaced multi-user path is likely to be considerable. The cost can only be estimated until details of the path are decided on, but it is likely to be thousands of pounds per kilometre of path. Path maintenance and repair must also be considered. The cost of crushed limestone to construct a new butterfly bank may be substantial. Other significant costs for the pond construction are for operator and machine, any liner, maintenance and repair and erecting the secure metal fencing.

3.3.4 Disturbance: Continuous disturbance by the public with dogs off the lead is a constraint in considering some management issues. This applies particularly to shy and to ground-nesting species of birds as well as the usefulness of the existing ponds and any new pond and its surrounding terrestrial habitat as an amphibian refuge.

3.3.5 Practical constraints:

Mackworth Park contains a large area of virtually un-managed scrub, grassland and woodland. It will need funding before it can be taken into conservation management. Work such as scrub clearance and hedge laying is very labour intensive and time specific. It may prove difficult to get the labour just when needed. Some of the work however, may be suitable for community groups and volunteers. Some of the land is not accessible to tractors and machinery and some infrastructure - paths, bridges etc may be needed to allow access to machinery to undertake the larger jobs.

3.4 Management and Funding Opportunities.

The future of Mickleover Meadows and Mackworth Park depends on long term commitment and funding, so it is hoped that the Management Plan can be renewed after their expiry date. Some of the projects proposed are unlikely to go ahead without additional funding. Sources of funds are particularly uncertain in these changing times, but may include: local authority transport budgets, the Heritage Lottery Fund, Section 106 or 'developer contributions' for the A38 improvement work and Community Action funds.

Mickleover Meadows and Mackworth Park 10-YEAR WORK PROGRAMME. Years 1 to 5

Habitat	Management Prescription	Priority		Year 1	Year 2	Year 3	Year 4	Year 5
		Essential	Desirable					
Haymeadow grassland (Ai, B, Di and Eii)	Mow once a year in late August or September.	●		✓	✓	✓	✓	✓
	Leave the cut grass to dry and turn once		●	✓	✓	✓	✓	✓
	Collect cuttings and remove from site	●		✓	✓	✓		✓
	Leave at least 2 metres un-mown against hedges and woodland areas	●		✓	✓	✓	✓	✓
	Using hand tools or a tractor-mounted flail, cut the scrub and brambles from these margins once every 3 years in the autumn or winter.	●		✓			✓	
	Mow informal paths and desire lines through meadows for a width of at least 1 metre fortnightly during the growing season.		●	✓	✓	✓	✓	✓
	Mow 1 to 2 metres alongside all surfaced paths fortnightly during the growing season.		●	✓	✓	✓	✓	✓
	Plant wildflower plugs in order to enrich the sward in species-poor areas such as Compartments Ai, Di and Eii.		●	✓				
	By hand scarifying/raking or a pedestrian scarifier, create small bare areas within the meadows where desired.		●	✓				✓
	Seed scarified areas with ox-eye daisy. Repeat as necessary every few years.		●	✓				✓
	Monitor meadows by full survey	●		✓	✓	✓	✓	✓
	Maintain the records on a central database for a year on year comparison	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Tall grassland (Compartments C, F, J, K, L and N plus the grassy margins to all hedgerows)	Apart from the areas chosen to develop into woodland, remove the individual saplings, bramble patches and hawthorn shrubs from J, K, L and N to leave none in N, 5% scrub overall in J and K and 25% in L. Treat cut stumps with an approved herbicide. Remove brashing from site.	●		✓	✓	✓	✓	✓
	Use a scrub-cutter around the bramble patches every year to prevent an increase.	●		✓	✓	✓	✓	✓
	Create tall grassland margins to all hedges and controlling the encroaching scrub one year in three by hand or tractor-mounted flail mower. Remove cuttings from site. Where paths are currently mown at the hedge bottom, re-create them further in to the field.	●		✓	✓	✓	✓	✓
	Establish a tall grass base around all woods and copses by leaving 2 to 3 metres un-mown and controlling the encroaching scrub one year in three by hand or tractor-mounted flail mower. Brashing can be chipped or stacked in piles on site to rot down.	●		✓			✓	
	Avoid managing all the above grassland margins in the same year. Mow in autumn on a rotation so there are always some un-mown.	●		✓			✓	

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Tall grassland (Compartments C, F, J, K, L and N plus the grassy margins to all hedgerows) contd.	Plant pot-grown plants suitable for the conditions (see tall grassland prescriptions in text for details) into tall grassland areas, plus margins to woodlands, copses and hedges. Can be repeated as advised by monitoring.		●		✓			
	Mow all the informal grassy paths regularly in summer and remove the cuttings. Perimeter paths should be several metres away from the hedges and 2 to 3 metres wide.	●		✓	✓	✓	✓	✓
	Continue to mow no more than 1 to 2 metre width strip at the sides of the tarmac path, and do the same for any new multi-user access routes.		●	✓	✓	✓	✓	✓
	Continue to remove litter regularly		●	✓	✓	✓	✓	✓
	Monitor tall grassland annually by carrying out a full species survey	●		✓	✓	✓	✓	✓
	Maintain the records on a central database for a year on year comparison.	●		✓	✓	✓	✓	✓
	J and K: Remove individual saplings, bramble patches and shrubs, leaving around 5% cover not including Ji, Kii and Kiii. Spot-treat cut stumps with herbicide. Use a scrub-cutter around the bramble patches every year to prevent an increase.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Tall grassland (Compartments C, F, J, K, L and N plus the grassy margins to all hedgerows)contd.	L: Remove individual oak, ash, willow, bramble patches and hawthorn shrubs, to leave around 25% cover, not including Li and Liii, the dense scrub areas chosen to succeed to woodland. The power lines mark the approximate position of the edge of the scrub areas to be left as woodland.	●		✓	✓	✓	✓	✓
	In the 3 above compartments, up to 6 individual young trees per compartment can be chosen and left to mature.		●	✓				
	Brashing can be chipped or stacked in piles on site to rot down. Any bramble growing through the brashing piles can be left.	●		✓	✓	✓	✓	✓
Improved amenity grassland	Leave a wide an un-mown perimeter around the edges of the close-mown fields against the hedges and around the copses.		●	✓	✓	✓	✓	✓
Butterfly bank	Hand cut or pull tall species several times per summer. Remove tussocks of grass to provide open ground. Remove cut material from site. Aim for around 50% bare ground.	●		✓	✓	✓	✓	✓
	Once every autumn remove the dead thatch of plant material that may affect the next year's growth. Remove cut material from site.	●		✓	✓	✓	✓	✓

	Leave an area of grass un-mown to the north of the bank and manage by a single autumn cut. Remove cut material. Allow all herb growth of dock, nettle and thistle in this area.		●	✓	✓	✓	✓	✓
	Add common sorrel to the bank or grass margin.		●	✓	✓	✓	✓	✓
	Monitor butterfly species and numbers every year, ideally by transect across the mound and surrounding area, to gather data on invertebrates and vegetation changes.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Scrub	Do not remove any shrubs or saplings within areas Ji, Kii, Kiii, Li or Liii .	●		✓	✓	✓	✓	✓
	Carry out annual monitoring by full plant surveys with frequencies to assess change and inform future management.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Woodland	Retain all canopy trees, including all the ivy on them, all fallen timber and standing dead wood, unless there is a safety issue or branches block paths.	●		✓	✓	✓	✓	✓
	Litter should be collected regularly from all woodland areas.		●	✓	✓	✓	✓	✓
	Carry out safety checks and work such as coppicing or bough removal on all trees near to and overhanging the surfaced path, specifically the multi-stem ash near wood Jiii and the crack willows on the path between Compartments J and L. Stack any cut timber into piles as habitat stacks.	●		✓	✓	✓	✓	✓
	Remove non-native bluebells and plant native bluebell bulbs in any woodland to enhance the ground flora. Plant as many as funding allows, at irregular spacings and well spread out and leave to naturalise. Plant in autumn at twice the depth of the bulb.		●	✓	✓	✓	✓	✓
	Enhance woodland edge structure and extend woodland area wherever possible by planting site-native shrubs at the edges.		●	✓	✓	✓	✓	✓
	Erect nest boxes where they are sheltered and most likely to succeed, depending on the target species. Kestrel boxes are recommended, but do not erect tawny owl boxes.		●	✓				
	Erect bat boxes as high as possible on large limbs of suitable trees.		●	✓				

	Maintain nest boxes by clearing them of debris every year in winter, preferably no later than early January, and if necessary protect from woodpecker and squirrel damage by reinforcing the entrance hole with a metal strip		●	✓	✓	✓	✓	✓
	Maintain all current and any new bat boxes - this will need to be done by a qualified and licensed bat worker.		●	✓	✓	✓	✓	✓
	Monitor the spread of ash dieback over the whole site to inform future management needs.	●		✓	✓	✓	✓	✓
	Monitor all woodlands to assess for future management and safety work.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Ponds	Pond 1 The School Pond - clear out all debris, rubbish and litter from the pond and keep the banks free of scrub and saplings.	●		✓	✓	✓	✓	✓
	Deepen to 75 cm and extend Pond 1. Line with Bentonite liner if necessary.		●	✓				
	Pond 2 The Bridge Pond - If funds allow, this pond could be enlarged and then allowed to fill with common reed to act as a reed bed filter to water flowing downstream.		●	✓				
	Remove all encroaching willow scrub from Pond 2 surrounds annually.	●		✓	✓	✓	✓	✓
	Pond 3 Millennium Pond - renew the fencing around the pond.		●	✓				
	Control the reedmace in Pond 3. It will probably grow back from tubers and be an ongoing annual task.		●	✓	✓	✓	✓	✓
	Clear out all debris, rubbish and litter from Pond 3.	●		✓	✓	✓	✓	✓
	Once every 2 to 3 years, using hand tools, cut the surrounding grassland to Pond 3 control scrub and bramble. Work in autumn/winter. Remove cuttings.	●		✓			✓	
	Maintain at least half the pond area of open water by vegetation removal. Leave on banks to rot down for 24 hours then remove.	●		✓	✓	✓	✓	✓

	Pond 4 - Maintain extent of reedmace ('bulrush') at current level. Remove the reedmace where it is colonising into the pond, when advised by monitoring to be necessary. Work should be carried out between 31 October and 1 February.	●		✓	✓	✓	✓	✓
	Remove colonising willow saplings from the pond banks amongst the reedmace and from within the pond itself. Work in winter (November - February)	●		✓	✓	✓	✓	✓
	Remove all rubbish regularly, avoiding disturbance during the amphibian breeding season i.e. February to July. There should be no mowing around the pond or in the tall grassland, and no further tree planting near the pond.	●		✓	✓	✓	✓	✓
	All Ponds - Carry out PSYM (P redictive S ystem for M ultimetrics) surveys during June, July or August.	●		✓		✓		✓
	All ponds - report any amphibian records to the County Recorder.	●		✓	✓	✓	✓	✓
Streams and ditches	Collect and remove from site all the litter, rubbish, scrap and non-organic material from the main waterways on the site. This is likely to be an required task in several times a year in order to keep the flow of water.	●		✓	✓	✓	✓	✓
	Unblock or rebuild the culvert beneath the bridge between Compartments J and L.	●		✓				

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Hedgerows	Retain all hedgerow trees and the ivy on them. Unless there is a safety issue, leave any fallen limbs to rot down	●		✓	✓	✓	✓	✓
	Alongside Hedges 2 and 14 the blackthorn is growing rapidly and needs flailing every year, i.e. taking back to the older growth.	●		✓	✓	✓	✓	✓
	Hedges 5 and 10 could be laid using hand tools and traditional methods.		●			✓		
	Plant any hedge gaps with suitable site-native shrub species. These could include field maple, hawthorn, hazel, guelder rose and holly. All existing bramble should be retained.		●	✓		✓		✓
	Hedges 6 and 7 - leave as tall and impenetrable a boundary as possible. They may in future need fencing on the new housing side.		●				✓	
	Add another barn owl box within 100 metres if possible of the barn owl box in a mature tree in Hedge 3.		●	✓				
	Maintain and check the bat boxes in all hedges annually. This should be done by a bat-licenced ecologist.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
Creation of a new pond	In an open area of Field K, create a new pond that is specifically for wildlife (see text for details of construction.)		●	✓				
	Erect secure fence around the pond with access gate for maintenance.	●		✓				
	Monitor as for existing ponds.	●		✓	✓	✓	✓	✓
	Maintain the pond by keeping the surrounds free of scrub. If aquatic vegetation smothers the pond so as to cover more than half the water surface, some clearing will be needed.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority Essential		Year 1	Year 2	Year 3	Year 4	Year 5
New butterfly bank	Create new butterfly bank in Compartment K or L, see text for details of construction.		●	✓				
	Plant pot-grown plants or plug plants of local provenance.		●	✓				
	Monitor butterfly species and numbers every year, ideally by transect across the mound and surrounding area, to gather data on invertebrates and vegetation changes.	●		✓	✓	✓	✓	✓
	Hand cut or pull tall species several times per summer. Remove tussocks of grass to provide open ground. Remove cut material from site. Aim for around 50% bare ground.	●		✓	✓	✓	✓	✓
	Carry out transect monitoring as per original butterfly bank	●		✓	✓	✓	✓	✓
Whole Site	Check trees, check and maintain paths and access infrastructure, repair any damage. Collect litter.	●		✓	✓	✓	✓	✓
	Monitor species and habitat condition	●		✓	✓	✓	✓	✓
	Survey for under-recorded species		●	✓	✓	✓	✓	✓
	Continue programme of informal public events and conservation activities		●	✓	✓	✓	✓	✓
	Set up, maintain and add records to a Mickleover Meadows and Mackworth Park Friends website.		●	✓	✓	✓	✓	✓

Mickleover Meadows and Mackworth Park 10-YEAR WORK PROGRAMME. Years 6 to 10

Compartment	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
		Essential	Desirable					
Haymeadow grassland (Ai, B, Di and Eii)	Mow once a year in late August or September.	●		✓	✓	✓	✓	✓
	Leave the cut grass to dry and turn once		●	✓	✓	✓	✓	✓
	Collect cuttings and remove from site	●		✓	✓	✓		✓
	Leave at least 2 metres un-mown against hedges and woodland areas	●		✓	✓	✓	✓	✓
	Using hand tools or a tractor-mounted flail, cut the scrub and brambles from these margins once every 3 years in the autumn or winter.	●			✓			✓
	Mow informal paths and desire lines through meadows for a width of at least 1 metre fortnightly during the growing season.		●	✓	✓	✓	✓	✓
	Mow 1 to 2 metres alongside all surfaced paths fortnightly during the growing season.		●	✓	✓	✓	✓	✓
	Plant wildflower plugs in order to enrich the sward in species-poor areas such as Compartments Ai, Di and Eii.		●	✓				
	By hand scarifying/raking or a pedestrian scarifier, create small bare areas within the meadows where desired.		●				✓	
	Seed scarified areas with ox-eye daisy. Repeat as necessary every few years.		●				✓	
	Monitor meadows by full survey	●		✓	✓	✓	✓	✓
	Maintain the records on a central database for a year on year comparison	●		✓	✓	✓	✓	✓

Compartment	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
Tall grassland (Compartments C, F, J, K, L, M and N plus the grassy margins to all hedgerows)	Apart from the areas chosen to develop into woodland, remove the individual saplings, bramble patches and hawthorn shrubs from J, K, L and N to leave none in N, 5% scrub overall in J and K and 25% in L. Treat cut stumps with an approved herbicide. Remove brashing from site.	●		✓	✓	✓	✓	✓
	Use a scrub-cutter around the bramble patches every year to prevent an increase.	●		✓	✓	✓	✓	✓
	Create tall grassland margins to all hedges and controlling the encroaching scrub one year in three by hand or tractor-mounted flail mower. Remove cuttings from site. Where paths are currently mown at the hedge bottom, re-create them further in to the field.	●		✓	✓	✓	✓	✓
	Control the scrub in tall grass around woods and copses one year in three by hand or tractor-mounted flail mower. Brashing can be chipped or stacked in piles on site to rot down.	●			✓			✓
	Avoid managing all the above grassland margins in the same year. Mow in autumn on a rotation so there are always some un-mown.	●			✓			✓

Habitat	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
Tall grassland (Compartments C, F, J, K, L, M and N plus the grassy margins to all hedgerows) contd.	Plant pot-grown plants suitable for the conditions (see tall grassland prescriptions in text for details) into tall grassland areas, plus margins to woodlands, copses and hedges. Can be repeated as advised by monitoring.		●	✓				
	Mow all the informal grassy paths regularly in summer and remove the cuttings. Perimeter paths should be several metres away from the hedges and 2 to 3 metres wide.	●		✓	✓	✓	✓	✓
	Continue to mow no more than 1 to 2 metre width strip at the sides of the tarmac path, and do the same for any new multi-user access routes.		●	✓	✓	✓	✓	✓
	Continue to remove litter regularly		●	✓	✓	✓	✓	✓
	Monitor tall grassland annually by carrying out a full species survey	●		✓	✓	✓	✓	✓
	Maintain the records on a central database for a year on year comparison.	●		✓	✓	✓	✓	✓
Improved amenity grassland	Leave a wide an un-mown perimeter around the edges of the close-mown fields against the hedges and around the copses.		●	✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
Butterfly bank	Hand cut or pull tall species several times per summer. Remove tussocks of grass to provide open ground. Remove cut material from site. Aim for around 50% bare ground.	●		✓	✓	✓	✓	✓
	Once every autumn remove the dead thatch of plant material that may affect the next year's growth. Remove cut material from site.	●		✓	✓	✓	✓	✓
	Leave an area of grass un-mown to the north of the bank and manage by a single autumn cut. Remove cut material. Allow all herb growth of dock, nettle and thistle in this area.		●	✓	✓	✓	✓	✓
	Add common sorrel to the bank or grass margin.		●	✓	✓	✓	✓	✓
	Monitor butterfly species and numbers every year, ideally by transect across the mound and surrounding area, to gather data on invertebrates and vegetation changes.	●		✓	✓	✓	✓	✓
Scrub	Do not remove any shrubs or saplings within areas Ji , Ki , Kiii , Li or Liii .	●		✓	✓	✓	✓	✓
	J and K : Remove individual saplings, bramble patches and shrubs, leaving around 5% cover not including Ji , Ki and Kiii . Spot-treat cut stumps with herbicide. Use a scrub-cutter around the bramble patches every year to prevent an increase.	●		✓	✓	✓	✓	✓

	L: Remove individual oak, ash, willow, bramble patches and hawthorn shrubs, to leave around 25% cover, not including Li and Liii, the dense scrub areas chosen to succeed to woodland. The power lines mark the approximate position of the edge of the scrub areas to be left as woodland.	●		✓	✓	✓	✓	✓
	Brashing can be chipped or stacked in piles on site to rot down. Any bramble growing through the brashing piles can be left.	●		✓	✓	✓	✓	✓
	Carry out annual monitoring by full plant surveys with frequencies to assess change and inform future management.	●		✓	✓	✓	✓	✓
Woodland	Retain all canopy trees, including all the ivy on them, all fallen timber and standing dead wood, unless there is a safety issue or branches block paths.	●		✓	✓	✓	✓	✓
	Litter should be collected regularly from all areas.		●	✓	✓	✓	✓	✓

Woodland contd.	Carry out safety checks and work such as coppicing or bough removal on all trees near to and overhanging the surfaced path, specifically the multi-stem ash near wood Jiii and the crack willows on the path between Compartments J and L. Stack any cut timber into piles as habitat stacks.	●		✓	✓	✓	✓	✓
	Plant native bluebell bulbs in any woodland to enhance the ground flora. Simply plant as many as funding allows, at irregular spacings and well spread out and leave to naturalise. Plant in autumn at twice the depth of the bulb.		●	✓	✓	✓	✓	✓
	Enhance woodland edge structure and extend woodland area wherever possible by planting site-native shrubs at the edges.		●	✓	✓	✓	✓	✓
	Erect nest boxes where they are sheltered and most likely to succeed, depending on the target species. Kestrel boxes are recommended, but do not erect tawny owl boxes.		●	✓				
	Erect bat boxes as high as possible on large limbs of suitable trees.		●	✓				
	Maintain nest boxes by clearing them of debris every year in winter, preferably no later than early January, and if necessary protect from woodpecker and squirrel damage by reinforcing the entrance hole with a metal strip		●	✓	✓	✓	✓	✓
	Maintain all current and any new bat boxes - this will need to be done by a qualified and licensed bat worker.		●	✓	✓	✓	✓	✓

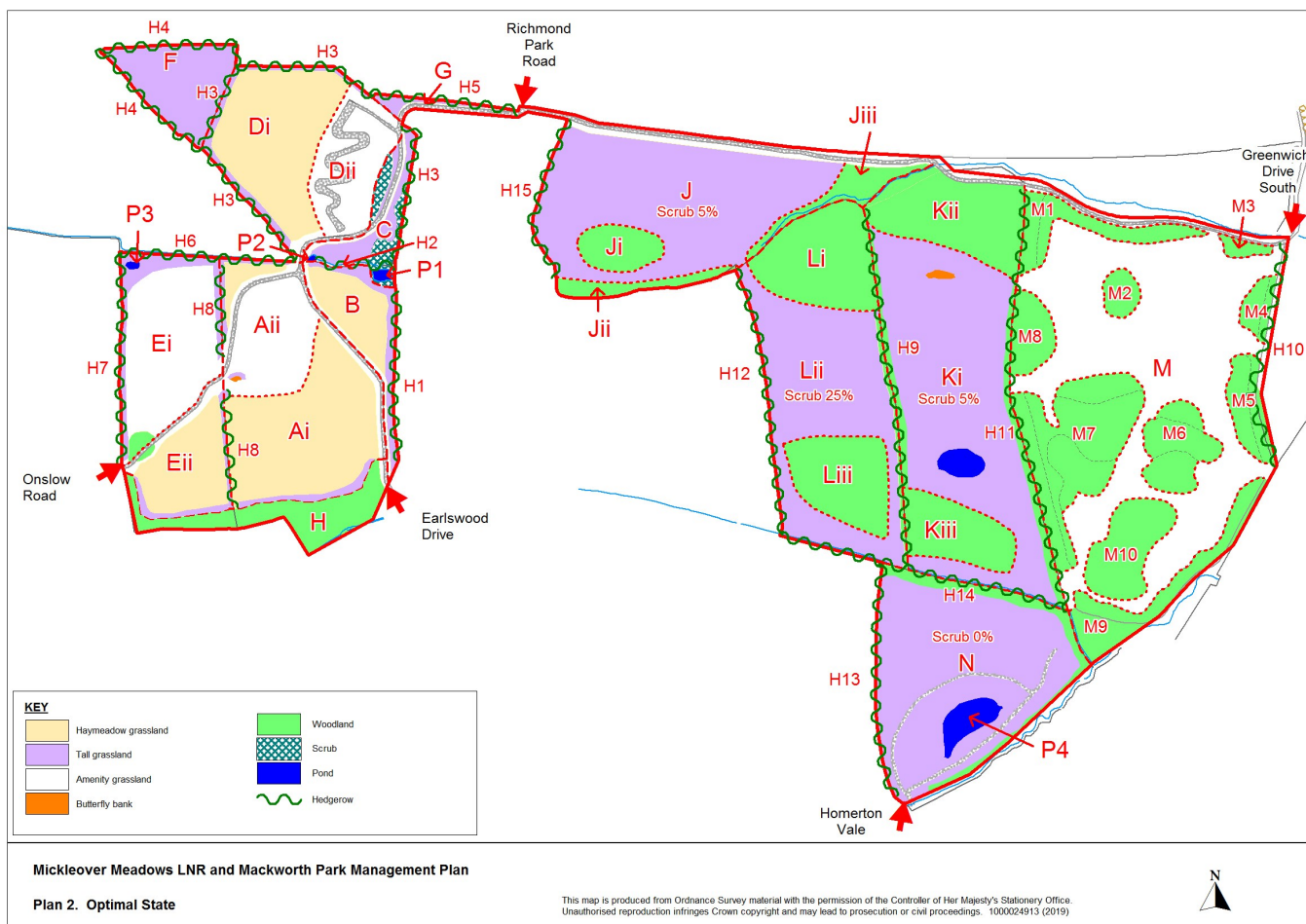
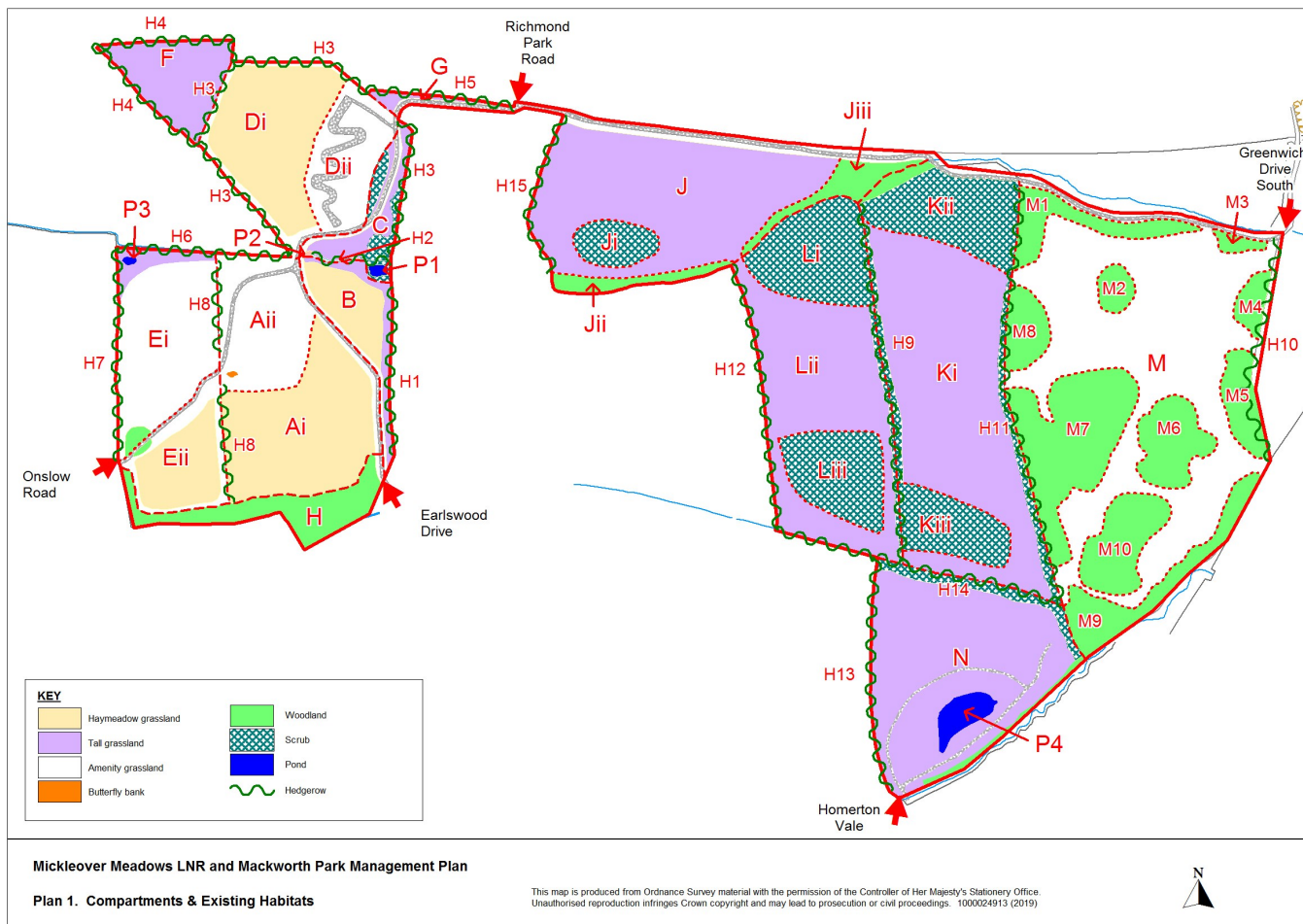
Woodland contd.	Monitor the spread of ash dieback over the whole site to inform future management needs.	●		✓	✓	✓	✓	✓
	Monitor all woodlands to assess for future management and safety work.	●		✓	✓	✓	✓	✓
Ponds	Pond 1 The School Pond - clear out all debris, rubbish and litter from the pond and keep the banks free of scrub and saplings.	●		✓	✓	✓	✓	✓
	Remove all encroaching willow scrub from Pond 2 surrounds annually.	●		✓	✓	✓	✓	✓
	Control the reedmace from Pond 3. It will probably grow back from tubers and be an ongoing annual task.		●	✓	✓	✓	✓	✓
	Clear out all debris, rubbish and litter from Pond 3.	●		✓	✓	✓	✓	✓
	Once every 2 to 3 years, using hand tools, cut the surrounding grassland to Pond 3 control scrub and bramble. Work in autumn/winter. Remove cuttings.	●			✓			✓
	Maintain at least half of area of open water by vegetation removal. Leave on banks to rot down for 24 hours then remove.	●		✓	✓	✓	✓	✓
	Pond 4 - Maintain extent of reedmace ('bulrush') at current level. Remove the reedmace where it is colonising into the pond, when advised by monitoring to be necessary. Work should be carried out between 31 October and 1 February.	●		✓	✓	✓	✓	✓
	Remove colonising willow saplings from the pond banks amongst the reedmace and from within the pond itself. Work in winter (November - February)	●		✓	✓	✓	✓	✓

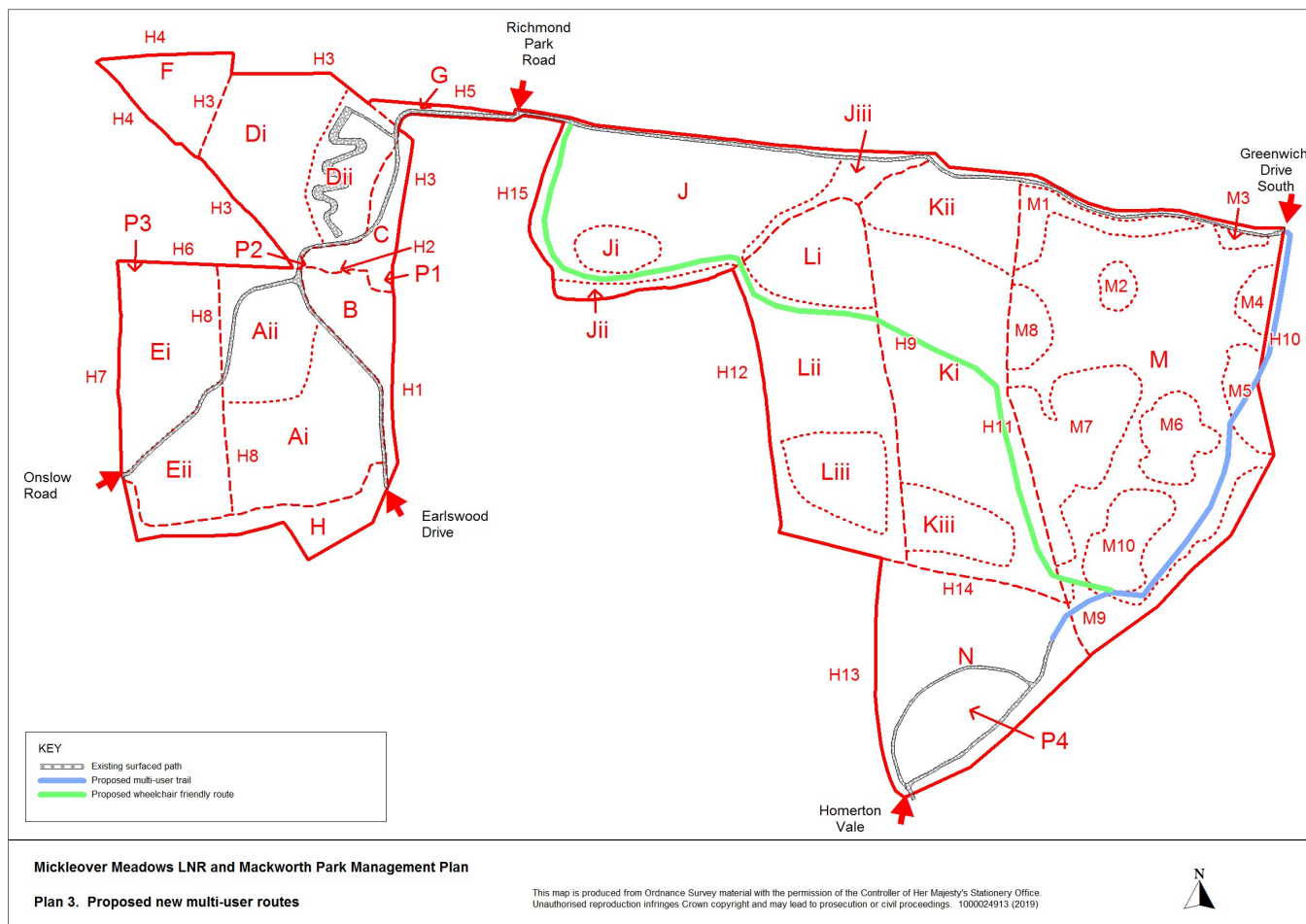
Ponds contd.	Remove all rubbish regularly, avoiding disturbance during the amphibian breeding season i.e. February to July. There should be no mowing around the pond or in the tall grassland, and no further tree planting near the pond.	●		✓	✓	✓	✓	✓
	All Ponds - Carry out PSYM (P redictive S ystem for M ultimetrics) surveys during June, July or August.	●			✓		✓	
	All ponds - report any amphibian records to the County Recorder.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
Streams and ditches	Collect and remove from site all the litter, detritus, scrap and non-organic material from the main waterways on the site. This is likely to be an required task in several times a year in order to keep the flow of water.	●		✓	✓	✓	✓	✓
Hedgerows	Retain all hedgerow trees and the ivy on them. Unless there is a safety issue, leave any fallen limbs to rot down	●		✓	✓	✓	✓	✓
	Alongside Hedges 2 and 14 the blackthorn is growing rapidly and needs flailing to take back to the older growth.	●			✓		✓	
	Plant any hedge gaps with suitable site-native shrub species. These could include field maple, hawthorn, hazel, guelder rose and holly. All existing bramble should be retained.		●	✓		✓		✓
	Maintain and check the bat boxes in all hedges annually. This should be done by a bat-licenced ecologist.	●		✓	✓	✓	✓	✓
Any new pond	Monitor as for existing ponds.	●		✓	✓	✓	✓	✓
	Maintain the pond by keeping the surrounds free of scrub. If aquatic vegetation smothers the pond so as to cover more than half the water surface, some clearing will be needed.	●		✓	✓	✓	✓	✓
	Maintain secure fencing	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
New butterfly Bank	Monitor butterfly species and numbers every year, ideally by transect across the mound and surrounding area, to gather data on invertebrates and vegetation changes.	●		✓	✓	✓	✓	✓
	Hand cut or pull tall species several times per summer. Remove tussocks of grass to provide open ground. Remove cut material from site. Aim for around 50% bare ground.	●		✓	✓	✓	✓	✓

Habitat	Management Prescription	Priority		Year 6	Year 7	Year 8	Year 9	Year 10
Whole Site	Check trees, check and maintain paths and access infrastructure, repair any damage. Collect litter.	●		✓	✓	✓	✓	✓
	Monitor species and habitat condition	●		✓	✓	✓	✓	✓
	Survey for under-recorded species		●	✓	✓	✓	✓	✓
	Continue programme of informal public events and conservation activities		●	✓	✓	✓	✓	✓
	Maintain and add records to the Mickleover Meadows and Mackworth Park Friends website		●	✓	✓	✓	✓	✓





Mickleover Meadows LNR and Mackworth Park Management Plan

Plan 3. Proposed new multi-user routes

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