PROPOSED DEVELOPMENT OF LAND AT BIRCHALL GARDEN SUBURB

HABITAT SURVEY

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1.0 BACKGROUND

1.1 Tarmac Trading Ltd are in the process of formulating proposals for the development of land near Welwyn Garden City known as Birchall Garden Suburb.

1.2 As part of the development process, Tarmac commissioned Philip Parker Associates Ltd (who have undertaken other survey work for them at Panshanger Park) to undertake various surveys to provide baseline ecological information to assist in the Ecological Impact Assessment (EcIA) process.

1.3 As part of the initial scoping exercise for the site, a habitat and botanical survey of the site was undertaken.

1.4 The report should be read in conjunction with Drawing 9.1.1 Ecological survey compartments and ponds.

2.0 LEGISLATION

2.1 The legislative provisions in Great Britain for the protection of wild plants are contained primarily in the Wildlife and Countryside Act, 1981, Section 13, with protected wild plants listed on Schedule 8, and the licensing and enforcement provisions in Sections 16-27. In England and Wales, enforcement provisions were extended by the Countryside Rights of Access Act, 2000, Section 81 and Schedule 12.

2.2 Section 14 of the Wildlife and Countryside Act 1981 (amended 2010) is to prevent the release into the wild of certain plants and animals which may cause ecological, environmental, or socio-economic harm. Section 14A (2) refers to plants, specifically plants listed on Part 2 of Schedule 9 of the Wildlife and Countryside Act.

2.3 The protection of European plant species in Great Britain is covered by the Conservation (Natural Habitats, etc.) Regulations, 1994, Part II, Regulations 42-46, with the wild plant species listed on Schedule 4.

2.4 All flowering plant species in both the United Kingdom and England have also been assessed against the IUCN 2001 guidelines to produce Red Lists of species considered to be Critically Endangered, Endangered, Vulnerable or Lower Risk (Near Threatened) or Lower Risk (Least Concern). Plant species may also be considered Nationally Rare or Scarce based on their national distribution.

2.5 UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The original lists of UK BAP priority species and habitats were created between 1995 and 1999, and were subsequently updated in 2007, following a 2-year review of UK BAP processes and priorities, which included a review of the UK priority species and habitats lists. As a result of new drivers and requirements, the 'UK Post-2010 Biodiversity Framework', published in July 2012, has succeeded the UK BAP. In particular, due to devolution and the creation of country-level biodiversity strategies, much of the work previously carried out under the UK BAP is now focussed at a country level. In England the UK BAP lists of priority species and habitats have been used to help draw up statutory lists of species and habitats of principal importance in as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006(England).

3.0 OBJECTIVES OF THE SURVEY

3.1 The objectives of the habitat and botanical survey were as follows:

- To split the site into a range of feature types (Woodland, mosaics, grassland, arable, ponds and boundaries)
- To identify and plot the various habitat types associated with these features in accordance with the published habitat guidelines
- Identification of any rare or scarce plant species occurring on the site

3.2 The area to the north of B195 Cole Green Lane and Birchall Lane is predominantly arable land with hedges, ponds and areas of broadleaved semi-natural and mixed plantation woodland. On the north-eastern edge it is bounded by the housing estates of Welwyn Garden City and a public open space known as Moneyhole Lane Park. To the north it is bounded by Panshanger aerodrome and arable land, while to the north-east it is bounded by Panshanger Lane, beyond which there are areas of woodland, a large property with extensive gardens and active and restored quarry excavations.

3.3 The area to the south of Cole Green Lane is largely occupied by a restored landfill site which has a mix of horse-grazed semi-improved pasture and areas of recent tree planting. To the south there are areas of arable cultivation with established hedgerows. Along the eastern side there is an area of semi-natural broadleaved woodland, containing a number of ponds. The A414 forms the southern and eastern boundary of the survey area. The Commons Local Nature Reserve runs along much of the western boundary.

3.4 The survey area is in the London Basin Natural Area. The London Basin is a large, trough-like basin which was formed around 50 million years ago, and is filled mostly with sands and clay sediments. About one-third of the area is covered by London and the wildlife of the Natural Area is characterised by islands of semi-natural habitats. These habitats include large areas of woodland, with extensive stands of mature beech woods, significant areas of lowland mixed deciduous woodland and numerous large wood pastures and parklands.

3.5 The site itself is very characteristic of the Natural Area. It comprises a large area in arable cultivation surrounded by stands of mixed deciduous woodland, parts of which have been replanted. Some of the fields retain hedgerows, dominated by common hawthorn *Crataegus monogyna*. There is a significant number of mature trees within the survey area mostly associated with hedgerows.

4.0 SURVEY METHODOLOGY

4.1 An extended Phase 1 survey of the northern half of the area was initially carried out on the 3rd May and 21st June 2011 as part of a scoping exercise for the proposed mineral extraction using the methodology given in the NCC Phase 1 Survey Handbook. A repeat visit was made on 27th March 2014 to verify the 2011 results, and some areas were re-visited again in June and October 2014. A scoping survey of the southern half of the area was carried out on 27th and 31st March 2014. The majority of the detailed recording was carried out on 10th June, 14th June and 3rd August 2014, with a final visit on 22nd October 2014, to verify the habitat map.

4.2 As the site is extensive, codings have been given to the various habitat features and boundaries. These are shown on Figure 1.1.

4.3 **Survey personnel**

The habitat survey was undertaken by Sarah Lambert BSc (Hons.) Class 1, Southampton University, 1982 Member of the Botanical Society of Britain and Ireland and currently BSBI Recorder for VC53 (South Lincolnshire); member of Lincolnshire Naturalists' Union; current Chair of Peterborough Local Group and former member of Council and the Conservation Committee of the Bedfordshire, Cambridgeshire and Huntingdonshire Wildlife Trust.

4.4 **Survey constraints**

The extended Phase 1 survey was carried out on multiple occasions in 2011, 2014 and 2015, with the bulk of survey being carried out between May and October and encompassing five visits in the peak survey season of May to August. Virtually all parts of the site were walked over, but because of the large size and complexity, some species will have been overlooked. However, the number involved is likely to be small and it is not considered that any omissions will have a material effect on the overall findings of the extended Phase 1 survey.

5.0 SURVEY RESULTS

5.1 HABITAT DESCRIPTIONS

The results of the extended Phase 1 habitat survey are shown on Drawing Figure 1.2 and plant species lists for each compartment, arranged by broad habitat, are given in a separate spreadsheet, which also includes plant species lists for boundary features (Appendix 9.1). Detailed notes and photographs of each compartment which contains significant ecological interest (including boundary features) are given in accompanying data sheets (Appendix 9.2). Each hedgerow has been assessed against the Hedgerow Regulations 1997 and the details of these can be found in Appendix 9.3. A description of the main habitat types and their characteristics is given below. Codes given are taken from the Phase 1 Handbook (JNCC 2010).

5.2 Woodland, broadleaved, semi-natural A1.1.1

There are three main blocks of mature semi-natural broadleaved woodland within the survey area, plus a number of smaller stands associated with habitat features such as streams and ponds. The main areas are located:

- Near the northern boundary of the site (Henry Wood W6)

- In the north west part of the site where two large woods (Rolls Wood W1 and Blackthorn Wood W2) are located to the north of Cole Green Lane but are contiguous with two smaller areas of semi-natural woodland to the south of the road (W3 and the north-west corner of W4)

- In the east of the site, centred around Greater Captain's Wood (W9), but with bands extending south on both the east and west side. The eastern extension (Holwell Park Wood, W10) follows a slight valley and contains a number of ponds (P9, P17-24)

5.3 The woodland is predominantly broadleaved, and much appears to be of ancient origin. Henry Wood, most of Rolls Wood, Greater Captain's Wood and a small area of Holwell Park Wood are included within the Ancient Woodland Inventory, but other areas, particularly the south-east corner of Blackthorn Wood (W2) are similar in character and contain characteristic ancient woodland species. As it is difficult to be sure of the origins without more detailed historical research, all the mature broadleaved woodland is coded as broadleaved semi-natural.

5.4 Much of the semi-natural woodland is dominated_by formerly coppiced hornbeam *Carpinus betulus* with variable amounts of pedunculate oak *Quercus robur* , ash *Fraxinus excelsior* and silver birch *Betula pendula*. There are some particularly fine hornbeam coppice stools on the

eastern boundary of Blackthorn Wood, along the northern boundary of Greater Captain's Wood and along the western boundary of Henry Wood. Many of the standard oak are only of moderate size, but there are a number of more mature specimens in Rolls Wood (W1).

5.5 There have been variable amounts of planting into some of the woodlands. Large parts of Blackthorn Wood appear to have been felled relatively recently, which has allowed dense stands of silver birch to develop, but there are also a number of recently planted trees, including wild cherry *Prunus avium*, pedunculate oak and sessile oak *Quercus petraea*. Henry Wood (W6) has also been subject to past planting, with considerable areas of sweet chestnut *Castanea sativa* coppice present, as well as a scatter of Scot's pine *Pinus sylvestris*.

5.6 The shrub layer is mostly fairly open structured, though occasionally dense and is dominated by holly *Ilex aquifolium*, with frequent hawthorn *Crataegus monogyna* and occasional to locally frequent hazel *Corylus avellana*. Goat willow *Salix caprea* , grey willow *S.cinerea* and blackthorn *Prunus spinosa* are locally frequent in damper areas, while elder *Sambucus nigra* is characteristic of more disturbed woodland.

5.7 The ground flora is patchy, with areas of dense bramble *Rubus fruticosus* agg. and common nettle *Urtica dioica*, interspersed with more open communities where characteristic ancient woodland species, such as bluebell *Hyacinthoides non-scripta* and wood anemone *Anemone nemorosa*, may be locally abundant. Bracken *Pteridium aquilinum* is locally dominant on the more acid soils of Greater Captain's Wood (W9) and in Henry Wood (W6). Greater Captain's Wood also has very frequent male fern *Dryopteris filix mas* and broad buckler-fern *Dryopteris dilatata*.

5.8 More open conditions along paths support a somewhat richer flora. Species such as rough meadow-grass *Poa trivialis*, ground ivy *Glechoma hederacea* and wood avens *Geum urbanum* are most abundant, but a number of ancient woodland species including frequent remote sedge *Carex remota*, wood sedge Carex *sylvatica* , wood millet *Milium effusum* and wood speedwell *Veronica montana* are also locally frequent. The most waterlogged paths are found in W1, and have areas of water-starwort *Callitriche* agg. and wavy bittercress *Cardamine flexuosa*. W1 also contains a number of waterlogged hollows and seasonal pools, which support wetland species such as lesser pond-sedge *Carex acutiformis*, remote sedge, floating sweet-grass *Glyceria fluitans* and brooklime *Veronica beccabunga*.

5.9 Holwell Park Wood (W10) is partly fed by base-rich water and here the canopy is more heavily dominated by ash, with field maple *Acer campestre* and locally frequent to abundant willows *Salix* spp and dogwood *Cornus sanguinea*. The ground flora also contains characteristic species of more base-rich soils such as dog's mercury *Mercurialis perennis*, bugle *Ajuga reptans* and primrose *Primula vulgaris*. Small areas of similar woodland are also present

towards the north-west corner of Blackthorn wood (W2), along the south-facing boundary of Henry Wood (W6) and in W3.

5.10 **Woodland, broadleaved, plantation A 1.1.2**

There are a number of different types of planted woodland within the survey area, which vary in age and location.

5.11 The largest continuous area of plantation is in M7. Towards the southern end of the compartment the trees are semi-mature and form a closed canopy, with a ground flora of bramble and nettle. Further north, the trees are younger and more widely scattered, and do not appear to be thriving, with may stunted and dying specimens. This has allowed the establishment of grassland and marsh communities amongst them. A very wide range of species has been planted, predominantly native species such as ash, pedunculate oak, hornbeam, wild cherry, alder *Alnus glutinosa* and silver birch, but with a number of amenity species such as hybrid black-poplar *Populus* x *canadensis*, white poplar *Populus alba*, grey alder *Alnus incana* and cherry-plum *Prunus cerasifera*. In the north-west corner there is a large stand of callery pear *Pyrus calleryana*.

5.12 Two smaller semi-mature mixed broadleaved plantations along the A414 (W8 and M10) were presumably established as part of the landscaping for the road scheme. They contain species such as ash, pedunculate oak, field maple, hornbeam, silver birch and poplars *Populus* spp with a scatter of Scot's pine in W8. The understorey is generally a mix of rank grass, nettle and bramble. W8 is of somewhat greater interest as there are veteran hornbeam and oak around its boundary, and the ground flora contains a few woodland indicator species such as primrose, lords-and-ladies and common figwort *Scrophularia nodosa*.

5.13 Further areas of semi-mature mixed plantation are present: one in the north-east corner of M5, which contains a higher proportion of willows *Salix* spp.; one in W4, which is variously dominated by white poplar and ash; and one and in W11, which is dominated by poplars with locally frequent sycamore, silver birch and wild cherry. A similar poplar-dominated mix, with locally frequent ash and field maple, is widely used in the land-filled area as a boundary feature (B27, B30, B35 and B38). All these areas of plantation have a poor ground flora, dominated by species such as common nettle, cleavers, bramble, rough meadow-grass and cow parsley.

5.14 In the northern part of the survey area a shelter belt has been recently planted along the southern and western boundary (B1, B13 and B17). This appears to have been established in the last five to ten years. A wide range of species has been used in these plantings, including common hawthorn, field maple, silver birch, oak, wild rose *Rosa canina*, sweet-briar *Rosa rubiginosa*, and Scot's pine. There is dense rank vegetation between the trees, dominated by

sterile brome *Anisantha sterilis*, false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata* and black grass *Alopecurus myosuroides*, with frequent to abundant prickly ox-tongue *Helminthotheca echioides* and common ragwort *Senecio jacobaea* beneath them. Additional areas of young plantation are found in M6, where aspen *Populus tremula* is locally frequent, but here, rabbit grazing has retained a more species-rich type of grassland beneath the planted trees.

5.15 As well as plantations on open ground there are areas of relatively recent re-planting into established woodland in both W6 and W9 (and to a lesser extent in W2), comprising a range of broadleaves such as pedunculate oak, ash and wild cherry.

5.16 **Woodland, plantation, mixed A 1.3.1**

Birchall Wood (W5) is a mixed plantation on an ancient site. In some areas the canopy is dominated by Scot's pine, though silver birch is also very frequent. There is also frequent self-seeded sycamore and young oak. Other planted species which are locally frequent include wild cherry, larch *Larix decidua* and sweet chestnut. More recently there has been planting of pedunculate oak, silver birch and wild cherry. There is a fine set of hornbeams around the western, eastern and southern boundaries of the wood, which show evidence of having been laid in the past. The shrub layer is generally sparse and is dominated by elder, with birch and oak saplings. The ground flora is dominated by bluebell and bracken with frequent bramble and locally abundant wood anemone.

5.17 **Scattered trees A 3.1**

A small number of mature to over-mature trees are now located within arable land, either as single trees, as small groups or along boundary features such as ditches or tracks. Pedunculate oak is the most frequent species, but there are also examples of veteran ash, field maple and hornbeam associated with such features. The largest group of mature and veteran trees is located to the south-west of Birchall Wood, along former hedge-lines. These include features such as rot holes, dead wood and trunks densely covered by ivy *Hedera helix*.

5.18 **Scrub A 2.1 (dense continuous) A 2.2 (scattered)**

There is relatively little scattered scrub within the survey area. In the northern part of the survey area it is a feature of former field boundaries, probably where hedgerows have been lost, and tends to be dominated by bramble and blackthorn. In the southern part of the survey area it occurs within some of the less heavily grazed semi-improved grasslands of the landfill area, particularly G4, where hawthorn and dog-rose are locally frequent. Scattered scrub is frequent along the north-western end of the cycleway and along the fenced boundaries to many of the grazed fields in the landfill area. Blackthorn is a particular feature of such areas,

but a moderate variety of species is present including ash, alder and a number of non-native species such as Hupeh crab *Malus hupehensis*.

5.19 Scattered and moderately dense scrub are a feature of M3, with grey willow being most frequent in the damper parts of the compartment, while sycamore *Acer pseudoplatanus* is locally abundant on somewhat drier soils.

5.20 Areas of dense scrub are also relatively restricted in extent. In M4 areas of dense blackthorn and grey willow merge into more established woodland along a stream valley. A stand of dense grey willow and blackthorn scrub is also present in M11.

5.21 To the north of W12 an area of dense mixed scrub, including hawthorn, blackthorn, rose, pedunculate oak and hornbeam, with abundant bramble, has developed in a small triangle of former arable land between the wood and an established shelter belt.

5.22 **Grassland, neutral , semi-improved /unimproved B 2.2**
Semi-improved grassland occupies approximately 50% of the southern part of the survey area. The majority of the grassland has been established during restoration of an infilled quarry, is recent in origin and is managed by horse grazing (G4-G10). There are smaller areas of neutral grassland, which share many characteristics of the horse-grazed pasture in M3, M4, M6 and M7, and these form a mosaic with areas of tall ruderal vegetation and scrub. These areas are generally unmanaged, although rabbit grazing has a localised impact on the sward.

5.23 The grassland is quite variable in both structure, moisture content and species-richness, and there is significant variation within compartments. This level of detail cannot be represented easily on a Phase 1 map, and therefore it has been necessary to make a broad-based judgment as to as to whether a n area contains species-rich semi-improved grassland or species-poor semi-improved grassland. This decision is based on visits made in June 2014, but changes in grazing pressure or other management can affect grassland quality very rapidly. Within the broadly applied categories, there will be anomalous areas, so a generally more species-rich grassland may contain areas of quite species-poor sward.

5.24 Despite the variations, there is a rather consistent suite of species associated with all semi-improved and unimproved grassland in the survey area. In well grazed areas the sward is dominated by a mix of predominantly fine grasses including red fescue *Festuca rubra* agg., common bent *Agrostis capillaris*, smooth meadow-grass *Poa pratensis*, lesser cat's-tail *Phelum bertolonii* and crested dog's-tail *Cynosurus cristatus*, with frequent to locally abundant perennial rye *Lolium perenne*.

5.25 In somewhat less heavily grazed swards species such as Yorkshire fog *Holcus lanatus*, meadow barley *Hordeum secalinum*, and cock's-foot *Dactylis glomerata* become more prominent, while in very lightly grazed swards there can be significant amounts of false oat-grass *Arrhenatherum elatius* and tall fescue *Schedonorus arundinaceus*.

5.26 Many of the grass fields have poorly-drained areas on clay, which can be associated with hollows or occur more extensively on plateaux. Creeping bent *Agrostis stolonifera* is particularly abundant in these conditions, and in the wettest areas it may occur with marsh foxtail *Alopecurus geniculatus*. In G8 a small number of winter-wet hollows support floating sweet-grass *Glyceria fluitans* and a small population of pond water-crowfoot *Ranunculus aquatilis*.

5.27 As might be expected, the herbaceous component is more varied than the suite of grasses which occur. Some areas of rank grassland are very species-poor and ruderal herbs such as common ragwort *Senecio jacobaea,* hoary ragwort *Senecio erucifolius, ,* spear thistle *Cirsium vulgare,* creeping thistle *Cirsium arvense*, curled dock *Rumex crispus* and teasel *Dipsacus fullonum* are the most abundant associates. More generally the most frequent herbaceous associates include white clover *Trifolium repens*, common mouse-ear *Cerastium fontanum*, cut-leaved crane's-bill *Geranium dissectum*, ribwort plantain *Plantago lanceolata*, creeping cinquefoil *Potentilla reptans*, creeping buttercup *Ranunculus repens* and dandelion *Taraxacum* agg.

5.28 The better quality grasslands are more herb-rich, and often contain a high proportion of leguminous species, a typical feature of recently established grasslands on nutrient-poor soils. These include frequent to locally abundant black medick *Medicago lupulina*, bird's-foot-trefoil *Lotus corniculatus*, lesser trefoil *Trifolium dubium*, red clover *Trifolium repens*, and most notably, grass vetchling *Lathyrus nissolia*, which is very abundant in G4, G5, G10, M6 and M3. Other locally frequent herbaceous species within the grazed pastures include ox-eye daisy *Leucanthemum vulgare* and wild carrot *Daucus carota*, both of which are particularly abundant in G4.

5.29 Grasslands outside the grazing area are essentially quite similar in species composition, but are more structurally diverse. A number of indicators of unimproved neutral grassland occur more frequently in these smaller area of ungrazed grassland, particularly common knapweed *Centaurea nigra*, which is locally frequent in M5, M6 and M7, perforate St.Johns'-wort *Hypericum perforatum*, meadow vetchling *Lathyrus pratensis*, lesser stitchwort *Stellaria graminea,* agrimony *Agrimonia eupatoria,* germander speedwell *Veronica chamaedrys* and bee orchid *Ophrys apifera*.

5.30 The mosaic areas also provide more opportunities for ephemeral species which require parched, open conditions although locally suitable conditions are also present on heavily grazed mounds in G8 . Characteristic species of such conditions include common whitlow-grass *Erophila verna*, sticky mouse-ear *Cerastium glomeratum*, wall speedwell *Veronica arvensis* and common stork's-bill *Erodium cicutarium*.

5.31 **Grassland, improved B 4**

There is a field of recently sown improved grassland dominated by rye-grass *Lolium* sp. to the west of P5 (G1).

5.32 **Marshy grassland B 5**

There are three areas of marshy grassland in the southern half of the survey area. The best developed areas of marshy grassland are located in M7, but even here the habitat may be too young to have colonised fully. Some areas, particularly towards the western part of the wetland, are dominated by hairy sedge *Carex hirta* with locally abundant bugle *Ajuga reptans*, while other areas support a mix of hard rush *Juncus inflexus*, great willowherb and marsh thistle *Cirsium palustre* with abundant pointed spear-moss *Calliergonella cuspidata*. The marshy grassland is not very species-rich, though a small number of characteristic wetland species are present at low density including marsh bedstraw *Galium palustre*, greater bird's-foot-trefoil *Lotus pedunculatus* and green-ribbed sedge *Carex binervis*.

5.33 An area of low-lying former arable land in M8, which has been abandoned for a number of years, supports developing marshy grassland, which is present with more extensive areas of ruderal tall herbs including great willowherb, common nettle and creeping thistle. The grassland is dominated by Yorkshire fog, with occasional areas of hard rush and wood small-reed *Calamagrostis epigejos*. There is a scatter of wetland species including locally frequent bugle and marsh thistle, and occasional ragged robin *Silene flos-cuculi* and wild angelica *Angelica sylvestris*. A shallow drain along the eastern side of the area has stands of meadowsweet *Filipendula ulmaria*, hemp agrimony *Eupatorium cannabinum* and great horsetail *Equisetum telmateia*.

5.34 The least interesting area of marshy grassland is at the southern end of M3, and is dominated by tussocks of pendulous sedge *Carex pendula*, with locally abundant great willowherb and hard rush, over an understorey of creeping bent. Other wetland species are scarce, but include meadow buttercup *Ranunculus acris* and meadow foxtail *Alopecurus pratensis*.

5.35 **Tall herb, ruderal C3**

Tall ruderal herbs are present as a thin margin around many of the arable field margins as well as around hedgerows and ponds. This vegetation is dominated by species such as common

nettle, creeping thistle, sterile brome *Anisantha sterilis*, soft brome *Bromus hordeaceus*, field brome *Bromus commutatus*, cow parsley, hogweed and hemlock *Conium maculatum*. It is more extensive in M11, which is a formerly arable area that has been allowed to tumble down to scrub and ruderal vegetation.

5.36 There are more extensive areas of ruderal vegetation within many of the mosaic compartments, particularly M3, M4 , M7 and M8, and in areas of recent tree planting. Many of the species listed above remain frequent to locally abundant, particularly creeping thistle and hemlock, but additional species are particularly prominent, notably teasel *Dipsacus fullonum*, common ragwort, hoary ragwort and goat's-rue *Galega officinalis*. Areas of tall ruderal vegetation often occur in association with rank grassland dominated by false oat-grass, and also occur patchily within areas of horse-grazed semi-improved grassland. Tall ruderals are a feature of the grassland fringing the cycleway that crosses the southern half of the survey area.

5.37 Great willowherb is locally abundant to dominant in damp conditions, particularly in M7 and M8 and along the wood edge of B40. In M7 it occurs with abundant common nettle and creeping thistle on an area of former arable land. In M8 it is abundant in an area of marshy grassland with frequent hard rush and marsh thistle.

5.38 **Ephemeral / short perennial vegetation J 3**

Two small areas support a mix of ephemeral / short perennial vegetation, likely to have originated from a bird-seed mix, but not obviously managed during 2014.

5.39 A suite of species occurs on the raised area on the eastern side of M8. The dominant perennial species in this area is bristly ox-tongue, with frequent creeping and spear thistle and locally abundant lesser hawk's-beard *Crepis capillaris*. Broomcorn millet is again frequent, along with other species of bird-mixes such as phacelia *Phacelia tanacetifolia* and borage *Borago officinalis*. There is a good range of characteristic arable species, the most abundant of which is fat-hen *Chenopodium album*, but also includes frequent field madder *Sherardia arvensis* and occasional marsh cudweed *Gnaphalium uliginosum*, parsely-piert *Aphanes arvensis* and many-seeded goosefoot *Chenopodium polyspermum*.

5.40 **Open water, eutrophic and marginal vegetation E 1.1**

There are a number of water bodies within the survey area, which vary in size and character.

5.41 The largest area of open water is the Fishing Lake, (P10). Its edges are generally abrupt and often boarded, with very little emergent vegetation. Some stretches of margin are shaded by woody vegetation but much of the lake is open. No aquatic macrophytes were recorded, but the marginal species include frequent gipsywort *Lycopus europaeus* and yellow iris *Iris*

pseudacorus. Sweet flag *Acorus calamatus* is locally frequent. Wetland vegetation on the fringes is again patchy and dominated by hard rush and great willowherb, with locally frequent fleabane *Pulicaria dysenterica*.

5.42 The most diverse single area of open water is P5, which is a long sinuous pond surrounded by a mix of scrub, trees and semi-improved grassland. It has areas of swamp, but also areas of shallow open water that support a range of emergent species including flowering rush *Butomus umbellatus*, fine-leaved water-dropwort *Oenanthe aquatica*, water-cress *Nasturtium officinale* agg., celery-leaved buttercup *Ranunculus sceleratus*, water dock *Rumex hydrolapathum* and woody nightshade *Solanum dulcamara*.

5.43 The majority of the ponds are located in woodland or scrub and are heavily shaded, which limits development of wetland vegetation. Some of the ponds dry up and others are devoid of any aquatic or marginal vegetation. P2 and P3 are relatively permanent, with stands of yellow iris and scattered branched-bur-reed, and a wetland fringe of remote sedge, soft rush *Juncus effusus* and woody nightshade. Aquatic vegetation is limited to the floating thalli of least duckweed *Lemna minuta*. P23 and P24 both appear to dry up in summer and have very limited wetland vegetation.

5.44 The most interesting suite of woodland ponds is P17-22, which vary from shaded leaf-filled shallow pools almost devoid of wetland vegetation, to shallow vegetated swamp with remote sedge, cyperus sedge *Carex pseudocyperus*, woody nightshade, water-cress, gipsywort and great willowherb, to bulrush swamp and a shallow pool filled with yellow iris. These ponds are at least partly fed by seepages from M7, and the local abundance of great horsetail is dependent on this, being restricted to spring-lines, seepages and flushes on base-rich clay soils.

5.45 Three ponds are located within or close to arable land. P1 is surrounded by scrub and dries up in summer. Much of the pond is dominated by a mix of herbaceous species including abundant cleavers, silverweed *Potentilla anserina*, curled dock *Rumex crispus* and common nettle. The dampest areas have abundant creeping jenny *Lysimachia nummularia* and locally frequent marsh bedstraw and bladder sedge *Carex vesicaria*. P29 is an isolated pond in the middle of an arable field close to an oak tree. It holds shallow water, with dense branched bur-reed and scattered woody nightshade, and has a margin of great willowherb and common nettle. P4 is a very shallow, unshaded pond at the edge of a recent plantation, which floods into the adjacent arable land during winter. It contains algal mats, but no aquatic macrophytes. It supports a variety of marginal and wetland species including frequent reed sweet-grass *Glyceria maxima*, floating sweet –grass, woody nightshade and water plantain *Alisma plantago-aquatica*.

5.46 **Swamp F 1**

Swamp vegetation is present in some of the larger, more open ponds, particularly P12-13, P14-16 and P5. The dominant swamp species is bulrush *Typha latifolia*, which forms extensive stands. Locally, particularly in P12, lesser pond-sedge *Carex acutiformis* is abundant to dominant and branched bur-reed is locally abundant in P5 and P29.

5.47 **Arable land J 1**

The majority of the northern part of the survey area is occupied by arable land, used for growing cereal crops. Arable land is also present in the south-west and north-east parts of the southern survey area. Most of the crop area is free from weeds, with a narrow margin of rank grassland and tall ruderal herbs along the field boundaries. Field edges are characterised by annual species of grass typical of disturbed habitats, including sterile brome *Anisantha sterilis*, soft brome *Bromus hordeaceus*, black-grass *Alopecurus myosuroides* and wild oat *Avena fatua*. In the south-west part of the site, field brome *Bromus communtatus* is locally abundant, along with the rare rye-brome *Bromus secalinus*. Other frequent annual species of the crop margins include common field-speedwell *Veronica persica*, field forget-me-not *Myosotis arvensis*, cut-leaved crane's-bill, annual meadow-grass *Poa annua* and scarlet pimpernel. Toad rush *Juncus bufonius* is locally frequent in damp corners.

5.48 Several areas have somewhat higher interest. A strip of parched field boundary to the south of Birchall Wood (B3) supports a stand of bur chervil *Anthriscus caucalis*, which is growing in association with parsley-piert *Aphanes* sp., dove's-foot crane's-bill *Geranium molle* and least mallow *Malva neglecta*. An area of margin at the junction of B6 and B8 has a good range of arable weeds including abundant scented mayweed and occasional common poppy *Papaver rhoeas*. One plant of cornflower was recorded in 2011. The track along the western boundary of A15 supports a moderately rich arable weed flora with abundant scented mayweed and rat's-tail fescue *Vulpia myuros* with locally frequent parsley-piert, field madder *Sherardia arvensis*, least swine-cress *Lepidium didymum* and occasional wild radish *Raphanus raphanistrum*, common poppy and sharp-leaved fluellen *Kickxia elatine*.

5.49 **Boundaries, hedges J 2**

Established hedgerows are a feature of those parts of the survey area in arable cultivation, particularly to the north of Birchall Lane and in the south-west part of the site, between Holwell Hyde Farm and Burnside. The most frequent type are low to medium mixed hedgerows, between 3 and 4 metres in height, dominated by common hawthorn, but with locally frequent hornbeam and blackthorn. They are generally fairly species-poor, with an average of between 3 and 5 species recorded from a 30m sample stretch. Standard trees are a feature of some hedges, predominantly pedunculate oak and ash. Other associated hedgerow species include field maple, crab apple, spindle *Euonymus europaeus*, dogwood *Cornus sanguinea*, holly *Ilex aquifolium* and wild privet *Ligustrum vulgare*, though mature examples of these species tend

to be confined to better-quality hedges that have clearly been present for a considerable time. Most hedges have no true hedgerow flora and merely support a narrow strip of rank grassland at the base with frequent common nettle, cleavers, hogweed, cow parsley and occasional rough chervil *Chaerophyllum temulum*.

5.50 Recently planted hedges are present along the boundary of the A414, along parts of the Birchall Road, around part of the boundary to The Commons LNR and occasionally within the infilled area. The newly planted hedgerows are somewhat variable, with some areas being dominated by hawthorn or blackthorn, whilst others are more mixed and contain recently planted woodland species such as field maple, dogwood, hazel and spindle. Most of the newly established hedges do not have any associated standard trees, although some young trees are establishing locally, particularly along the A414.

5.51 Hedges that are of particular note include:

- The hedges that border the Green Lane at the southern end of B1, which are of ancient origin, and contain some very sizeable hornbeams, which show evidence of having been laid in the past. They also support the most diverse hedgerow flora containing woodland species such as bluebell, dog's mercury, greater stitchwort, wood sedge, wood melick *Melica uniflora*, lords-and-ladies and lesser celandine *Ficaria verna*
- The hedge along Panshanger Lane (B8), which is also at least partially of ancient origin, though much of it is very gappy, with areas of bramble. In the north it resembles a line of trees and is mostly dominated by sycamore. It contains a woodland flora including bluebell, dog's mercury, cuckoo pint and lesser celandine, though each of these is quite rare
- B4, B6, B9 and B10, which support several fine mature and veteran oak and ash, as well as some very sizeable hornbeam which have been laid in the past.
- The southern end of B21, which is a fine example of a mature mixed hedge located alongside a water-filled ditch, which includes a wide range of species such as field maple, dogwood, spindle and crab apple. It also contains a number of significant hazel coppice stools.
- B33, which is a wide hedge dominated by hornbeam that supports some very large veteran oaks. It is locally quite species-rich, and contains locally frequent crab-apple and dogwood, as well as some large coppiced field maple, ash and hazel.

5.52 A complete assessment of the hedgerows on site can be found in Appendix 9.3.

5.53 **Boundaries, ditches and streams J 2**

Permanent watercourses are only found in the southern half of the survey area. A stream flows south through M4, but is mostly heavily shaded, except where it has been dammed into two ponds (P12 and P13): no wetland vegetation was recorded from the stream itself.

5.54 To the east of Holwell Park Wood two streams flow south and east along B21 and B22. They join at the southern end of B22 and exit the site through a culvert under the A414. These streams are partially shaded by hedges, but in the more open areas species such as fools water-cress *Apium nodiflorum*, floating sweet-grass and water-cress are locally abundant to dominant.

5.55 **RARE SPECIES**

All flowering plant species in the United Kingdom have been assessed against the IUCN 2001 guidelines to produce a Red List of species considered to be Critically Endangered, Endangered, Vulnerable or Lower Risk (Near Threatened) in the United Kingdom. More recently the same criteria have been used to assess the status of all vascular plant species in England (Stroh et al. 2014). Species may also be considered Nationally Rare or Scarce based on their national distribution, and a number of species have been given priority status in the UK Biodiversity Action Plan.

5.56 Eight species falling into the above categories have been recorded from the site:

- Rye-brome *Bromus secalinus* is Nationally Scarce, listed as Vulnerable on the UK Red List and as Near Threatened in the England Red List
- Bladder sedge *Carex vesicaria* is listed as Vulnerable on the England Red List
- Cornflower *Centaurea cyanus* is listed as a Priority Species in the UK and England Biodiversity Action Plans
- Wild strawberry *Fragaria vesca* is listed as Near Threatened on the England Red List
- Field scabious *Knautia arvensis* is listed as Near Threatened on the England Red List
- Early meadow-grass *Poa infirma* is Nationally Scarce
- Ragged-robin *Silene flos-cuculi* is listed as Near Threatened on the England Red List
- Heath speedwell *Veronica officinalis* is listed as Near Threatened on the England Red List

5.57 In addition fine-leaved water-dropwort *Oenanthe aquatica*, which is listed as Rare in the Hertfordshire Plant Red Data List, has been recorded from the site.

5.58 The location, status and ecological requirements of each of these species is discussed further below.

5.59 **Rye-brome *Bromus secalinus***

Figure 1 Rye-brome

Rye-brome is an annual or biennial of cereal fields which has probably been in Britain since prehistoric times as an arable weed or possibly as an alternative source of grain when the main crop failed. It was frequent in the 19th and early 20th centuries but underwent a dramatic decline in the middle part of the 20th century. In some areas, including Hertfordshire, it seems to be staging something of a come-back. It was only known from a handful of localities in the county until 1991 but since then it has begun to turn up occasionally in a number of places, scattered across the county, usually in winter wheat and sometimes in large quantities alongside field brome. At Birchall it was locally abundant on arable field margins in the south-west part of the site (A14 and A15) in just such conditions. The recent increases account for its differing Red List statuses in the UK (Vulnerable) and England (Near Threatened).

5.60 **Bladder sedge *Carex vesicaria***

Bladder sedge is a perennial herb of wet habitats, mainly mesotrophic and at least slightly basic, occurring where the water table lies close to or above the soil surface. It is found in a variety of wetland habitats including ponds, ditches and depressions in pasture and in wet woodland. It has been lost from many sites in England since the 1960's as a result of drainage, falling water tables and eutrophication. In Hertfordshire it is a scarce plant of sometimes shaded, often wooded pools and was formerly fairly frequent on the upland clays and gravels across southern and central Hertfordshire. A population of bladder sedge was recorded from P1 in 2011, occupying a moderately shaded area that is clearly flooded in winter and damp in summer.

5.61 **Cornflower *Centaurea cyanus***

Cornflower formerly occurred as an arable weed, but is now most often recorded from waste places and rubbish tips as a casual arising from gardens and wild flower seed mixtures. The native population underwent a dramatic decline as a result of better seed cleaning and

Figure 2 Cornflower

herbicide use, which resulted in it being classified as Endangered in the 1991 Red Data Book. Records of the species have increased since the 1980's, but most of these are probably of the continental strain used in wildflower mixtures. Cornflower is also a Priority Species in the Hertfordshire Biodiversity Action Plan. In Hertfordshire it was apparently frequent as a cornfield weed, especially on the chalk. In the 1950s it still occurred regularly in a few fields to the east of Baldock. In recent years an irregular population has been recorded from a small area of arable fields in the London Colney area. This population is suspected to be native. Other scattered records are all thought to result from introduced seed, although some may result from chance germination of buried seed. At Birchall, in 2011 a single plant was found growing on an arable field margin at the south-west corner of A4 at TL 27493 12133, in association with other arable weeds including scented mayweed and common poppy, and is most likely to be a relict of wildflower seeding.

5.62 **Wild strawberry *Fragaria vesca***

Wild strawberry is a perennial stoloniferous herb of dry soils in woodland, scrub, hedge banks and open ground in quarries and pits. It is a very widespread species, occurring in all parts of the United Kingdom, but in England it has shown a 29% decline in its Area of Occupancy. It remains frequent in Hertfordshire, and at Birchall was recorded as locally frequent in M3, M6 and M7.

5.63 **Field scabious *Knautia arvensis***

This perennial herb of calcareous and neutral grassland on well-drained soils can be found in a variety of habitats including chalk and limestone grassland, rough pasture, open hedgerows and wood borders, as well as roadside verges and grassy waste ground. It has a very widespread distribution in the UK, being absent only form the uplands of the north and west. In England it has shown a 23% decline in its Area of Occupancy resulting in its current status of Near Threatened. It is widespread in Hertfordshire, but has shown a steady decline in abundance mainly owing to the poor management of road-side verges and loss of unimproved rough grasslands. At Birchall it was only recorded from the south-east corner of the site, with a single plant found growing in the rough grass verge associated with hedge B34.

5.64 **Fine-leaved water-dropwort *Oenanthe aquatica***

Fine-leaved water-dropwort is a tuberous perennial herb of still or slow-moving water, usually occurring on deep, silty, often eutrophic substrates in shallow ponds and ditches, often where water fluctuates in depth. It has declined throughout its British range, but particularly in the east. In Hertfordshire it is now a very rare plant of silted ponds on clay soils, tolerating some shading. It was formerly quite frequent in the Welwyn Garden

Figure 4 – Fine leaved water - dropwort

City area, and many of its former sites were destroyed during development of the town. Recently it has only been recorded from two sites, one at Knebworth and one at Welham Green. At Birchall two plants were recorded in 2011 from the sinuous pond north-east of Birchall Farm (P8), growing on deep silt, somewhat shaded by trees.

5.65 **Early meadow-grass *Poa infirma***

Early meadow-grass is a native species, which until recently grew near the sea in open, trampled grassland, on cliff-top paths, track-sides and picnic sites along the south-western and southern coast of Britain from Cornwall to Sussex. However, like many coastal species, it has recently spread north and east, and there are recent records from Cambridgeshire and Norfolk. It was first recorded from Hertfordshire in 2009, where it was found at The Campus, Welwyn Garden City. In March 2014 it was found in two locations at Birchall,in M4 and M9. In both cases it was growing on surfaced track margins. This species may be generally under-recorded, as it best recorded very early in the year, disappearing by mid-April, and may be overlooked as an unusual form of annual meadow-grass.

Figure 5 – Early Meadow Grass

5.66 **Ragged-Robin *Silene flos-cuculi***

Ragged-Robin is a herb of damp habitats, found in wet grassland, rush pasture, fen meadows, ditches, tall-herb fens and damp woodland margins. It is a very widespread species, occurring in all parts of the United Kingdom, but in England it has shown a 22% decline in its Area of Occupancy resulting in its current status of Near Threatened. It remains frequent in Hertfordshire and populations are considered to be locally stable. It was only recorded from the developing damp grassland in M8, and was very rare there.

5.67 **Heath speedwell *Veronica officinalis***

Heath speedwell is a perennial herb found in open woods and woodland rides, on banks, in grassland and in heathland. It grows on well-drained, often moderately acidic or leached soils. It is a very widespread species, occurring in all parts of the United Kingdom, but in England it has shown a 25% decline in its Area of Occupancy resulting in its current status of Near Threatened. It remains frequent in Hertfordshire and populations are considered to be locally stable, with losses being balanced by its colonization of disused gravel pits. At Birchall it was recorded as rare in W10 and M7.

6.0 ASSESSMENT OF VALUE AND SUMMARY

6.1 Although no NVC quadrats were recorded, the following NVC communities are considered to be present:

- MG1a/b *Arrhenatherum elatius* grassland
- MG5 *Centaurea nigra - Cunosurus cristatus* grassland
- MG6 *Lolium perenne - Cynosurus cristatus* grassland
- MG10 *Holcus lanatus -Juncus effusus* rush-pasture
- W8 *Fraxinus excelsior - Acer campestre – Mercurialis perennis* woodland
- W1 *Salix cinerea- Galium palustre* woodland
- W10 *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland
- W21 *Crataegus monogyna – Hedera helix* scrub
- W22 *Prunus spinosa - Rubus fruticosus* scrub
- S7 *Carex acutiformis* swamp
- S12 *Typha latifolia* swamp
- OV7 *Veronica persica - Veronica polita* community
- OV15 *Anagallis arvensis - Veronica persica* community
- OV24 *Urtica dioica - Galium aparine* community
- OV25 *Urtica dioica - Cirsium arvense* community
- OV26 *Epilobium hirsutum* community

6.2 Most of the communities recorded are frequent and widespread in lowland Britain. In order to assist with interpretation during the development process, the habitats present have been categorised according to their botanical value using criteria prepared by the Institute of Ecology and Environmental Management. This assessment is summarised below. Individual compartments (which may contain multiple habitats in mosaic) have also been graded in a site context: this information is contained within the individual data sheets.

6.3 **Woodland, mature, broad-leaved, semi-natural**

Lowland mixed deciduous woodland is a habitat of principal Importance under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The areas of semi-natural broadleaved woodland at Birchall are all of high conservation value.

6.4 Two main woodland NVC types are present. The majority of the woodland, in particular W1,W9, W5 and W6, as well as parts of W2 and W10 support *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland, which is characteristic of base-poor brown soils throughout the temperate lowlands of southern Britain. These woodlands are often dominated by oak, but birch is also very frequent, and hornbeam and sweet chestnut are locally

dominant. The ground flora is variable, with much being dominated by bramble or, more locally, bracken, but there are also extensive areas of bluebell in W6 and wood anemone in W9.

6.5 Areas which have more basic soils, or are influenced by flushing with basic water, support *Fraxinus excelsior - Acer campestre – Mercurialis perennis* woodland. This occurs to a greater or lesser extent in W10, W1, W2, W3 and W6. It is characterised by an increase in the frequency of ash and oak in the canopy, and the presence of species such as dog's mercury in the ground flora.

6.6 W1, W6, W9 and parts of W10 are recognised to be ancient woodland, but they have received variable amounts of management intervention. Table 1 shows the number of ancient woodland indicator species recorded from each woodland during the current survey; it represents a minimum, and greater survey effort would be likely to add to the figures.

6.7 The least modified area of semi-natural woodland, Rolls Wood (W1), supports the largest number of ancient woodland indicator species. Blackthorn Wood (W2) also has a large number of ancient woodland indicators, and it is considered likely that this is also of ancient origin, at least in part, although it has been more heavily modified by recent planting. Greater Captain's Wood and Holwell Park Wood (W9 and W10) are less intrinsically species-rich, because of the more acid soils in W9 and the rather limited extent of W10, but support a good number of ancient woodland indicators. The other areas of woodland have a somewhat more depauperate flora, with fewer ancient woodland indicators, which is generally a result of management issues such as re-planting with inappropriate species (W5 and W6) , of being very small in size (W7 and W12) or being secondary woodland (W4, W8 W11).

Table 9.1.1 Hertfordshire Ancient Woodland Vascular Plant species recorded from the woodland compartments during the current survey

NB W5 (mixed plantation on an ancient site) and W8 and W11 (recent plantation) are included for comparative purposes
The threshold for a woodland to be graded as a County Value site is that it is more than 1ha in size and has more than 10 ancient woodland indicators.

Compartment	Number of ancient woodland indicator species
W1	25
W2	17
W3	9
W4	2
(W5)	5
W6	7
W7	4
W8	2
W9	14
W10	9

Compartment	Number of ancient woodland indicator species
(W11)	0
W12	3

6.8 All the major areas of semi-natural woodland are designated as Local Wildlife Sites.

6.9 **Woodland, plantation, broadleaved**

The areas of broadleaved plantation woodland are all of relatively of recent origin. They are structurally uniform, contain a number of alien species and have a very poor associated ground flora. Their main value is to provide habitat for nesting songbirds and foraging mammals.

6.10 **Woodland, plantation, mixed**

W5 is recognised as being ancient woodland which has been heavily modified by planting, which includes a significant component of coniferous species. The ground flora contains some ancient woodland indicator species such as wood anemone and bluebell. Removal of the current crop of conifers would elevate the wildlife value of this area, and allow development of woodland dominated by oak and birch. This area is included within a County Wildlife Site.

6.11 **Scattered trees**

Veteran trees are generally recognised to be of extremely high nature conservation value. There are some mature oak and ash associated with hedgerows and ponds, and a small number isolated in arable fields. These trees are a valuable landscape scale feature, of high potential value for hole-nesting birds, bats and invertebrates. However, they are generally fairly scattered, and none are of any great age, which diminishes their value somewhat. The best assemblages of mature trees are found along B2 and B3, B6-10, B33 and B40.

6.12 **Scrub**

Scrub within the survey area either represents the last remnants of former hedges or has colonised unmanaged areas, particularly damp ground around ponds and along watercourses and fenced field boundaries in the infilled land. The scrub is mostly species poor, the main NVC communities being W21 *Crataegus monogyna – Hedera helix* scrub on well-drained soils, W22 *Prunus spinosa - Rubus fruticosus* scrub on damp soils and W1 *Salix cinera-Galium palustre* woodland in wet areas The scrub has some local value, particularly for nesting songbirds, but also increases shading of ponds, wetland vegetation and grassland, to their possible detriment.

6.13 **Grassland, neutral, semi-improved**

Much of the infilled area supports recently established grassland, which varies in structure and species-richness. In general, most of the horse-grazed vegetation would fall within MG6 *Lolium perenne - Cynosurus cristatus* grassland sub-community, which is virtually ubiquitous

in the British lowlands. Areas of somewhat more species-rich vegetation are present, particularly in G4 and here some of the grassland approaches MG5 *Centaurea nigra* - *Cyncsurus cristatus* grassland in character. Grassland which has similarities with MG5 vegetation is also present in M3 and M6, where rabbit-grazing helps to maintain areas of short sward.

6.14 Areas with relatively low grazing pressure have characteristics of MG1 *Arrhenatherum elatius* grassland, which is also ubiquitous. Much of this rank grassland is species-poor, but somewhat more species-rich vegetation has developed locally, particularly in the mosaic areas of M3 and M6, where the vegetation is characteristic of MG1e, the *Centaurea nigra* sub-community.

6.15 Table 9.1.2 shows the number of grassland indicator species recorded from each compartment during the current survey; it therefore represents a minimum and greater survey effort would be likely to add to the figures. In general the grazed pastures at Birchall supports relatively few species considered to be indicators of high quality unimproved neutral grassland; the highest quality grassland areas are found in G4 and parts of G9. Ungrazed areas of grassland in the mosaic compartments generally support a higher number of indicator species, with the grasslands of M3 and M6 being of particular value. Grass vetchling, which is a quite local neutral grassland indicator, has a very large population centred around G4, G5 and M6.

Table 9.1.2 Hertfordshire neutral grassland (NGI) and wet grassland (WGI) Indicator species recorded from the compartments containing semi-improved grassland

Compartment	Number of indicator species
G4	8NGI, 1WGI
G5	5NGI, 1WGI
G6	5NGI
G7	2NGI
G8	3NGI
G9	7NGI, 1WGI
G10	7NGI
M3	10NGI, 2WGI
M4	3NGI
M5	5NGI, 1WGI
M6	10NGI
M7	6NGI, 3WGI
M8	2NGI, 3WGI
M9	3NGI

6.16 Neutral grassland is a Priority Habitat in the Hertfordshire Biodiversity Action Plan. Although the grasslands at Birchall are relatively recent in origin, several areas, particularly G4, M3 and M6 support a diverse flora and could potentially qualify for Local Wildlife Site status under the following criterion: *H2.2.b Grassland site with a predominance of species characteristic of old neutral grassland with 8 or more species recorded from those listed in Appendix 5.*

6.17 Certainly the grasslands at Birchall have the potential to contribute towards the Biodiversity Action Plan target '*To have begun large-scale creation of at least 200 ha of new grassland consisting of locally appropriate species in the three core areas*'.

6.18 **Grassland, improved**

Improved grassland is restricted to one field north of Birchall Farm and is of minimal ecological value.

6.19 **Marshy grassland**

The areas of marshy grassland in M7 and M8 are transitional between MG10b *Holcus lanatus -Juncus effusus* rush-pasture, Juncus inflexus sub-community and OV26c *Epilobium hirsutum* community, *Filipendula ulmaria - Angelica sylvestris* sub-community, which is most clearly present in M8, which was in arable cultivation until fairly recently. The transitional nature of the vegetation is a result of its recent origin; without further disturbance these areas are likely to shift further towards MG10. MG10 grassland is characteristic of permanently moist sites over a wide range of oligotrophic and mesotrophic mineral soils and is very frequent in the UK. The community is not particularly species-rich , but does contain a number of wetland species not recorded elsewhere in the site, including ragged-robin, greater bird's-foot trefoil, square-stalked St John's-wort and green-ribbed sedge. With sympathetic management it may develop a richer flora more characteristic of mire vegetation.

6.20 **Tall herb / ruderal**

The survey area supports a number of very widespread and common communities of disturbed ground. Nutrient-rich soils, particularly in plantation woodlands, and woodland and hedgerow margins, support the OV24 *Urtica dioica - Galium aparine* community. Disturbed areas within the semi-improved grassland and in some of the mosaic habitats support areas of OV25 *Urtica dioica - Cirsium arvense* community, which is highly characteristic of badly managed pasture, waste-ground, waysides and abandoned arable land. Moist but well-aerated soils support areas of OV26 *Epilobium hirsutum* community, which ranges from areas that are virtually monocultures of great willowherb along B40, to more diverse vegetation occurring with marshy grassland in M7 and M8. In general, tall herb communities are of low botanical interest, although many of the species that they support may be important invertebrate nectar sources.

6.21 **Ephemeral / short perennial**

The only significant area- of ephemeral / short perennial vegetation in M8 a is relatively species-rich and support a characteristic arable weed flora with similarities to the OV7 *Veronica persica - Veronica polita* and OV15 *Anagallis arvensis - Veronica persica* communities.

6.22 **Swamp**

Areas of swamp occur around some of the ponds, particularly P11-12 and P14-16, with smaller stands in P5. The dominant NVC type is S12 *Typha latifolia* swamp, which is very frequent around eutrophic lowland lakes and ponds which have a silty substrate. This community is generally very species-poor. There are also smaller areas of S7 *Carex acutiformis* swamp. The species-poor nature and restricted occurrence of these communities means that they are of relatively low ecological value, although they add to the diversity of the overall survey area.

6.23 **Open water, standing, eutrophic and marginal vegetation**

Ponds area a habitat of principal Importance under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. Most of the ponds are located within woodland areas and add to the local habitat diversity, although they are not particularly species-rich botanically. P17-22 are the most important woodland ponds, and support a moderately diverse wetland flora including locally abundant cyperus sedge and greater horsetail.

6.24 P5 is the largest and most interesting pond within the survey area and supports fine-leaved water-dropwort, which is only known from two other sites in Hertfordshire. This pond may qualify for Local Wildlife Site status under Criterion S.1.2: *Sites with 1 or more Hertfordshire Rare species.*

6.25 **Arable land**

Arable field margins are a habitat of principal Importance under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006 albeit they normally only qualify if managed for wildlife benefit. This is not the case at Birchall with the majority of the field margins supporting a small range of very common species.

6.26 Locally the flora is more diverse. On more calcareous soils in the southern part of the site the flora has similarities with the OV15 *Anagallis arvensis - Veronica persica* community and contains species such as such as sharp-leaved fluellen. This community is very characteristic of cereal crops on more basic soils in the warm lowlands of south-east Britain. On more acid, sandy soils there are fragments of vegetation resembling the OV3 *Papaver rhoeas - Viola*

arvensis community, with locally frequent field pansy, cut-leaved crane's-bill and parsley-piert. This community is characteristic of disturbed, light, friable soils in the warm and dry lowlands of Britain.

6.27 Other rather local arable species that are present include bur chervil, which is locally frequent along B3, and a very large population of rye-brome around the margins of A14 and A15. There are also isolated records for cornflower and corn spurrey, but these may have established from areas of wildflower seeding. None of the arable weed communities are particularly species-rich, and rare species are generally quite localised.

6.28 Rye-brome is the most abundant of the rare and local species, and its presence could potentially qualify the field margins of A14 and A15 as a Local Wildlife Site under Criterion S.1.1: *Sites with one or more Critically Endangered, Endangered, Vulnerable or near Threatened Species that are native to the county.* However, rye-brome is undergoing an increase in some parts of the country, and in Hertfordshire records have increased by over 200%, so this designation would seem inappropriate in the absence of any other significant conservation interest.

6.29 **Boundaries, hedges**

Hedgerows are a habitat of principal Importance under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. All of the established hedges have been assessed against the nature conservation criteria of the Hedgerow Regulations 1997 to see whether any qualify as “important” hedgerows (see Appendix 9.1.3).

6.30 The hedgerows themselves support a fairly typical mix of species, characteristic of the W21 community. Several qualify as “important” hedgerows under the Hedgerow Regulations.

- The hedges of B1, which are present either side of Green Lane, are moderately species-rich and support a woodland flora.
- B4 and B6 are associated with a public footpath which crosses the site and are moderately species-rich.
- B17 and B18 run along the north side of Birchall Lane and are likely to be retained during development.
- B21 is a species-rich hedge with some fine old hazel coppice stools which runs to the south of a wet ditch;

- B33 is an ancient hedge with some fine hornbeams and some very large mature hedgerow oak. It is particularly diverse towards its eastern end.

6.31 B9 narrowly misses achieving the criteria for designations as an 'important' hedge, but has some very fine trees and is of higher than average interest.

6.32 **Boundaries, ditches and streams**

The streams present within the survey area are generally either shaded and devoid of vegetation or are dominated by a small number of very common species. They are of limited interest botanically, though they provide habitat diversity.

6.33 **VALUATION SUMMARY**

A summary of the valuation of the various habitats found at Birchall Garden Suburb can be found in Table 9.1.3 below.

Table 9.1.3 Summary assessment of habitat types

Habitat feature	Assessment of value
Woodland, broadleaved, semi-natural	Ranging from Local to County
Woodland, recent broadleaved plantation	Site
Woodland, mixed plantation (part of an AWI site)	County
Veteran trees	County
Scrub	Site Local
Neutral grassland, semi-improved, species-rich	Ranging from local to County
Neutral grassland, semi-improved, species-poor	Local
Improved grassland	Site
Marshy grassland	Local
Tall herb, ruderal	Site to local
Ephemeral / short perennial	Local
Swamp	Local
Open water, standing	Local
Arable	Site
Hedges	Local
Ditches and streams	Local

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Compartment No. **B1**	Grid reference TL 268 124	Habitats Green lane, plantation

Description

A rather complex boundary: there are old hornbeams, seemingly part of a previously laid hedge, along the outer edge of the green lane along the margin of the site. These extend to the limit of housing, where they are replaced by more varied woody vegetation with old trees, mostly ash and oak, but with locally frequent elm, much of which is dying. This part of the boundary supports a woodland flora containing species such as bluebell, dog's mercury, greater stitchwort, wood sedge, wood melick, lords-and-ladies and lesser celandine. Throughout, this side of the green lane is shaded by woody vegetation on the opposite side - a mirroring line of hornbeams in the west, more extensive recent plantation in the east.

Mixed scrub, with blackthorn a prominent component, combines with the old trees and provides a potentially interesting transition on the survey area side, but has been extended and compromised by a band of mixed broadleaved plantation along the field edge, at present still very young and with grassy vegetation beneath. The value of the old trees, and to a lesser but implied extent the old green lane boundary as a whole, can be assumed. There is no obvious reason to expect significant interest in the younger plantation.

No	Photograph	Notes
		New planting along southern edge

Compartment No. **B1**	Grid reference TL 268 124	Habitats Green lane, plantation

Established hedges at the southern end of B1, forming a green lane

Area of dead and dying elm, with more mature plantation outside survey area in background

Compartment No. **B1**	**Grid reference** TL 268 124	**Habitats** Green lane, plantation
Key plant species ***Ancient woodland indicator species*** Bluebell Dog's mercury Field maple Hazel Holly Hornbeam Midland hawthorn Smooth-leaved elm Wild cherry (planted) Wood melick Wood sedge		
Qualifies under Hedgerow Regulations? Both long-established hedges qualify		

Compartment No. **B2**	Grid reference TL 268 119	Habitats Trees, seasonal ditch

Description
An L-shaped seasonal drain leads to a pond (P1), which is also fed by run-off from surrounding arable land, most conspicuously to the east, where a proportion of the flow may be from seepage and flush. There is a slight possibility of relict interest in the wetland fauna of the drain and its grassy fringes, but this seems unlikely. The drain itself probably contains too little water, too irregularly, and to flow in too unsympathetically profiled a channel, to have significant potential. Several old trees lie along the northward-pointing arm of the L and around the pond. These are predominantly oaks but include an impressive field maple, and are assumed to be of significant invertebrate interest. The pond itself (P1) is separately numbered, described and assessed, but might usefully be considered simply one component of this boundary feature.

No	Photograph	Notes
		Veteran hornbeam in B2

Compartment No. **B2**	Grid reference TL 268 119	Habitats Trees, seasonal ditch

Veteran field maple in B2

Key plant species

Ancient woodland indicator species

Field maple

Hornbeam

Compartment No. **B3**	Grid reference TL 270 121	Habitats Scattered trees, ephemeral

Description
A vehicle track, bordered by a weedy transition to arable land on the south side, beyond the end of an area of trees and scrub. This boundary, and the linked B3, provide the most interesting examples of arable-fringe weedy vegetation seen within the survey area, notable especially for an abundance of crane's-bills in very open ground, though it is relatively species-poor and uninteresting in the west. The extent of open weedy habitat is limited, and the quality not obviously very high. The north side is bounded in part by W4 and in part by rough grassland, scrub and several mature to old trees with saproxylic invertebrate potential. The interest of the old trees is assumed; there is little obviously of interest in the remainder.

No	Photograph	Notes
		Mature oaks in B3

Key plant species
Ancient woodland indicator species
Holly
Local species
Bur chervil

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B4**	Grid reference TL 274 121	Habitats Established hedgerow

Description

A hawthorn-dominated hedge, approximately two to three metres tall, generally of unexceptional character but with significant dead wood, locally with good growth of ivy, and including a single oak of limited value. At its western end, close to the junction with Birchall Wood, there is a bank on the southern side where rabbit burrowing has created extensive bare ground amongst otherwise rather coarse grassy vegetation and tall herbs. A footpath along the northern side of the hedge runs through a broad strip of species-poor grassy vegetation with a reasonably well-structured grass/hedge transition. The hedge is of some value, and its close links with Birchall Wood and the green lane of B6, together with the buffering effect of the grassy footpath on its north side, enhance its potential. The bank and the associated bare ground and open-structured vegetation form an interesting feature, but the potential is limited by species-poor vegetation and nutrient-rich soil. The scoping survey identified this as a possible nesting area for solitary aculeates, but in practice no evidence of significant aculeate use was found in visits in either June or August.

Key plant species

Ancient woodland indicator species

Bluebell
Crab apple
Field maple
Holly
Three-veined sandwort

Qualifies under Hedgerow Regulations?

Yes

Compartment No. **B5**	Grid reference TL 274 122	Habitats Established hedgerow
Description Species-poor and structurally poor hawthorn-dominated hedge.		
Key plant species None		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B6**	Grid reference TL 275 121	Habitats Established hedgerows / green lane

Description
A green lane, rather variably developed, including, as well as rather routine hedges, oak and ash trees, the latter including re-grown coppice, bordering rather species-poor coarse grassland and tall herbs, the latter including good quantities of flowering umbelllifers. Though numbers of insects were high, few uncommon species were found. Value was expected to be quite limited, since though there is a useful combination of features none is obviously of individually high quality, but the records probably understate the level of invertebrate interest.

No	Photograph	Notes
		Green lane of B6, with tall ash coppice stools

Key plant species
Neutral grassland indicator species
Common knapweed

Qualifies under Hedgerow Regulations?
Yes

Compartment No. **B7**	**Grid reference** TL 275 125	**Habitats** Established hedge
Description A low hawthorn hedge along the southern boundary of a private property.		
Key plant species Ancient woodland indicator species Field maple		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B8**	Grid reference TL 276 120	Habitats Outgrown hedge
Description The hedge/boundary along Panshanger Lane. Sycamore-dominated at the northern end, and generally structurally poor with frequent stretches of bramble further south. However, towards the northern end there are a number of woodland species in the ground flora.		
Key plant species <u>Ancient woodland indicator species</u> Bluebell Common figwort Crab apple Dog's mercury Field maple Holly		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B9**	Grid reference TL 275 119	Habitats Established hedge

Description
A generally undistinguished low hedge, though old and with moderate amounts of contained dead wood; a small number of trees scattered along the hedge (four ash, two oak) are moderate to large; two ashes towards the northern end of the hedge are especially interesting. The southern end of the hedge is somewhat more interesting, with hornbeam, crab apple and spindle. Part of the northern end has been replanted. The oldest trees must be considered part of the landscape-scale saproxylic habitat, but they occupy only a small part of the hedge. The remainder, though old, is considered of limited invertebrate potential.

Key plant species
Ancient woodland indicator species
Crab apple
Hornbeam

Qualifies under Hedgerow Regulations?
No (although southern end may)

Compartment No. **B10**	Grid reference TL 276 117	Habitats Established hedge
Description A fairly open-structured, fairly low, but old, hedge, dominated by hawthorn, blackthorn and, locally, hornbeam; it contains a considerable amount of dead wood, and the open structure gives good light penetration, but bordering arable land on both sides limits invertebrate potential.		
Key plant species ***Ancient woodland indicator species*** Hornbeam		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B11**	Grid reference TL 274 118	Habitats Established hedge
Description A generally species-poor and structurally poor hedge dominated by blackthorn, with locally frequent crab apple and hornbeam. A single tree along it is an ash of moderate age and size. Of little invertebrate potential.		
Key plant species <u>Ancient woodland indicator species</u> Crab apple Holly Hornbeam		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B12**	Grid reference TL 277 116	Habitats Recent hedge
Description Young hawthorn-dominated hedge bordering the A414, of slight current interest or potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B13**	Grid reference TL 274 116	Habitats Established hedge Plantation

Description
Unexceptional but generally well-established hedge along the north side of Cole Green Lane, backed by a young plantation, still open-structured enough to have a grassy ground flora. The northern section has been replanted with a mix of hawthorn, spindle and field maple. No significant invertebrate interest is expected, and growth of the plantation is likely to remove or severely damage any interest which is present in the near future.

Key plant species
Ancient woodland indicator species
Field maple

Qualifies under Hedgerow Regulations?
No

Compartment No. **B14**	Grid reference TL 273 117	Habitats Scrub
Description Possibly a hedge in the past but now a bank of bramble with hogweed and cow parsley. There are occasional wild rose bushes and patches of elm.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B15**	Grid reference TL 272 119	Habitats Scrub
Description Open-structured blackthorn-dominated hedge with bramble and nettle, of very slight invertebrate potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B16**	Grid reference TL 271 118	Habitats Track and established hedge

Description
A vehicle track, bordered by weedy transitions to arable land on both sides in the north, and on the west side alone in the south, where the eastern side is bounded by a managed blackthorn hedge with old wood. This hedge contains an impressive veteran oak. The track edges, and the linked B3, provide interesting examples of arable-fringe weedy vegetation, notable especially for an abundance of crane's-bills in very open ground. The extent of habitat is, however, limited, and the quality not obviously very high. Sampling of invertebrates in similar vegetation in B3 produced nothing of great interest, and similarly limited value is assumed here.

No	Photograph	Notes
		Veteran oak in B16

Key plant species
Ancient woodland indicator species
Holly

Qualifies under Hedgerow Regulations?
No

Compartment No. **B17**	Grid reference TL 269 116	Habitats Established hedge Plantation

Description
A young, very mixed, plantation fringes an older hedge bordering the north side of Cole Green Lane. The hedge is moderately species-rich, containing several ancient woodland shrubs, and a number of substantial oaks towards its western end. These may be of interest in themselves for invertebrates, but also form part of linking features between ancient woodlands. The trees are tentatively assessed as of high value as part of the wider complex.

No	Photograph	Notes
		Mixed hedge of B17, along north side of Cole Green Lane

Key plant species
Ancient woodland indicator species
Field rose
Hazel
Holly
Hornbeam

Qualifies under Hedgerow Regulations?
Yes

Compartment No. **B18**	Grid reference TL 272 117	Habitats Established hedge

Description
A quite varied hedge, in places very mixed, in part almost pure blackthorn, linked at its western end to a small woodland fragment isolated from Great Captain Wood by Cole Green Lane, and further benefiting from a relatively benign setting: there is a vehicle track to the north and improved grassland to the south, and the hedge is relatively low-lying and sheltered by other features. Despite these benefits, however, the hedge is generally rather undistinguished in intrinsic character. Substantial invertebrate interest is not likely.

Key plant species
Ancient woodland indicator species
Dog's mercury
Hazel
Holly
Hornbeam

Qualifies under Hedgerow Regulations?
Yes (at west and east ends)

Compartment No. **B19**	Grid reference TL 272 116	Habitats Scrub
Description Bramble and scattered scrub along a fence-line bordering Cole Green Lane: of slight invertebrate potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B20**	Grid reference TL 274 115	Habitats Scrub
Description Species-poor grassland fringe, scattered scrub and occasional small trees along the south side of Cole Green Lane; of very limited invertebrate potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B21**	Grid reference TL 275 113	Habitats Drain Established hedge

Description
Narrow drain, rather steep-sided, containing very shallow water at the time of survey and probably seasonal, running in an open channel in the northern part of its course, then alongside a blackthorn-dominated hedge which is old, rather variably structured and species-rich. It has a number of large hazel coppice stools, as well as crab-apple and dogwood, There are a number of oak and ash standards, these being of some potential but neither very old nor very large. Substantial invertebrate interest is not expected, though the trees may make a useful contribution to the old tree resource of the site in the future.

Key plant species
Ancient woodland indicator species
Crab apple
Field maple
Field rose
Hazel

Qualifies under Hedgerow Regulations?
Yes

Compartment No. **B22**	Grid reference TL 274 111	Habitats Ditch Established hedge

Description
A small stream, in a rather steep-sided channel and containing only shallow water at the time of survey, running, in the west, alongside an old hedge containing some mature trees and with significant dead wood, especially of ash; in the east running, briefly, in an open channel with abundant fool's watercress and flote-grass, collecting water from two other very small watercourses, and exiting the survey area through a culvert beneath the A414. The stream was cleaned to a bare channel early in 2014, and plant and invertebrate records are of species which have survived or colonised since.

No	Photograph	Notes
		Hedge
		Open ditch

Compartment No. **B22**	**Grid reference** TL 274 111	**Habitats** Ditch Established hedge
Key plant species <u>Ancient woodland indicator species</u> Crab apple Field maple Pendulous sedge Wood sedge		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B23**	Grid reference TL 276 113	Habitats **Drain**

Description
A narrow, steep-sided drain runs along the lower (western) margin of W8, between an arable field and banked tall grass and herbs leading up to the A414, then, in a rather deep and steep-sided channel, along a break of slope between two formerly cultivated areas which collectively constitute M8 in this survey, before joining a second, slightly more substantial, stream, and exiting the site through a culvert. This is a rather minor feature, but the continuously damp bed with scattered pools, deepening only slightly towards its distal end, suggests that much of the water may arrive by seepage from higher ground to the north, a view perhaps supported by an abundance of great horsetail on the north bank. No separate records have been made for this boundary feature because, in the most significant part of its course, it could not be separated, in sampling, from the adjoining parts of M8.

Key plant species
Wet grassland indicator species
Wild angelica
Meadowsweet

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B24**	Grid reference TL 276 111	Habitats Recent hedge

Description
Undistinguished young hedge with a mix of blackthorn, hawthorn, dog rose, dogwood and hazel, bordering the A414, somewhat enhanced adjacent to M8 by following a track and bordered by sheltered, west-facing, rabbit-disturbed open-structured ruderal vegetation.

No	Photograph	Notes
		

Key plant species
Ancient woodland indicator species
Field maple (planted)
Hazel (planted)

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B25**	**Grid reference** TL 273 104	**Habitats** Recent hedge
Description Laid hedge with standard shrubs and young trees; interestingly structured and perhaps with long-term invertebrate potential, but young and unexceptional at present.		
Key plant species Ancient woodland indicator species Field maple (planted)		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B26**	Grid reference TL 268103	Habitats Recent hedge
Description Young and unexceptional mixed hedge with equally young trees, along the boundary with the A414; of very limited invertebrate potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B27**	Grid reference TL 271 106	Habitats Plantation

Description
Shelterbelt plantation with substantial but young trees, especially poplars, over nutrient-rich ground and uninteresting, mostly nettle-dominated flora; part is along a drain-line, but this is insufficiently damp to enhance interest or potential; structure is locally diversified by rabbit [redacted] several fallen grey/white poplars are the most interesting feature for invertebrates, and have some limited potential.

No	Photograph	Notes
		View across G8 to B27

Key plant species
Ancient woodland indicator species
Field maple (planted)
Wild cherry (planted)

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B28**	Grid reference TL 270 107	Habitats Rank grassland
Description Fence and rough grassland.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B29**	Grid reference TL 268 107	Habitats Tall ruderal Scrub

Description
A scattering of trees and shrubs where this boundary borders G8 is quite well-structured and varied, though any suggestion of interest comes largely from its association with this area of relatively interesting grassland. Much of the boundary is dominated by ruderal tall herbs.

No	Photograph	Notes
		

Key plant species
None

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B30**	Grid reference TL 266 106	Habitats Plantation
Description A line of tall black poplars. These are of slight current invertebrate interest, but poplars can support an interesting invertebrate assemblage, especially when they develop significant dead wood.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B31**	Grid reference TL 264 103	Habitats Recent hedge
Description A short (1.5-2m) species-poor hedge, dominated by hawthorn and cherry-plum, of limited invertebrate potential.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B32**	Grid reference TL 264 103	Habitats Recent hedge
Description A tall species-poor hedge, dominated by hawthorn, of limited invertebrate potential.		
Key plant species ***Neutral grassland indicator species*** Common knapweed		
Qualifies under Hedgerow Regulations? No		

Compartment No. **B33**	Grid reference TL 263 104	Habitats Established hedge

Description
Old hedge-line with substantial old trees, following, as delineated for the scoping survey, a rather irregular route. The easternmost section, running roughly north-south, includes old hornbeams beside a largely dry drain; the part to the west, following a somewhat zig-zag course, contains two old pollard ash, four large old oaks, old hornbeam coppice, and blackthorn and hawthorn with good structure and, in places, substantial dead wood.

No	Photograph	Notes
		

Key plant species
Ancient woodland indicator species
Crab apple
Field maple
Hazel
Hornbeam

Qualifies under Hedgerow Regulations?
Yes

Compartment No. **B34**	Grid reference TL 264 108	Habitats Recent hedge
Description A fairly young tall hedge, hawthorn-dominated, becoming more varied in the north where it borders M4; quite well-structured but unexceptional.		
Key plant species ***England Near Threatened species*** Field scabious ***Ancient woodland indicator species*** Wild cherry		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B35**	Grid reference TL 265 108	Habitats Plantation

Description
Young shelterbelt, of mixed composition, still fairly open-structured and with well-developed grassland beneath; some of the planted trees are dead or moribund, adding to the open character and invertebrate potential, but any interest may be both limited and transitory, as the woody vegetation grows and shades the herbaceous vegetation.

No	Photograph	Notes
		

Key plant species
None

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B36**	Grid reference TL 265 111	Habitats Recent hedge
Description Poorly-structured recently planted hedge dominated by blackthorn and hawthorn with a few young poplar trees.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B37**	Grid reference TL 267 112	Habitats Scrub
Description Mixed scrub and recently planted young trees in species-poor grassland; considerable flowering blackthorn a notable feature.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B38**	Grid reference TL 267 111	Habitats Plantation Scrub Rank grassland

Description
A track bordered by generally fairly coarse and species-poor grassland, and with varying amounts of woody vegetation. In the north, there is merely scattered scrub along fenced boundaries; in the south, there is well-developed scrub and some trees, notably including some substantial poplars. Any invertebrate interest is likely to be concentrated in the better-treed areas, where there are areas of good vegetation structure, but potential is limited.

No	Photograph	Notes
		

Key plant species
None

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B39**	Grid reference TL 270 110	Habitats Scrub
Description Scattered scrub along a fenced boundary.		
Key plant species None		
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B40**	Grid reference TL 258 106	Habitats Established hedge Wood edge

Description
A mixed hedge, of variable height, backed for most of its length in the west by woodland beyond the site boundary, and containing well-grown trees with overhanging foliage above a nettle- and great willowherb-dominated fringe of tall grass and herbs. This fringe is narrower along the northern arm, within which there are scattered mature to old oaks with substantial dead wood in the crowns. The old trees are, in accordance with the general policy adopted here, assumed to be of high value; the remainder of the hedge, though probably not without some interest at the local level, and of use if providing contextual habitat for the oaks, is not considered of significant interest, and in the most structurally complex area is limited by shade and aspect.

No	Photograph	Notes
		Stag-headed oaks at north end of B40

Key plant species
Ancient woodland indicator species
Hairy-brome
Hazel
Hornbeam
Smooth-leaved elm
Wych elm

Qualifies under Hedgerow Regulations?
No

Compartment No. **B41**	Grid reference TL 261 111	Habitats Established hedge

Description
A mature hedge dominated by blackthorn and hawthorn, with frequent ash and one sizeable oak, adjacent to a dry ditch. Willows are locally frequent at the northern end. Of rather limited intrinsic potential for invertebrates.

No	Photograph	Notes
		Northern end of B41

Key plant species
Ancient woodland indicator species
Field maple
Hairy-brome

Qualifies under Hedgerow Regulations?
No

Compartment No. **B42**	Grid reference TL 263 115	Habitats Scrub Wood edge

Description
This boundary backs onto a lane fringed by scrub and mature trees, including hornbeam, ash and oak, and containing a significant amount of dead wood. The trees overhang the fence which marks the field boundary, and scrub has spread within it, forming a well-structured transition with, at the time of survey, abundant blackthorn flowers. The parts within the survey area form only a part of this broader strip of habitat along the lane, and must be considered potentially valuable in that respect: a higher value reflecting its context might be justified.

No	Photograph	Notes
		

Key plant species
Ancient woodland indicator species
Crab apple
Field maple
Hazel
Hornbeam
Wych elm

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No. **B43**	Grid reference TL 260 111	Habitats Wood edge

Description
The margin of a wood mostly beyond the site boundary, noteworthy for substantial hazels, overhanging tree canopies, a significant amount of dead wood including a partially hollow oak, and a variably developed tall herb fringe. Of some potential, but assessment should ideally be in conjunction with that of the rest of the woodland, which was not surveyed.

No	Photograph	Notes
		
		

Key plant species
Ancient woodland indicator species
Field maple
Hazel
Holly
Hornbeam

Compartment No. **B43**	**Grid reference** TL 260 111	**Habitats** Wood edge
Qualifies under Hedgerow Regulations? Not applicable		

Compartment No. **B44**	Grid reference TL 260 109	Habitats Established / recent hedgerow

Description
An unexceptional and rather ill-kempt hedge dominated by hawthorn, elder, field maple, bramble, rose, fronted by a strip of coarse grassland one to two metres in width. Although there is a scatter of old elder bushes, the majority of the shrubs have been recently planted and include ancient woodland species such as hazel and hornbeam.

No	Photograph	Notes
		

Key plant species
Ancient woodland indicator species
Field maple (planted)
Crab apple
Hazel (planted)
Hornbeam (planted)
Wild cherry (planted)

Qualifies under Hedgerow Regulations?
Not applicable

Compartment No.	Grid reference	Habitats
G4	TL 264 114	Neutral grassland, semi-improved

Description

The northern part of this field is the most floristically diverse and potentially interesting of the areas of grassland on landfill visited. There are good populations of some important invertebrate foodplants, including meadow vetchling, ox-eye daisy, wild carrot, hoary ragwort, bird's-foot-trefoil and self-heal. There is also a very large population of grass vetchling. There are areas of taller grass and herbs, where there are nectar flowers such as ragwort and thistles. There is scattered scrub, though younger examples appear to be in retreat in the face of horse-grazing, and a well -structured transition on the west side (B42). Its southern area is distinguished by an substantial area of rather soft, damp grassland and by low dry mounds, kept open by horse trampling.

No	Photograph	Notes
		The northern part of the field in June, with abundant ox-eye daisy, meadow buttercup and grass vetchling.
		The scrubby transition between G4 and B42.

Compartment No. **G4**	Grid reference TL 264 114	Habitats Neutral grassland, semi-improved

The northern part of the field in August, with abundant flowering wild carrot.

Key plant species

Neutral grassland indicator species

Agrimony
Bird's-foot-trefoil
Grass vetchling
Meadow barley
Meadow buttercup
Meadow vetchling
Ox-eye daisy
Red clover

Wet grassland indicators

Fleabane

Compartment No.	Grid reference	Habitats
G5	TL 266 113	Neutral grassland, semi-improved

Description
The majority of this field supports rather dense, rank, species-poor grassland, dominated by a mix of common bent, red fescue, meadow fescue, tall fescue, creeping bent and smooth meadow-grass with frequent to abundant white clover, creeping buttercup and creeping cinquefoil. Locally it is somewhat more varied, especially near the boundary with M5, and has frequent wild carrot and occasional grass vetchling.

No	Photograph	Notes
		The southern end of G5 is to the left of the cycleway.

Key plant species
<u>Neutral grassland indicator species</u>
Common Bent
Crested dog's-tail
Grass vetchling
Meadow barley
Meadow fescue
Ox-eye daisy
<u>Wet grassland indicators</u>
Marsh foxtail

Compartment No. **G6**	Grid reference TL 268 111	Habitats Neutral grassland, semi-improved

Description
Generally rather species-poor horse-grazed grassland on landfill, dominated by Yorkshire fog, with false oat-grass, cock's-foot, tall fescue, rough meadow grass and creeping bent, with good populations of some important invertebrate foodplants, especially cut-leaved crane's-bill and nectar flowers such as hoary ragwort and thistles.

No	Photograph	Notes
		View east across G6 at the highest point, showing rank, species-poor grassland.

Key plant species
<u>Neutral grassland indicator species</u>
Crested dog's-tail
Meadow barley
Meadow buttercup
Meadow vetchling
Red clover

Compartment No. **G7**	Grid reference TL 272 108	Habitats Neutral grassland, semi-improved
Description Heavily horse-grazed grassland on landfill, generally species-poor and dominated by perennial rye, with locally frequent false oat-grass, Yorkshire fog, soft brome and lesser cat's-tail but with greater diversity locally, with tall herbs such as common ragwort, teasel and thistles, and occasional damper areas and transitions to scrub. Invertebrate potential appears limited and is almost certainly of only local value.		
Key plant species Neutral grassland indicator species Common bent Bird's-foot-trefoil		

Compartment No. **G8**	Grid reference TL 272 106	Habitats Neutral grassland, semi-improved

Description

One of the more interesting areas of grassland in the survey area, though areas of relatively high potential are somewhat patchily distributed across it. The grassland is horse-grazed and on landfill, and its basic characteristics and composition are similar to those seen in other grass fields, and not especially species-rich, but with good populations of some important invertebrate food plants. It is made more interesting by "humps and hollows" topography, which has produced seasonal pools and small areas of open-structured, seasonally parched vegetation. Linear open-structured mounds across approximately the narrowest point of this field have a rather different range of plants and further potential. In 2014, many of the pools may have been too transitory for substantial interest, but some were longer-lasting. The combination of wet and dry conditions in close proximity is potentially valuable even if the possibilities for aquatic species are limited.

No	Photograph	Notes
		Temporary pool in March 2014, with a small population of pond water-crowfoot.

Compartment No. **G8**	Grid reference TL 272 106	Habitats Neutral grassland, semi-improved

Closely horse-grazed summer-parched mound with ephemeral species such as common whitlowgrass, wall speedwell, sticky mouse-ear and thyme-leaved sandwort.

General view (south) in August 2014, showing hummocky terrain and generally rather species-poor semi-improved grassland, variably grazed.

Compartment No. **G8**	Grid reference TL 272 106	Habitats Neutral grassland, semi-improved

General view (north) in August 2014, showing hummocky terrain and generally rather species-poor semi-improved grassland, variably grazed and with large patches of common nettle.

Key plant species
Neutral grassland indicator species
Bird's-foot-trefoil
Common bent
Lady's bedstraw

Compartment No. **G9**	Grid reference TL 265 108	Habitats Neutral grassland, semi-improved

Description

Generally rather species-poor horse-grazed grassland on landfill, but quite well-grazed, with good populations of some important invertebrate foodplants, especially geraniums, and nectar flowers such as ragwort and thistles. Enhanced by varied topography, which has led to the development of small seasonal pools: all were dry at the time of survey, and none showed significant development of wetland flora, and so are probably too ephemeral for significant invertebrate interest at present.

No	Photograph	Notes
		The northern part of the field in June 2014, showing typical grassland with abundant creeping buttercup.
		View across to M4, showing slope and rather hummocky terrain.

Compartment No. **G9**	Grid reference TL 265 108	Habitats Neutral grassland, semi-improved

Relatively species-poor grassland towards the southern end of the field, with abundant white clover and populations of hoary ragwort and teasel.

Differences in structure in response to variable horse grazing pressure either side of a fence.

Compartment No. **G9**	Grid reference TL 265 108	Habitats Neutral grassland, semi-improved

Key plant species

Neutral grassland indicator species

Bird's-foot-trefoil
Common bent
Common knapweed
Crested dog's-tail
Meadow barley
Ox-eye daisy
Red clover

Wet grassland indicator species

Marsh foxtail

Compartment No.	Grid reference	Habitats
G10	TL 266 110	Neutral grassland, semi-improved

Description

Generally rather species-poor horse-grazed grassland on landfill, dominated by common bent, red fescue, crested dog's-tail, Yorkshire fog and smooth meadow-grass with frequent white clover, but quite well-grazed, with good populations of some important invertebrate food plants, especially geraniums, nectar flowers such as ragwort and thistles, and locally with large quantities of flowering wild carrot. A number of neutral grassland indicators are locally frequent including grass vetchling, ox-eye daisy and meadow barley.

No	Photograph	Notes
		Flowering wild carrot in August 2014.
		The southern end of the field in October 2014 showing localised poaching and areas of species-poor sward.

Compartment No. **G10**	**Grid reference** TL 266 110	**Habitats** Neutral grassland, semi-improved
Key plant species Neutral grassland indicator species Common bent Crested dog's-tail Grass vetchling Meadow barley Meadow buttercup Ox-eye daisy Red clover		

Compartment No. **P1**	Grid reference TL 268 120	Habitats Pond

Description

A nutrient-enriched pond oval about 30 metres by 20 metres, fed by a narrow intermittent drain and run-off from arable land; the pond itself is moderately shaded, eutrophic and uninteresting, the willow scrub which partly fringes and shades possibly has slightly more wildlife value. The pond was dry at the time of survey. Much of its area was dominated by a mix of herbaceous species including abundant cleavers, silverweed, curled dock and common nettle. The dampest areas had abundant creeping jenny and locally frequent marsh bedstraw, and bladder sedge is locally abundant.

The pond is surrounded by four mature oak trees and one large ash, and has dense scrub of grey willow, blackthorn, common hawthorn, elder and dogwood. More open areas around the pond have tall ruderal vegetation dominated by common nettle, broad-leaved dock, creeping buttercup and rough meadow-grass.

Key plant species

England Red List Vulnerable

Bladder sedge

Compartment No.	Grid reference	Habitats
P2	TL 265 119	Pond

Description
A fairly large, shaded pond, with little wetland vegetation and little indication of interest. There is a dead tree on the west side and tall oak and hornbeam on the eastern and southern boundaries. No aquatic vegetation was visible at the time of survey, but the margins have clumps of yellow iris, and more scattered stands of soft rush, woody nightshade and remote sedge.
This pond included in a general assessment of assumed high invertebrate quality for W2, within which it is situated. Its intrinsic potential for invertebrates is slight.

No	Photograph	Notes
		View in a north-easterly direction of P2 showing shaded aspect, with recent management on the west side (May 2011).

Key plant species
None

Compartment No.	Grid reference	Habitats
P3	TL 266 117	Pond

Description

A fairly large, moderately shaded pond, with beds of yellow iris, branched bur-reed and soft rush. In spring 2014 it contained extensive open water but by October 2014 the water was covered with a dense layer of least duckweed. It possesses somewhat higher invertebrate potential than most of the heavily shaded woodland ponds in the survey area, but remains of very limited interest. This pond is effectively included in a general assessment of assumed high quality for W2, within which it is situated. Independently assessed, it is very slight invertebrate interest.

No	Photograph	Notes
		View in a westerly direction of P3 in May 2011 showing shaded surroundings, rather turbid water and clumps of yellow iris around the margins.
		In October 2014 the surface of P3 was largely covered with least duckweed. The marginal vegetation remains dominated by yellow iris.

Key plant species

None

Compartment No. **P4**	Grid reference TL 268 116	Habitats Pond

Description
A very shallow, unshaded pond, in damp grassland dominated by creeping bent and creeping buttercup, at the fringe of a plantation along a field boundary, but spreading, in March 2014, into a substantial area of shallow flooding over the edge of an arable field. A number of planted trees close to the pond, especially on its northern side, have died, but nonetheless live plantings extend close to much of the margin and will soon cast sufficient shade to compromise any aquatic interest, especially as the trees will be predominantly on the southern side.

The potential of the pond is probably limited: extensive algal growth, and the adjoining arable field, suggest nutrient enrichment. At the time of survey, however, structure was quite reasonable, with flooded grassy margins and some fringing willow scrub. It supports a variety of marginal and wetland species including frequent reed sweet-grass , floating sweet –grass, woody nightshade and water plantain. There is clearly substantial fluctuation in water level; complete or extensive summer drying enhances its potential.

No	Photograph	Notes
		View of P4 in May 2011, a shallow, open field pond with much algal growth and a range of emergent species.
		View of P4 in March 2014 showing flooding of adjacent arable field.

Key plant species
None

Compartment No. **P5**	Grid reference TL 272 118	Habitats Pond

Description

A narrow sinuous pond some 80 metres or more in length, with rather steep banks, set in a mix of tall ruderals, grassland, scrub, and scattered trees, including dead standing timber, and partly and variably fringed by willows. The water is generally shallow, or at least has extensive marginal shallows, and supports well-developed emergent vegetation.

It is very heavily vegetated at the north-east end with beds of branched bur-reed and yellow iris, and with frequent soft rush, woody nightshade and great willowherb. To the south and west there is dense willow scrub on the margins, and beds of sedge, bulrush and flowering rush. Two mature trees, an oak and an ash, are present on either side of a marked kink, and to the south of this there is shallow open-structured vegetation with abundant gipsywort and occasional celery-leaved buttercup, fine-leaved water-dropwort and water-cress.

Marginal structure is far from ideal, with a sudden edge, considerable shade from woody vegetation, and tall ruderals around the more open margins sufficient to shade the marginal fringe in summer. Considerable growth of filamentous alga within the water, and tall ruderal vegetation with common nettle, hogweed and great willowherb on the more disturbed areas of bank, suggest nutrient-enrichment. The drier upper fringe of the surrounds include two substantial oaks, a standing dead oak stump, and the cut remains of a substantial dead oak. Expectations from this pond are not high, but its structure is reasonable, and if, as might reasonably be expected, the pond was of higher quality in the past, it may have relic interest which has so far survived its decline. The old oaks, at least those with significant dead wood, should be regarded as part of the general resource of old trees for saproxylic fauna in the long-term.

No	Photograph	Notes
		View in a southerly direction of P5 showing beds of mixed emergent vegetation, including sedges and branched bur-reed. There are two fine dead trees and scattered willow scrub around the margins.

Compartment No. **P5**	Grid reference TL 272 118	Habitats Pond
Key plant species ***Hertfordshire RDB species*** Fine-leaved water-dropwort ***Local species*** Flowering rush		

Compartment No. **P6**	Grid reference TL 263 119	Habitats Pond

Description

Mapped as a small pond close to the boundary of W3; in practice there was much more extensive flooding in the wood, part clearly seasonal and with emergent trees, part seemingly in treeless hollows with seemingly more prolonged flooding. All the water seen was shaded and uninteresting, with no real hint of wetland vegetation, and very slight potential for invertebrates.

No	Photograph	Notes
		Extensive flooding in W3, close to the location of P6.

Key plant species

None

Compartment No. **P9**	Grid reference TL 269 112	Habitats Pond

Description
A substantial and extensively shaded pool in woodland, fringed by tall willows and other trees and shrubs and with a bed dominated by dead leaves; extensive growth of New Zealand pigmyweed forms both submerged and marginal beds in the better-lit areas. The water was very clear. Brief sampling in the best-structured areas produced, surprisingly, almost no invertebrates, and was discontinued. High invertebrate interest is not expected, but there is a slight possibility of uncommon species.

No	Photograph	Notes
		View of P9 showing fallen willow and extensive beds of New Zealand pigmyweed in very clear water.

Key plant species
None

Compartment No. **P10**	Grid reference TL 263 113	Habitats Pond

Description

A fishing lake, its edges generally abrupt and often boarded, with aquatic and emergent vegetation very localised, and with some stretches of margin shaded by woody vegetation. No aquatic macrophytes were recorded, but the marginal species include frequent gipsywort and yellow iris. Sweet flag is locally frequent. Wetland vegetation on the fringes is patchy and dominated by hard rush and great willowherb, with locally frequent fleabane.

The lake is diversified and made more interesting for invertebrates by fallen woody vegetation in the water, submerged fine root growth of willows, and seasonally exposed gravelly sediments, though the latter are too heavily trampled to develop substantial interest. There is limited potential for invertebrates, but the water was, in summer, generally clear and the recorded fauna, though not of great interest, was of reasonably quality. Surrounding vegetation, including shading willows, is considered under M5.

No	Photograph	Notes
		View of P10 showing willow fringed margins and boarded edges with sparse aquatic or emergent vegetation.

Key plant species

None

Compartment No. **P12 & 13**	**Grid reference** TL 262 109	**Habitats** Pond

Description

Though these are two separate water bodies, they are sufficiently close and sufficiently similar that they may be considered under a single heading. Both are formed by the broadening of a stream, and the considerable sediment brought down by that stream, and deposited on the emergent vegetation, may be a limiting factor on the fauna. Rather dense emergents of lesser pond-sedge and bulrush fringe both ponds, with sedge more a feature of the lower pond (P11). The emergents and marginal fringe merge into tall ruderals and willow scrub, giving very poorly structured, shaded, margins. The narrow point between the two ponds has been used as a vehicle route and had deepened into a sheer-sided trench in spring, much silted in summer, which offers, at its fringes, a little variation in structure. Expectations of the aquatic and wetland fauna are low, but these are two of the better-vegetated and more substantial ponds on the site.

Key plant species

None

Compartment No. **P14, P15, P16**	Grid reference TL 266 105	Habitats Swamp / ponds
Description These are three separately numbered ponds, but they effectively form a single bulrush swamp with water of variable depth, with little variation in character, and of unpromising appearance. Wetland and marginal vegetation, and the predominantly arable surroundings, suggest nutrient-enrichment, and expectations for invertebrates are not high, but reasonably-sized swamps are rarely devoid of interest and substantial swamps of bulrush are, considering the reputation of the species as a damaging invasive, surprisingly infrequent.		
Key plant species None		

Compartment No. **P17-P22**	Grid reference TL 273 111	Habitats Ponds / swamp

Description

This closely-spaced series of shaded small ponds is considered as a single unit: though they are varied in character, from shaded leaf-filled shallow pools almost devoid of wetland vegetation, to shallow vegetated swamp with remote sedge, cyperus sedge, woody nightshade, water-cress, gipsywort and great willowherb, to bulrush swamp and a shallow pool filled with yellow iris, they are in similar settings, are linked by a seasonal or intermittent flow, and are contained within W10. Their character is dependent on their woodland surroundings, and they can strictly be assessed only in combination with W10, but for current purposes the wetland and woodland components are separated. Water flows into the wetland here from M7, and this too should ideally be considered as part of the same habitat unit for assessment, and certainly for any future management.

No	Photograph	Notes
		Shallow leaf-filled pool with no vegetation
		Pool filled with cyperus sedge in March 2014

Compartment No. **P17-P22**	Grid reference TL 273 111	Habitats Ponds / swamp

Pool filled with Cyperus sedge and gipsywort in October 2014

Pool dominated by yellow iris

Margin of pools with abundant great horsetail

Compartment No. **P17-P22**	**Grid reference** TL 273 111	**Habitats** Ponds / swamp
Key plant species <u>Local species</u> Cyperus sedge Great horsetail		

Compartment No. **P23**	Grid reference TL 274 111	Habitats Pond
Description A small, heavily shaded pond amongst scrub, devoid of aquatic and wetland vegetation and with no characteristics suggestive of invertebrate interest.		
Key plant species None		

Compartment No.	Grid reference	Habitats
P24	TL 273 110	Pond

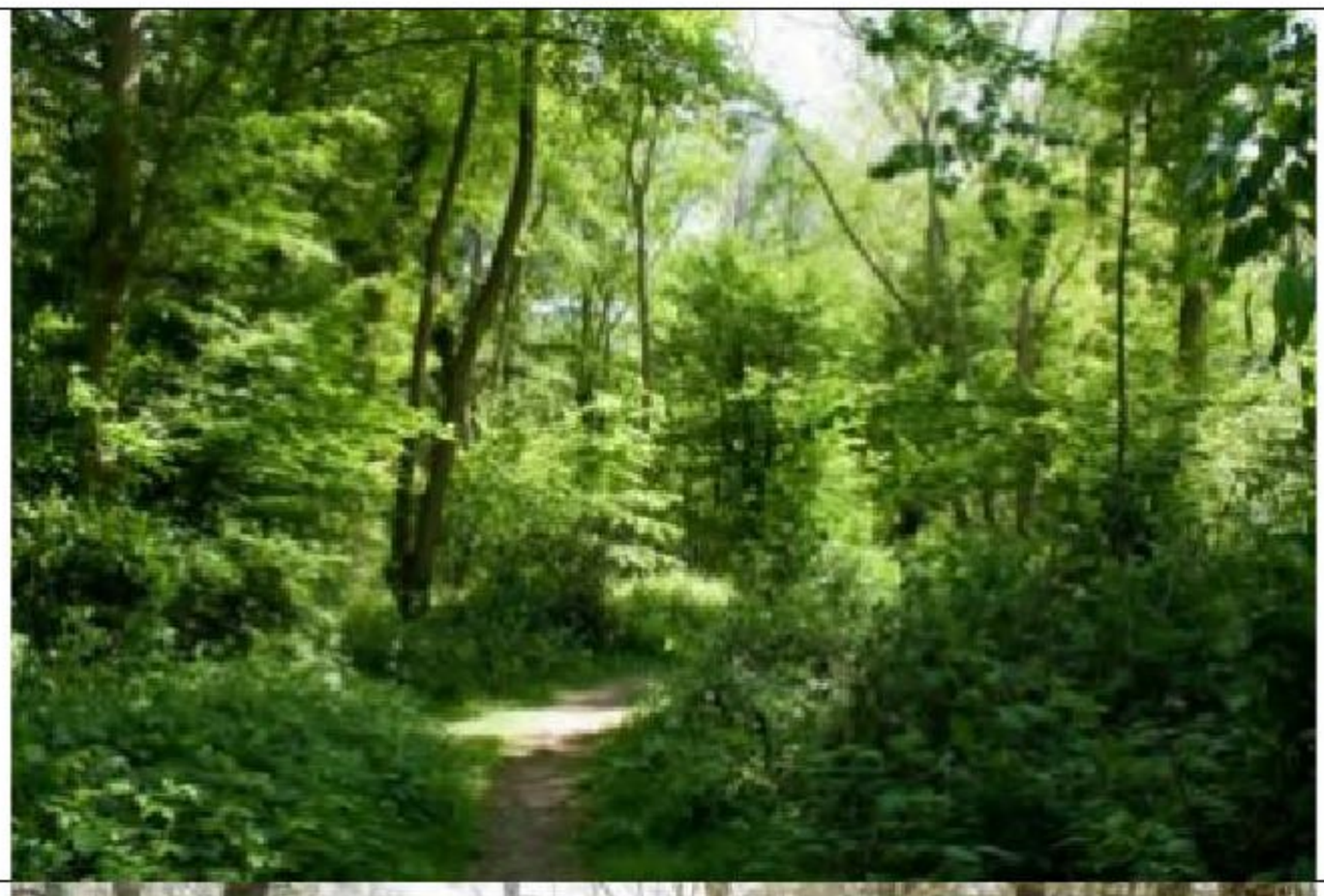
Description
A substantial basin, but largely leaf-filled, shaded, and with little free water at the time of survey; perhaps prone to considerable transient fluctuations in water level. Vegetation is rather patchy, though it includes a moderate range of common wetland plants including celery-leaved buttercup, creeping buttercup, bulrush and water figwort. This pond is contained within W10, but it is offset from the other ponds within this linear area and does not have the benefit of water flow, which vastly reduces its potential.

No	Photograph	Notes
		P24 was dry in October 2014, the vegetation dominated by creeping buttercup with a small stand of bulrush and occasional water figwort

Key plant species
None

Compartment No. **W1 Rolls Wood**	Grid reference TL 263 121	Habitats Ancient woodland

Description
An ancient woodland, mostly dominated by closed canopy pedunculate oak and hornbeam in the east, with increasing amounts of ash to the west. The shrub layer is variable, being absent in some areas, and dominated by young hornbeam and holly in others. The ground flora is dominated by dense bramble, but with areas of bare ground under dense stands of hornbeam, and grass-fringed paths which support a somewhat more diverse flora including remote sedge, wood sedge, wavy bittercress, wood avens and good amounts of wood speedwell. Dead wood is not abundant, but includes some sizeable logs and recently fallen trees, and old coppice stools and stumps in the west. There are some leaf-filled seasonal pools, and a more extensive, quite well-vegetated wetland with beds of rushes and sedge and a drainage outlet towards the south-west side.

No	Photograph	Notes
		The northwest corner of Rolls Wood (W1) showing the generally dense and shaded character of the hornbeam woodland, with abundant bramble along the path.
		Hornbeam canopy over a seasonal pool surrounded by areas of remote sedge. This pool contained frogspawn in March.

Compartment No. **W1 Rolls Wood**	Grid reference TL 263 121	Habitats Ancient woodland

Hornbeam-dominated area of woodland, showing predominantly bare woodland floor and a mix of coppice and maiden trees.

Key plant species

Ancient woodland indicators

Bluebell*
Broad buckler-fern
Bugle
Common dog-violet
Common figwort
Early dog-violet
Enchanter's nightshade
Field maple
Field rose
Hairy brome
Hazel
Holly Hornbeam
Midland hawthorn
Pendulous sedge
Remote sedge*
Three-veined sandwort
Wavy bitter-cress
Wild cherry
Wild daffodil
Wood meadow-grass*
Wood millet
Wood sedge
Wood speedwell
Wych elm

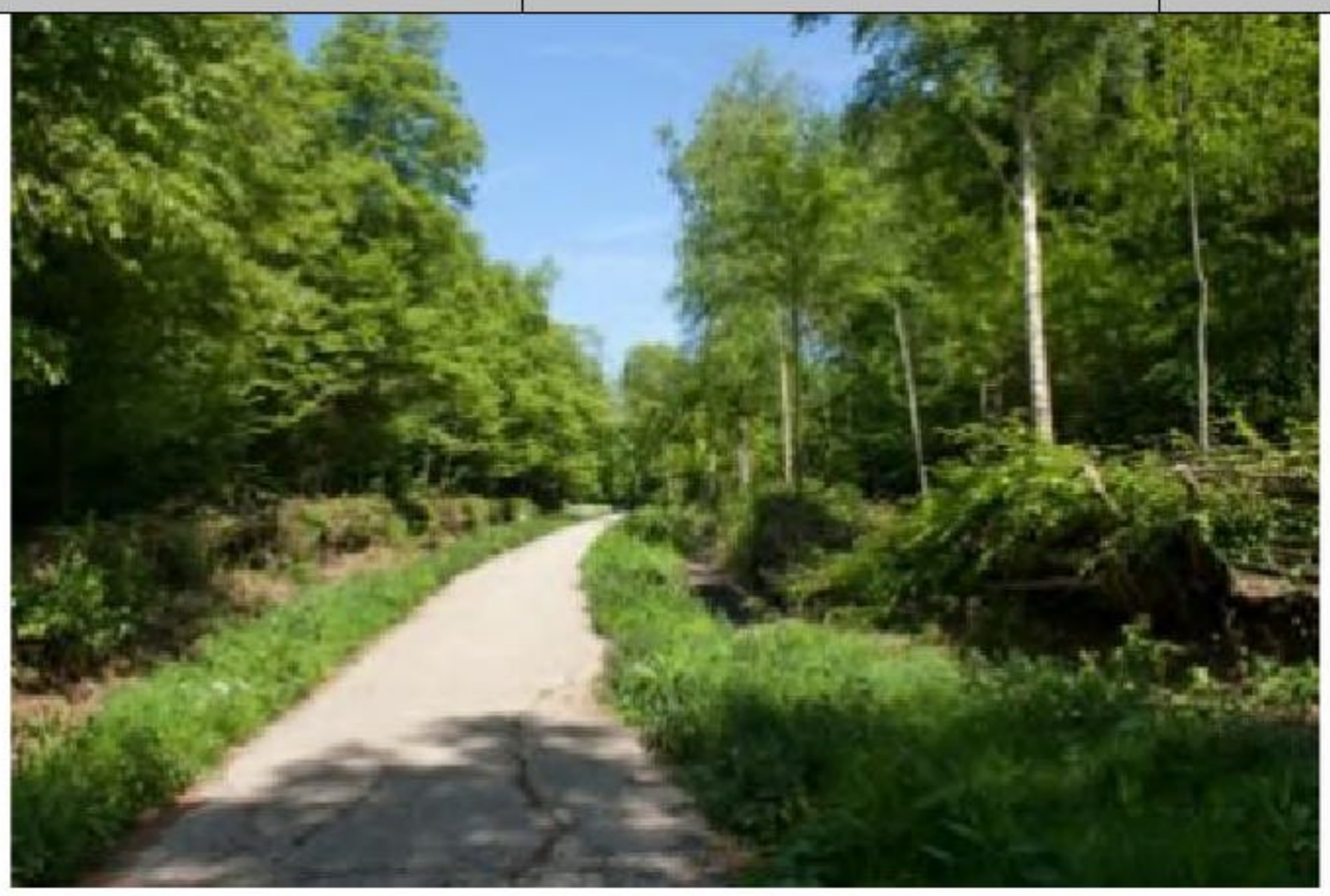
Compartment No. **W2 Blackthorn Wood**	Grid reference TL 265 118	Habitats Ancient, semi-natural woodland with planting

Description

Mixed broadleaved woodland, probably ancient but with areas of recent planting. Over most of its area there is a scatter of tall mature oaks and ashes over much younger growth, including birch, ash and hornbeam, with local hornbeam pollards. Structure is better and potential greater in the east, where the wood narrows beyond a pond; here there is no tree planting and little young growth, and there are old oaks, hornbeams and ashes with considerable standing and fallen dead wood. There are some particularly fine hornbeam coppice stools on the eastern boundary, and some hornbeams along the margins of the green lane have recently been laid. The woodland is in places impenetrable, and has a ground flora dominated by bramble and common nettle interspersed with areas of bare ground. More open conditions along a circular path supports a somewhat richer flora with a number of woodland species including frequent wood sedge, wood millet and wood speedwell.

No	Photograph	Notes
		The north-west corner of W2 showing bat hibernaculum and mound with locally frequent greater stitchwort, sweet violet and small-leaved elm.
		View of the north-east corner of W2 showing grassy path with frequent cow parsley and common nettle, and very dense woodland to either side.

Compartment No. **W2 Blackthorn Wood**	**Grid reference** TL 265 118	**Habitats** Ancient, semi-natural woodland with planting



View of the metalled track running between W1 (left) and W2 (right). Hornbeams have recently been laid, and there is a damp ditch along much of the edge of W2.

The south-east part of W2, with rather dense long-established hornbeam coppice over a bramble-dominated ground flora. Young silver birch can also be seen.

Key plant species

Ancient woodland indicators

Bluebell
Bugle
Common dog-violet
Common figwort
Field maple
Field rose
Hazel
Holly
Hornbeam
Midland hawthorn
Pendulous sedge
Remote sedge
Sessile oak (planted)
Small-leaved elm

Compartment No. **W2 Blackthorn Wood**	**Grid reference** TL 265 118	**Habitats** Ancient, semi-natural woodland with planting
Wild cherry Wood millet Wood sedge Wood speedwell		

Compartment No. **W3**	Grid reference TL 263 119	Habitats Semi-natural broadleaved woodland

Description

A rather unexceptional area of hornbeam dominated woodland, including some grown-out coppice, young maiden trees and saplings. Other woody species include oak, ash, field maple, and hawthorn. Older coppice stools seem to be particularly associated with former boundaries. The ground flora is variously dominated by ivy, bramble and rough meadow-grass with abundant wood avens, herb Robert, ground ivy and lords-and-ladies. Ancient woodland species are sparse, but include remote sedge and wood millet. Cow parsley, which provides a good nectar source, is locally abundant in more open areas.

The floor of the woodland is very irregular in the west, more level in the east; the very local and patchy distribution of ground flora suggests either deteriorated ancient woodland or colonising secondary woodland. There are some old trees, though none are exceptional, and a moderate amount of dead wood; some of the older trees appear open-grown, suggesting more park-like conditions in the past; a decline from open conditions to closed woodland would explain much of the generally rather poor appearance of the woodland.

At the time of survey there was an extensive flooded area in the north-west, part of which was of considerable duration, suggesting a recent change in the drainage, since the map of the wood shows only a small pond towards the eastern end of the larger western portion.

No	Photograph	Notes
		The north-west part of W3, showing extensive flooding in March, which persisted for much of the year.

Key plant species

Ancient woodland indicators

Common dog-violet
Dog's mercury
Field maple
Field rose
Holly
Hornbeam

Compartment No. **W3**	**Grid reference** TL 263 119	**Habitats** Semi-natural broadleaved woodland
Remote sedge Wood millet Wood speedwell		

Compartment No. **W4 – Howick's Wood**	**Grid reference** TL 264 117	**Habitats** Plantation / semi-natural broadleaved woodland

Description
Plantation woodland, including both well-established and younger plantings, the latter extending into M6, where it is sufficiently open-structured at present to qualify as mosaic. Conspicuous trees in the plantation are poplars, particularly white poplar (some of which have fallen), sycamore, silver birch and willow, and the mix includes natural colonisers. There are occasional to locally frequent shrubs of hawthorn, and the ground flora is dominated by a mix of rough-meadow grass and common nettle, with other secondary woodland species such as herb Robert. Cow parsley is abundant and provides a useful nectar source. Fallen poplars provide a source of dead wood which is probably the most valuable feature of the area for invertebrates, but overall the invertebrate potential is limited.
In the north-east corner of this compartment there is a small area of long-established semi-natural woodland with a canopy dominated by ash, pedunculate oak and hornbeam over a shrub layer of hawthorn, hazel and elder, including some mature coppice stools. Blackthorn is also locally abundant here.

No	Photograph	Notes
		Plantation woodland of W4, largely dominated by poplars and ash with natural regeneration of willow. It is adjacent to the track which forms part of M6.

Key plant species
Ancient woodland indicators
Hornbeam
Hazel

Compartment No. **W5**	Grid reference TL 272 123	Habitats Plantation on ancient woodland site

Description

The southern end of Birchall Wood (W5) is largely a mixed plantation on an ancient site. The canopy is dominated by Scot's pine, though pedunculate oak and silver birch are also very frequent and locally dominant. In some areas there is frequent self-seeded sycamore and young oak. Other species which are locally frequent include wild cherry, larch and sweet chestnut. There is a fine set of hornbeams around the western, eastern and southern boundaries of the wood, which show evidence of having been laid in the past. The shrub layer is generally sparse and is dominated by elder, with birch and oak saplings. The ground flora is dominated by bluebell and bracken with frequent bramble and locally abundant wood anemone.

There is a fair amount of small-diameter dead wood, especially of pine, but no substantial timber. Locally the wood is quite well-structured with sheltered open space along the path. There may be limited interest in the fauna associated with the ground flora and benefiting from sheltered open space.

No	Photograph	Notes
		View south along the sheltered grassy ride in the centre of W2, with dense conifer plantation on each side. Bluebells are abundant along the track edges, but beyond the ground flora is mostly dominated by bracken and bramble.

Key plant species

Ancient woodland indicators

Wood anemone
Bluebell
Wild cherry
Hornbeam
Field maple

Compartment No. **W6**	Grid reference TL 274 126	Habitats Semi-natural broadleaved woodland (ancient)

Description

The eastern part of this wood is dominated by a mix of mature pedunculate oak and sweet chestnut, with ex-coppice hornbeam c 16-18 metres in height, collectively providing a canopy cover of 70-80%. There are occasional planted conifers, predominantly Scot's pine, the more mature trees have a diameter at breast height (dbh) of around 80-90 centimetres. There is a patchy shrub layer, locally dense, consisting mostly of elder with common hawthorn and holly. There is also significant regeneration of oak and hornbeam. Towards the west hornbeam becomes more dominant, predominantly as ex-coppice stools.

The ground flora is sparse, with approximately 10% cover overall. It is dominated by bramble and bracken, but common nettle is locally frequent and there are occasional patches of bluebell which are most extensive in the north-western part of the wood. Wild daffodil was recorded in the north-eastern part of the wood. However, most of the recorded ground flora species are characteristic of disturbed or secondary woodland, and include ground ivy , wood avens, lords-and-ladies, rough meadow-grass and red campion.

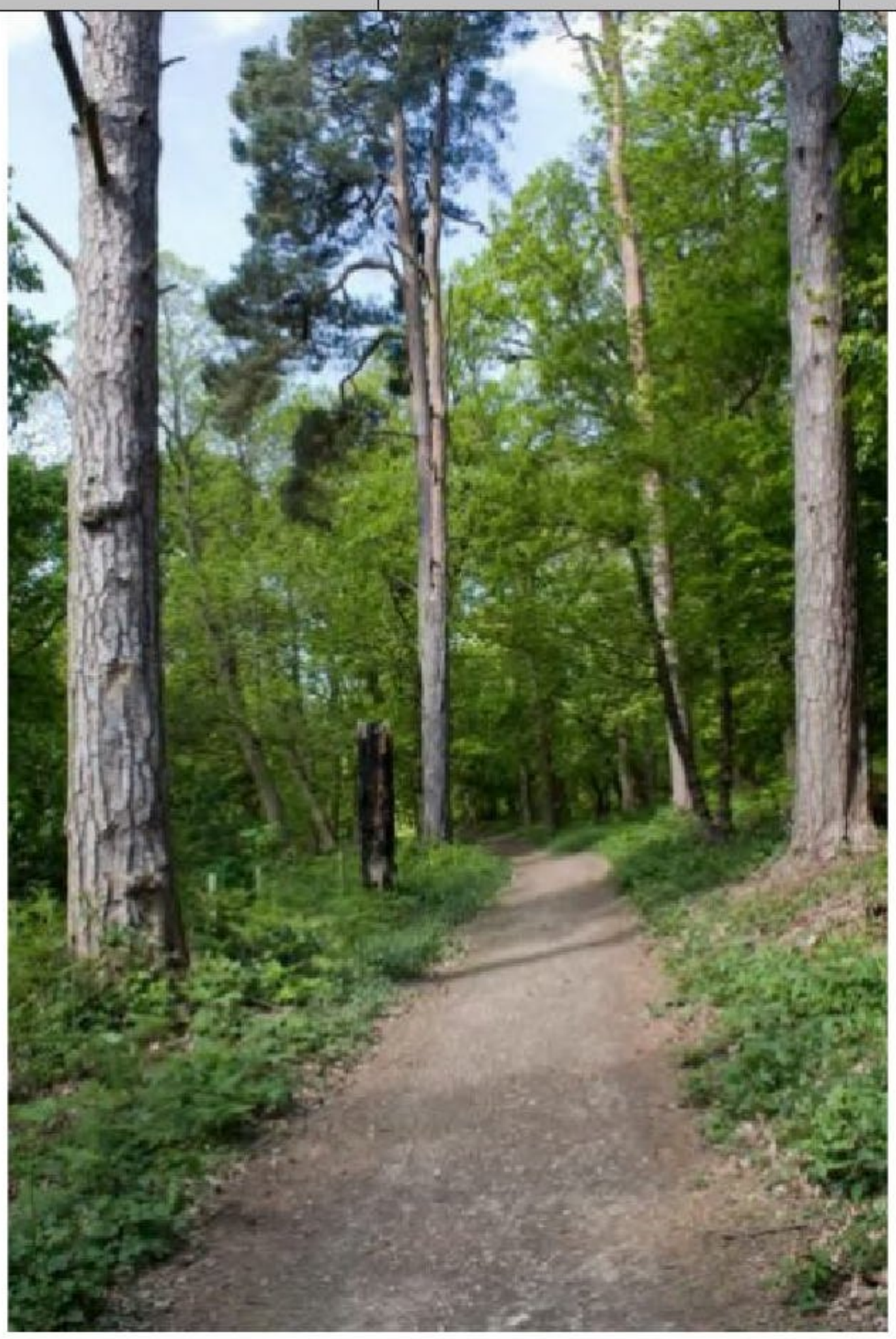
In the north-east corner there is an area of young broadleaved plantation, and cherry laurel is also locally dominant. Along the boundary with Panshanger Lane there is a large population of few-flowered leek, which forms a monoculture early in the season.

There is a fine row of hornbeams along the western edge of the wood, continuing along the margin of W5, which show evidence of having been laid in the past. The southern boundary has the remains of an old hawthorn hedge, and dog's mercury is locally frequent in its vicinity.

There are considerable amounts of dead wood in fallen trunks, standing timber, old coppice stools and stumps and a good saproxylic fauna is assumed, but there is little obvious reason to expect substantial interest in any other aspect of the invertebrate fauna.

No	Photograph	Notes
		View of the southern boundary of the eastern part of W6 showing sweet chestnut-dominated canopy with very patchy ground flora including dog's mercury.

Compartment No. **W6**	Grid reference TL 274 126	Habitats Semi-natural broadleaved woodland (ancient)



View west along the main ride at the eastern end of W6, showing scattered planted pines among oak and hornbeam, and rather poor ground flora of bramble and bracken.

Compartment No. **W6**	Grid reference TL 274 126	Habitats Semi-natural broadleaved woodland (ancient)

View south along a fine row of hornbeams which have been laid in the past, and which extend the full length of W5 and W6.

View of bluebell-dominated area in the north-western part of W6, showing coppice structure, as well as maiden oaks and hornbeam regeneration.

Key plant species

Ancient woodland indicators

Bluebell
Dog's mercury
Field maple
Holly
Hornbeam
Wild cherry
Wild daffodil

Compartment No. **W7**	Grid reference TL 276 115	Habitats Semi-natural broadleaved woodland

Description

W7 is a small, almost square block of high-forest woodland just north of the roundabout. The canopy is dominated by ash, pedunculate oak and hornbeam, and is very dense. Hornbeam is particularly frequent on the western boundary where it shows evidence of having been laid in the past. The shrub layer is very sparse and is dominated by blackthorn, holly, elder and common hawthorn. The wood is bordered by a shallow seasonal drain on the north-west side. The ground flora is dominated by species of disturbed conditions, including common nettle, bramble, cow parsley, ground ivy and cleavers, but there are also a few bluebells.

There are some large trees; dead wood is only moderate in quantity but sometimes in impressive pieces. The presence of large trees with dead wood suggests, on the general principles adopted for assessment, that this area should be graded as 5, and assumed to be of high interest, but this is perhaps a borderline case; the character of the vegetation makes access difficult, and the invertebrate fauna was not sampled.

Key plant species

Ancient woodland indicators

Bluebell
Hairy brome
Holly
Hornbeam

Compartment No. **W8**	Grid reference TL 276 114	Habitats Plantation woodland / hornbeam boundary

Description

The western margin contains old hornbeam, laid in the past, a large standing and a large fallen oak. These features could justifiably be regarded as part of the boundary feature (B23). The interior of the wood is mixed plantation, especially of birch and pine, but also with hornbeam and other trees. The ground flora is dominated by bramble, with locally frequent primrose and lords-and-ladies.
Though generally of limited invertebrate potential, this area does contain a significant amount of dead birch. The old trees at the wood edge are considered to be of high value; the remainder of the wood seems unlikely to be of high interest, but the dead wood has some value.

Key plant species

Ancient woodland indicators
Common figwort
Hornbeam
Primrose

Compartment No. **W9**	Grid reference TL 272 115	Habitats Ancient woodland / recent broadleaved plantation

Description

A varied and interesting area of woodland on predominantly acid soils. The most interesting areas are open-structured, dominated by maiden birch and coppiced hornbeam, with a sparse shrub layer of hazel and holly over a ground flora dominated by bracken and bramble with honeysuckle and locally abundant wood anemone. There are substantial amounts of fallen and standing dead wood. Other areas are notable for the abundance of ferns, particularly broad buckler-fern and male fern. A grassy footpath runs through the woodland, which has a number of additional ancient woodland plant species including remote sedge, wood sedge and wood speedwell. An area of re-planting in the north-east corner is currently of low potential, but is enclosed within the better woodland and is not worth separate coding.

No	Photograph	Notes
		The northern part of W9, with open woodland dominated by birch and hornbeam, and locally abundant wood anemone.

Compartment No. **W9**	Grid reference TL 272 115	Habitats Ancient woodland / recent broadleaved plantation

The footpath, with mature hornbeam coppice and maiden oak over a ground flora of bramble and bracken.

The northern part of the footpath in W9 showing bank with abundant male fern and fringe of wood sedge and remote sedge along the path.

Compartment No. **W9**	**Grid reference** TL 272 115	**Habitats** Ancient woodland / recent broadleaved plantation

Key plant species

Ancient woodland indicators

Broad buckler-fern
Common figwort
Dog's mercury
Enchanter's nightshade
Hazel
Holly
Hornbeam
Pendulous sedge
Remote sedge
Wavy bittercress
Wild cherry
Wood anemone
Wood sedge
Wood speedwell

Compartment No. **W10**	Grid reference TL 273 111	Habitats Ancient woodland

Description

A strip of woodland on the eastern side of W9 and M7, distinguished by a series of ponds (P9, P17-22, P24) and an intermittent watercourse with further small transient or seasonal pools along its length. The wetland receives water from seepage and surface flow from the adjacent M7, and perhaps from other seepages and flushes, and there is outflow via two small streams at the south and north ends. The woodland is continuous with W9, though differing somewhat in character, with a greater component of ash and frequent willows along the valley, while birch and hornbeam are more restricted to higher areas not influenced by base-rich water. There is an outer margin dominated by blackthorn. The ground flora is generally less well developed than in W9, particularly in areas dominated by hornbeam. The flushes areas are sometimes nutrient-rich, with abundant nettles, but also contain a number of characteristic species including dog's mercury, primrose, bugle, marsh thistle and great horsetail, which is locally abundant.

The woodland is less well-structured overall than W9 but contains significant old trees and dead wood. Interest in the old trees and dead wood is assumed. The ponds are varied in character, and wet woodland, especially if there is flowing water, can be of high invertebrate interest. For convenience and consistency, all wetland species recorded from this area have been assigned to P17-22, and non-wetland species to W10, but the two can only be effectively considered and assessed as a single unit.

No	Photograph	Notes
		View across a one of the ponds in spring, showing high water table and locally abundant cyperus sedge.

Compartment No. **W10**	Grid reference TL 273 111	Habitats Ancient woodland

View showing wetland vegetation of cyperus sedge and gipsywort in one of the ponds, with woodland dominated by coppiced hornbeam on higher land.

View along the path showing locally abundant greater horsetail. with oak and hornbeam woodland in the background.

Key plant species

<u>Ancient woodland indicators</u>

Aspen
Bugle
Dog's mercury
Enchanter's nightshade
Field maple
Hornbeam
Primrose
Remote sedge
Wood speedwell

Compartment No. **W11**	Grid reference TL 268 105	Habitats Broadleaved plantation

Description
A plantation of sycamore, poplar, silver birch and wild cherry over nutrient-rich ground with a ground flora dominated by common nettle and cleavers. Spindle is locally frequent along a former hedge line. There is some young standing dead timber, the result of shading and competition as the canopy closes. The woodland is poorly structured, of no great age, and of slight potential for invertebrates.

No	Photograph	Notes
		View of W11 from the north

Key plant species
Ancient woodland indicators
Wild cherry (planted)

Compartment No. **W12**	Grid reference TL 265 105	Habitats Plantation woodland

Description

A thin band of plantation woodland round parts of P14-16. It is dominated by ash and oak, the trees being of no great age but containing a moderate amount of dead wood, especially in the crowns but with some fallen. The ground flora is dominated by common nettle and cleavers, with areas of dense bramble. Wood false-brome is locally frequent along a former boundary bank which also has a number of significant coppiced hazel. There is good growth of ivy on some trees.

This area also includes a narrow triangle of scrub which has been allowed to develop on formerly arable land to the north of the older woodland, which adds a little to structural diversity. This contains a mix of hawthorn, blackthorn, rose, pedunculate oak and hornbeam, with abundant bramble, and is almost impenetrable.

The short stretch of old hedgerow, scrub and seasonal or intermittent drain which joins it to B31 in the west, and which includes some substantial hawthorn and blackthorn, has also been included within its boundary.

Key plant species

Ancient woodland indicators

Hornbeam (only in scrub)
Hazel
Three-veined sandwort

Compartment No. **M1**	Grid reference TL 275 123	Habitats Mosaic

Description

A large, elongate chalk mound, smaller gravelly mounds, and grassy vegetation around and amongst them. The chalk mound is the most significant component. It is of recent origin, and still extensively bare. The long faces are east and west facing; that on the east is shaded by sycamores in the adjoining boundary. The potential for development of interest in such a mound is in principle considerable, but this one is too young for much of that interest to have developed. Herbaceous vegetation is rather species-poor and weedy, and *Buddleia* invasion is extensive. It seems likely that current interest is rather low, and that *Buddleia* coverage will be effectively complete before interest can develop. The gravelly mounds are floristically unexciting, and, though they have areas of open structure and bare ground, colonising vegetation is mostly quite tall, they are in rather damp or part-shaded conditions, and their potential seems low.

Key plant species

None

Compartment No. **M2**	Grid reference TL 272 117	Habitats Mosaic

Description
The area immediately around Birchall Farm is a complex one: several fields, plantations, boundaries and a pond are given separate codings. A strip of habitat south of the farm buildings and along the eastern side of the long pond P5 is placed here. It is not generally of exceptional character, consisting of a mix of species-poor grassland of varying heights, tall ruderals, scrub and occasional trees, but is somewhat distinguished by the range of other habitats and features which it abuts.

No	Photograph	Notes
		View across to the mix of trees, scrub, grassland and tall herb that surrounds P5.

Key plant species
None

Compartment No. **M3**	Grid reference TL 261 105	Habitats Dry and damp grassland, scrub

Description

A rather varied mosaic of habitats, all of which appear to be transitional or developing, none of which seem to be of obvious high intrinsic value but which, in combination, offer a variety which might suggest significant potential. Much of the southern half of the area is damp, dominated by pendulous sedge and great willowherb, with areas of creeping bent, hard rush, fleabane and meadow buttercup. A large number of old vehicle ruts provide small seasonal pools, though none contained free water at the time of survey. Much of the northern part of the area contains moderately species-rich damp to dry grassland. Frequent species include Yorkshire fog, white clover, creeping buttercup and creeping cinquefoil. Leguminous species are very abundant and include large populations of black medick, hairy tare, smooth tare, bird's-foot-trefoil and grass vetchling. The ground slopes down the west, and the slope contain primrose and cowslip. In other areas characteristic neutral grassland species include ox-eye daisy, meadow vetchling, perforate St.John's-wort and germander speedwell, all of which are locally frequent. There is a very high frequency of garden escapes within this area, and these include bloody crane's-bill, Turkish iris, marjoram and balm.

There is patchy but sometimes dense scrub invasion, mostly of grey willow, bramble, sycamore and ash, and a single oak of no great age but interesting structure.

No	Photograph	Notes
		West facing slope at the northern end of M3 with mature oak on left and sycamore and bramble scrub on right.

Compartment No. **M3**	Grid reference TL 261 105	Habitats Dry and damp grassland, scrub

Moderately species rich grassland in the central part of the area, with abundant bird's-foot-trefoil and grass vetchling.

Area of deep ruts with sycamore scrub and locally abundant burdock

Compartment No.	Grid reference	Habitats
M3	TL 261 105	Dry and damp grassland, scrub

Damp vegetation towards the southern end of the compartment, with abundant pendulous sedge and grey willow scrub

Key plant species

England Red list Near Threatened

Wild strawberry

Neutral grassland indicator species

Bird's-foot-trefoil
Cowslip
Germander speedwell
Glaucous sedge
Grass vetchling
Lesser stitchwort
Meadow buttercup
Meadow vetchling
Ox-eye daisy
Red clover

Wet grassland indicator species

Fleabane
Purple loosestrife

Ancient woodland indicator species

Primrose

Compartment No. **M4**	Grid reference TL 262 109	Habitats Woodland, scrub, stream, ruderal, grassland

Description

A strip of grassland, tall herbs, scrub, and woodland along both sides of a small stream, the course of which has been broadened to form two ponds (P12 and P13). In the south the stream runs in a rather deep, steep-sided, scrub-shaded channel, and there is little to suggest interest. The stream itself is of negligible interest, though it is perhaps at its highest potential towards the extreme southern end, where there is less shade and the bed, silty through most of its course, includes exposed gravel. The character of the bed may, however, be subject to rapid short-term change in response to changes in flow. Further north the marginal habitats broaden, the banks of the channel become less extreme, and the scrub of hawthorn, blackthorn, elder and bramble is diversified by substantial willows along the stream course, by larger trees, especially of ash, on drier parts, and by some very large hazels. A line of five large oaks, not veteran but with significant dead wood in their crowns, extends north-west into a bordering arable field.

In the broadest part of this area, in the north, the stream, after broadening into two substantial ponds, is largely scrub-shaded again, and land on its west side contains rank grass and tall herbs, seemingly on nutrient-rich soils, in mosaic with scrub, with deep vehicle ruts. The grassland is mostly species poor, but contains a small population of bee orchid, as well as a small number of neutral grassland indicator species. The tall ruderals include great willowherb in damper areas, hemlock, teasel, creeping thistle and goat's rue.

The whole area has the look of enriched and degraded habitat, but the possibility of relic interest remaining in what may be an old landscape feature cannot be ruled out, and the mosaic structure provides sheltered conditions. Any invertebrate interest is likely to be localised, and largely represented in the saproxylic fauna. The ponds are very much contained within the wider area, and it might be thought that they should be considered and sampled along with the rest as a single unit. They are, however, sufficiently distinct and abrupt that separate assessment and sampling has been considered appropriate.

No	Photograph	Notes
		Rutted tracks in the north part of the compartment, fringed with tall ruderals including hemlock and teasel, with areas of dense hawthorn scrub.

Compartment No. **M4**	Grid reference TL 262 109	Habitats Woodland, scrub, stream, ruderal, grassland

Mosaic of bare ground, grassland dominated by Yorkshire fog, rough meadow grass and creeping cinquefoil, with scattered scrub and ruderals. There is a small population of bee orchid.

Key plant species

Ancient woodland indicator species
Midland hawthorn
Hazel
Neutral grassland indicator species
Bee orchid
Germander speedwell
Meadow vetchling

Compartment No.	Grid reference	Habitats
M5	TL 264 113	Neutral grassland, scrub, plantation woodland

Description

A broad belt of habitat fringing, and on the slopes around, the fishing lake (P10). Woody vegetation immediately around the lake is willow-dominated but is planted and very varied, including white willow, crack willow, weeping willow, grey willow and osier, and appears to have been ornamental in intent. There are also some poplars and occasional conifers. The planted trees are old enough to have developed significant dead wood in places, though there are also younger, often self-sown, trees and shrubs. The fringe of well-established woody vegetation extends some way back from the margins, where it merges with some apparently semi-natural woodland vegetation, dominated by field maple, with occasional pedunculate oak and a ground flora of ivy. This vegetation contains some large pieces of dead wood.

There are areas of more open structure, with grassy vegetation and stands of ruderals, and on the west side of the lake there is a steep slope with bare ground. In the south-east there is a more extensive scrub/grass mosaic. The grassland here includes a number of neutral grassland indicators, including locally abundant common knapweed, ox-eye daisy, wild carrot and meadow vetchling, as well as smaller amounts of perforate St. John's-wort and bird's-foot trefoil.

In the north-east there is a broad triangle of recent plantation which contains a mix of broadleaved species The plantation is of negligible interest.

No	Photograph	Notes
		Woody vegetation dominated by willows fringing P10, with scattered conifers and poplars further away from the lake edge
		Mosaic of neutral grassland and scrub in the south-east corner with abundant common knapweed.

Compartment No. **M5**	Grid reference TL 264 113	Habitats Neutral grassland, scrub, plantation woodland

Key plant species

Neutral grassland indicator species

Agrimony
Bird's-foot trefoil
Common knapweed
Meadow vetchling
Ox-eye daisy

Wet grassland indicator species

Fleabane

Compartment No.	Grid reference	Habitats
M6	TL 265 115	Grassland, bare ground, scrub, plantation

Description

A rather narrow strip of habitat, lightly managed or unmanaged, running beside a track.

In the north-west, the track and its fringes are currently well-structured. Scrub and young trees along the southern side of the track provide shelter without excessive shade; grassland and ruderal vegetation along the track are varied, reasonably flower-rich, and include bare ground; and on the north-side the mosaic structure extends into a planted area which at present is open enough to retain a substantial component of sheltered grassland. The well-structured track continues narrowly along the edge of the active landfill, and a branch turns to the south-west through a broadened area of grassland, of a kind with the bordering horse-grazed field but fenced from it and so of more varied structure. This varied structure in enhanced by an east-facing slope, areas of damper grassland and seasonal flooding, some taller grassland and tall herbs, scrub of bramble and rose, young planted trees of a mix of species, and an area of invasive aspen. The margins of the track are well-structured and support quite broad bands of short, open-structured ruderal vegetation. Rabbit grazing and digging is critical to the maintenance of structural variety. The potential of this mosaic is in part the result of its particular successional stage, and much is potentially threatened by continued growth of planted trees and self-sown scrub.

This compartment supports some of the best MG5-type grassland in the survey area. Rabbit grazing maintains areas of short sward which support frequent bird's-foot-trefoil, black medick, hop trefoil, creeping cinquefoil, self-heal , germander speedwell and yarrow. Longer areas of grassland around the margins of scrub, have locally frequent to abundant common knapweed, ox-eye daisy and perforate St.John's-wort. Open structured grassland near the track edge supports a range of spring ephemerals including common whitlowgrass, sticky mouse-ear, small-flowered crane's-bill and wall speedwell.

No	Photograph	Notes
		View along the cycle track at the southern end of M6.

Key plant species

England Red list Near Threatened

Wild strawberry

Neutral grassland indicator species

Agrimony
Bee orchid
Bird's-foot-trefoil
Common knapweed
Crested dog's-tail
Grass vetchling
Lesser stitchwort
Meadow buttercup
Ox-eye daisy
Red clover

Nationally scarce species

Early meadow-grass

Compartment No. **M7**	Grid reference TL 271 112	Habitats Plantation, neutral grassland, marsh

Description

Mixed broadleaved plantation on landfill, with open spaces, the latter mostly on wet ground and including sedge-rich grassland, rush-dominated marsh, seepages, shallow pools, and surface flow through *Epilobium hirsutum* and *Typha latifolia*.

The plantation itself is of relatively low intrinsic potential except where trees have failed and provide dead wood, but contributes to the overall mosaic structure and the provision of sheltered open space. The more open dry areas are possibly of higher interest than is initially apparent, or has been recorded, since the network of open space is enhanced by rabbit activity and may have a relic fauna from previously more open conditions. A small number of neutral grassland indicators are present in grazed areas including bugle, common centaury and bird's-foot-trefoil. Wild strawberry is locally abundant. In less well-grazed areas there are dense stands of ruderals, particularly teasel and goat's-rue.

Open wetland areas are of much higher invertebrate potential, but the habitat may be too young to have colonised fully, and its potential is in substantial measure determined by summer conditions, when it may be somewhat drier than is ideal. Some areas, particularly towards the western part of the wetland, are dominated by hairy sedge, whilst other areas are dominated by hard rush, great willowherb and marsh thistle with abundant pointed spear-moss. None of the marsh is very species-rich, though a small number of characteristic species are present at low density, including marsh bedstraw, greater bird's-foot-trefoil and green-ribbed sedge.

The wetland area is predominantly along the eastern side of M7, and flow feeds into the wetland features along W10; the two could usefully be combined into a single survey area for wetland invertebrates. Interest is threatened by growth of planted trees, which will shade out interest and dry the wetland if left unmanaged.

No	Photograph	Notes
		Relatively mature plantings along the southern margin of M7, with dense understorey of bramble

Compartment No. **M7**	Grid reference TL 271 112	Habitats Plantation, neutral grassland, marsh
		Marshy area dominated by hairy sedge, with areas of pointed spear-moss
		Main area of marsh, dominated by hard rush, with rosettes of great willowherb and marsh thistle.

Compartment No. **M7**	Grid reference TL 271 112	Habitats Plantation, neutral grassland, marsh

Main area of marsh in October, with great willowherb much more prominent.

Key plant species

England Red list Near Threatened

Wild strawberry

Neutral grassland indicator species

Bee orchid
Bird's-foot-trefoil
Bugle
Common centaury
Common knapweed
Ox-eye daisy

Wet grassland indicator species

Greater bird's-foot-trefoil
Green-ribbed sedge
Marsh thistle

Compartment No. **M8**	Grid reference TL 275 112	Habitats Arable, marsh, drain

Description

Formerly arable land. The western, lower-lying, part has seemingly been abandoned to fallow for some time, and supports a mix of tall ruderals, local wetland vegetation, and grassland. The rankest vegetation is in the northern part of this field and comprises a mix of great willowherb, common nettle, spear and creeping thistle, with frequent water figwort. Towards the south and east the vegetation becomes grassier, with abundant Yorkshire fog and locally frequent bird's-foot-trefoil, bugle, hairy sedge and marsh thistle. There is a scatter of other characteristic wetland species including wild angelica, square-stemmed St.John's-wort and ragged robin.

The eastern, higher, part appears to have been sown with a bird-seed crop, and has a mix of bare ground, annual species and tall ruderals, with shorter more open areas maintained by rabbit grazing. The dominant ruderal species are bristly ox-tongue, fat-hen and creeping thistle. There is a good variety of annual arable weeds including frequent field madder and marsh cudweed.

This area is interesting and unusual in a site context, and the variety of vegetation and the interesting position hold out the possibility of invertebrate value. Recorded invertebrate interest is largely in wetland species from the lower-lying area. This area has been recorded along with drain B23, which flows between the upper and lower parts but has not been separately recorded. It is likely that this drain was dug to intercept water seeping from the slope, and so render the ground downhill more amenable to agriculture, and that the wetland interest is either a remnant of former habitat or has re-colonised since the abandonment of arable cultivation. There is considerable scope here for enhancement by blocking and re-profiling the drain and returning seepage conditions.

No	Photograph	Notes
		Area of mixed bird-seed and arable weeds with a large ash along B23 in the background

Compartment No. **M8**	Grid reference TL 275 112	Habitats Arable, marsh, drain

Key plant species

Neutral grassland indicator species

Bird's-foot-trefoil
Bugle

Wet grassland indicator species

Marsh thistle
Ragged-robin
Wild angelica

Arable species

Many-seeded goosefoot (2)
Field madder (1)
Wild radish (1)

Compartment No. **M9**	Grid reference TL 274 109	Habitats Neutral grassland, scrub, semi-natural woodland

Description

A rather varied area containing a number of features of value for invertebrates, forming an essentially linear feature along both sides of the cycle path. In the west a neutral grassland strip, with incipient scrub invasion, borders the south side of the cycle track, while the north is bordered by the young plantation woodland of M7, except at the extreme western end where there is a small triangle of scrub-bordered grassland. Further east, to the south of the track, at and beyond the point where it meets the old strip of Holwellpark Wood, there is a small area of woodland/scrub, including no very old trees but containing oak, hornbeam, blackthorn, and elder. A bank with extensive bramble rises to a footpath on the south side. The ground flora is poor, dominated especially by common nettle. On the opposite side of the track a tall hedge tops a bank where rabbit burrowing has produced extensive bare ground. Short grassland and ruderals along the track margins broaden into a small but significant area of grassland on the south side of the track beyond the trees and shrubs, and is continuous with (though fenced from) horse-grazed grassland beyond; east and north of this is further mixed scrub. None of these minor features is in itself of very high potential, but the combination, in a limited area, sheltered by woody vegetation and topography, may support an interesting fauna, especially since the area is, in part, an old landscape feature.

This compartment contains a high diversity of plants, though none of outstanding interest. It is one of the few compartments on the site that supports hedgerow species such as hedge bedstraw and stone parsley.

No	Photograph	Notes
		The southern end of M9, showing short rabbit-grazed grassland with dense scrub and trees.

A typical section further north, showing rank, but moderately diverse grassland along the edges of the cycleway, with scrub and planted trees.

Key plant species

Ancient woodland indicator species

Hornbeam

Neutral grassland indicator species

Agrimony

Common sorrel

Grass vetchling

Compartment No. **M10**	Grid reference TL 274 107	Habitats Plantation, rank grassland

Description
A mix of rather poor examples of habitat features, some of which could, in principle, be of interest for invertebrates. A gravelly mound includes some bare ground, assisted by rabbit grazing and burrowing, but is largely vegetated and with rather tall, coarse grassy vegetation; low-lying areas have damp grassland with small seasonal pools in ruts and hollows, but these are too transient and nutrient-rich for significant interest; an area of plantation was formerly kept open by horse and rabbit-grazing and is structurally interesting, but is too young for interest in the woody vegetation and is now fenced, so any interest in the herbaceous vegetation will be transitory as the canopy closes; bramble-dominated scrub adds to structural diversity, but not to an encouraging extent.

Key plant species
Local species
Early meadow-grass

Compartment No. **M11**	Grid reference	Habitats Scrub, ruderal

Description
A mosaic of trees, scrub and ruderal vegetation between an arable field and housing. The vegetation is coarse and impenetrable with banks of creeping thistle and common nettle around the margins, and scattered to dense scrub of grey willow and blackthorn in the interior. There are a number of young ash trees, and one mature oak close to the housing. This has a small amount of invertebrate potential in its current state, perhaps more as a foraging area than for contained breeding species, but any such interest is likely to decline as the scrub thickens.

No	Photograph	Notes
		View of M11 showing dense ruderal vegetation, with banks of scrub and a single mature oak.

Key plant species
None

APPENDIX 9.1.3
BIRCHALL NORTH - HEDGEROW ASSESSMENT UNDER THE HEDGEROW REGULATIONS 1997

		B1SE	B1NW	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B15	B16	B17	B18
Acer campestre	Field Maple		o	r			r	r				r	la			lf	
Acer pseudoplatanus	Sycamore							d									
Carpinus betulus	Hornbeam	a-d	d						lf	d	ld					lf	lf
Cornus sanguinea	Dogwood	r															
Corylus avellana	Hazel	o	o													r	o
Crataegus monogyna	Hawthorn	a	o	d	a	f	d	a	a	lf	f	d	o	o	d	o	o
Crataegus laevigata	Midland hawthorn	r	r														
Euonymus europaeus	Spindle	r				f		r	lf								
Fraxinus excelsior	Ash		f			f		o	o	o	r						
Ilex aquifolium	Holly	o	o	r				o			r				r	la	la
Ligustrum vulgare	Wild privet				a	f											
Malus sylvestris	Crab apple			r				r	r		f						
Prunus avium	Wild cherry						r										
Prunus sp.	Plum /cherry plum			r		r			o			r			o		
Prunus spinosa	Blackthorn	lf	lf				f		lf	lf	ld		d	ld		f	ld
Quercus robur	Pedunculate oak	f	f	r		o		f	o					r	r	o	r
Rosa arvensis	Field rose		r													r	
Rosa canina	Dog rose	o		r	r	r					r		r			o	r
Sambucus nigra	Elder	o	o	o	r			r	f	o	f			r	r		r
Ulmus sp.	Elm	lf												lf			
Woody species in Regulations in hedge		12	11	8	4	7	4	8	9	5	8	3	4	5	5	9	8

Total length (m)	720	720	295	193	93	109	777	274	197	272	235	180	170	164	842	226
Average woody species / 30m	5.3	6	4	2	4.5	3	4	4.3	4	3.6	2	4	3.5	3.5	5	5
Hedgerow flora noted (minimum of 3)	yes	no	no	no	no	no	yes	no	no	no	no	no	no	no	no	no
Bank along ½ length	yes	yes	yes	no	no	no	yes	yes	yes	no	no	no	no	no	yes	no
Ditch along ½ length	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Less than 10% gaps	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes
More than 1 standard tree/50m	yes	yes	no	no	yes	no	yes	yes	no	no	no	no	no	no	no	no
Number of connections (minimum of 4)	4	4	6	3	4	3	4	4	4	1	2	3	1	1	4	5
Parallel hedge	yes	yes	part	no	yes	no	no	no	no	no	no	no	no	no	yes	yes
Number of features	6	5	4	1	4	1	4	4	3	1	1	1	0	1	4	3

Adjacent to public path or bridleway	yes	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	no	no
Parish Boundary	yes	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no

Likely to qualify as important?	yes	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	yes	no

Hedgerow descriptions

B1 A rather complex boundary: there are old hornbeams, seemingly part of a previously laid hedge, along the outer edge of the green lane along the margin of the site. These extend to the limit of housing, where they are replaced by more varied woody vegetation with old trees, mostly ash and oak, but with locally frequent elm, much of which is dying. This part of the boundary supports a woodland flora containing species such as bluebell, dog's mercury, greater stitchwort, wood sedge, wood melick, lords-and-ladies and lesser celandine. Throughout, this side of the green lane is shaded by woody vegetation on the opposite side - a mirroring line of hornbeams in the west, more extensive recent plantation in the east. Mixed scrub, with blackthorn a prominent component, combines with the old trees and provides a potentially interesting transition on the survey area side, but has been extended and compromised by a band of mixed broadleaved plantation along the field edge, at present still very young and with grassy vegetation beneath.

B2 Possibly a hedge in the past, but now a dry ditch with bramble and common nettle along the top. The northern section has scattered veteran trees and is linked to P1.

B3 Scattered veteran trees along a former hedge-line.

B4 A 3m high managed hawthorn hedge on top of a slight south-facing bank. It is slightly more species-rich towards the eastern end, where it forms a short stretch of green lane with H6. There is a good mature oak towards the middle, with a dbh of c.1m and spreading crown.

B5 An L-shaped managed hawthorn dominated hedge approximately 3m in height, with no standard trees, apart from a single ash at the junction with H6. Wild privet is locally abundant.

B6 A short hedge running parallel to the eastern end of H5. It is quite mixed, with frequent hawthorn, wild privet and spindle, and is about 2m in height. There are some fine ash grown from ex-coppice, and a single young oak standard.

B7 A low hawthorn dominated hedge along the southern boundary of a private property.

B8 A roadside hedge, rather gappy at the southern end, with frequent stretches of bramble. The northern end is outgrown and is actually a row of trees rather than a hedge. At the northern end there is a woodland ground flora with species such as dog's mercury, lesser celandine, bluebell and greater stitchwort.

B9 A somewhat variable hedge: the northern section has been recently replanted with hawthorn, and there is frequent bramble; to the south there is a stretch of somewhat gappy hawthorn-dominated hedge, approximately 2m in height, and probably laid in the past; the extreme southern end, where it approaches H10, is more species-rich, with hornbeam, spindle and crab apple. There are several fine standard trees, with two veteran oaks at the northern end and some fine ash further south.

B10 Continuous with H9, but dominated by hornbeam, approximately 4m in height. It is currently flailed but has been laid in the past, and the hornbeams are of considerable age. To the south there is more hawthorn. There is a single standard oak tree, of moderate age.

B11 A managed hawthorn-dominated hedge approximately 3m in height with a single standard ash. Blackthorn is locally dominant at the eastern end.

B12 Newly established hawthorn dominated hedge approximately 5m in height, forming the boundary with the A414.

B13 Newly planted shelter belt with established hedge c. 3m high along the road boundary. The northern end has been newly planted with a mixed hedge, of hawthorn and blackthorn with occasional spindle, dogwood, field maple and hazel.

B14 Possibly a hedge in the past, but now a bank of bramble with hogweed and cow parsley. There are occasional wild rose bushes and patches of elm.

B15 A low, very gappy hedge; more accurately a series of patches of linear scrub each 20-30m in length, dominated by blackthorn and elm, with occasional common hawthorn.

B16 A low hedge, approximately 2.5m in height and 1.5m wide, dominated by hawthorn. There is a single large oak present, with a dbh of >1m, and becoming stag-headed. The southern end is a newly planted hawthorn hedge, with occasional spindle and field maple.

B17 Roadside hedge running along the southern boundary of the site, at the edge of the B195. It is generally at least 4m in height and has a good range of woody species, though few standard trees. There is a new plantation to the north of it.

B18 A quite varied hedge, in places 4m tall and very mixed, in part almost pure blackthorn cut to a height of 2m, linked at its western end to a small woodland fragment isolated from Great Captain Wood by Cole Green Lane

B19 Scattered scrub along a fence line.

Birchall South
Hedgerow Assessment under the Hedgerow Regulations 1997

		B21	B22	B31	B32	B33	B40	B41
Acer campestre	Field Maple	o	r			lf	f	a
Carpinus betulus	Hornbeam					d	o	
Cornus sanguinea	Dogwood	o				lf		
Corylus avellana	Hazel	f				r	o	
Crataegus monogyna	Hawthorn	r	a	a	d	o	a	a
Fraxinus excelsior	Ash	f	f			o	o	f
Malus sylvestris	Crab apple	r	r			r	r	
Prunus cerasifera	Cherry plum			a				
Prunus spinosa	Blackthorn	ld	la			lf	f	a
Quercus robur	Pedunculate oak	f				f	o	r
Rosa canina	Dog rose	o			o	o	f	r
Salix caprea	Goat willow							lf
Salix cinerea	Grey willow	r						r
Salix aurita	Eared willow	r						
Sambucus nigra	Elder				o	o	a	o
Viburnum opulus	Guelder-rose						r	
Woody species in Regulations in hedge		10	6	2	3	11	11	9

Total length (m)	191	162	308	175	470	442	207
Average woody species / 30m	6.5	3	2	2	6	4	4.6
Hedgerow flora noted (minimum of 3)	no	no	no	no	no	no	no
Bank along ½ length	no	no	no	no	yes	no	no
Ditch along ½ length	yes	yes	no	no	no	no	yes
Less than 10% gaps	yes	no	yes	yes	yes	no	yes
More than 1 standard tree/50m	yes	yes	no	no	yes	no	yes
Number of connections (minimum of 4)	1	3	3	4	3	4	1
Parallel hedge	no	no	yes	yes	no	no	no
Number of features	3	2	2	3	3	1	3

Adjacent to public path or bridleway	no	no	yes	yes	no	no	no
Parish Boundary	no	no	no	no	no	no	no

Likely to qualify as important?	yes	no	no	no	yes	no	no

Description of hedges

B21 Narrow drain, rather steep-sided, containing very shallow water at the time of survey and probably seasonal, running in an open channel in the northern part of its course, then alongside a blackthorn-dominated hedge which is old, rather variably structured and species-rich. It has a number of large hazel coppice stools, as well as crab-apple and dogwood, There are a number of oak and ash standards, these being of some potential but neither very old nor very large.

B22 A small stream, in a rather steep-sided channel and containing only shallow water at the time of survey, running, in the west, alongside an old hedge containing some mature trees and with significant dead wood, especially of ash.

B24* Undistinguished young hedge with a mix of blackthorn, hawthorn, dog rose, dogwood and hazel, bordering the A414, somewhat enhanced adjacent to M8 by following a track and bordered by sheltered, west-facing, rabbit-disturbed open-structured ruderal vegetation.

B25* Laid hedge with standard shrubs and young trees; interestingly structured and perhaps with long-term invertebrate potential, but young and unexceptional at present.

B26* Young and unexceptional mixed hedge with equally young trees, along the boundary with the A414.

B31 A short (1.5-2m) species-poor hedge, dominated by hawthorn and cherry-plum.

B32 A tall species-poor hedge, dominated by hawthorn.

B33 Old hedge-line with substantial old trees, following, as delineated for the scoping survey, a rather irregular route. The easternmost section, running roughly north-south, includes old hornbeams beside a largely dry drain; the part to the west, following a somewhat zig-zag course, contains two old pollard ash, four large old oaks, old hornbeam coppice, and blackthorn and hawthorn with good structure and, in places, substantial dead wood.

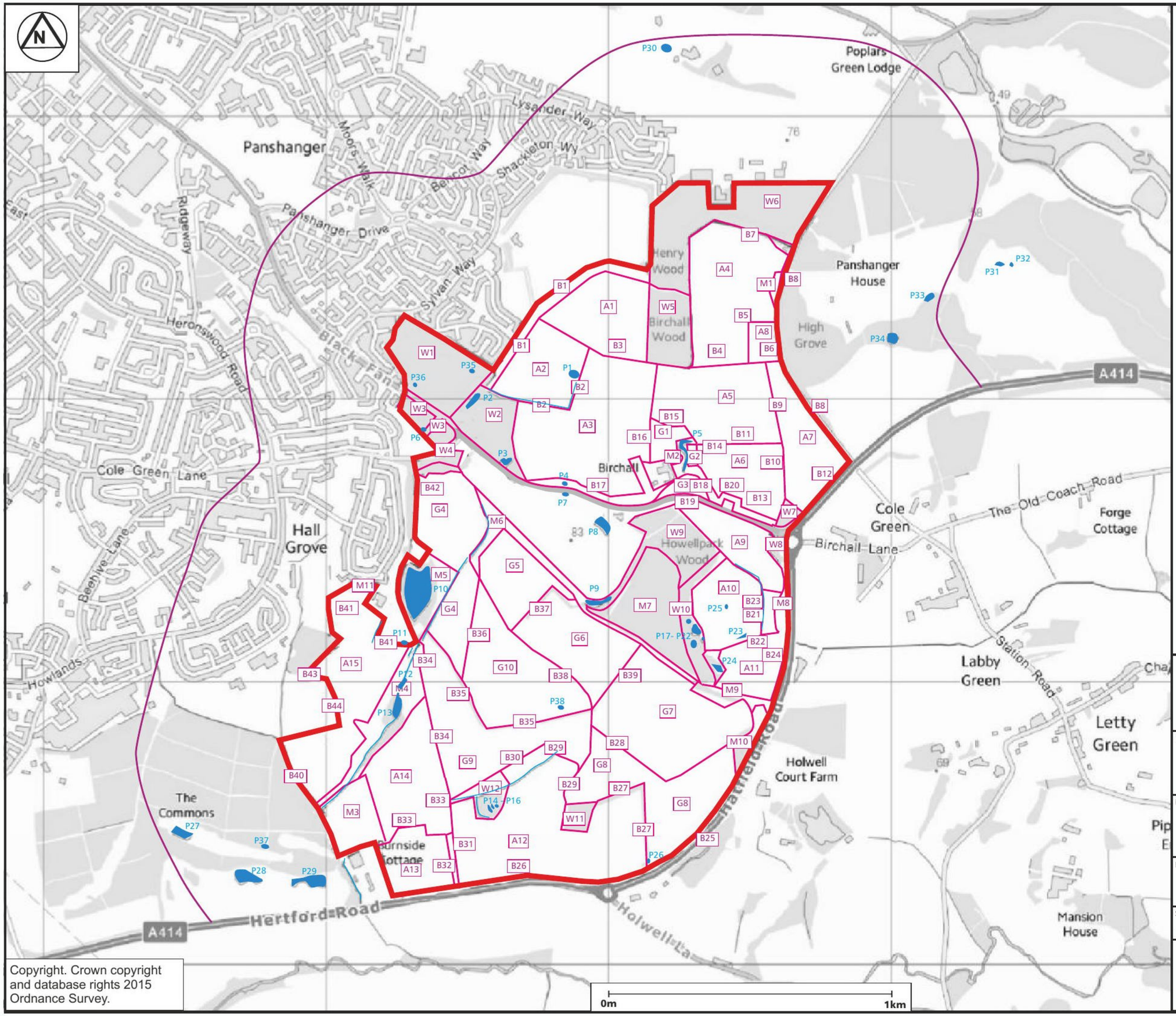
B34* A fairly young tall hedge, hawthorn-dominated, becoming more varied in the north where it borders M4; quite well-structured but unexceptional.

B36* Poorly-structured recently planted hedge dominated by blackthorn and hawthorn with a few young poplar trees.

B40 A mixed hedge, of variable height, backed for most of its length in the west by woodland beyond the site boundary, and containing well-grown trees with overhanging foliage above a nettle- and great willowherb-dominated fringe of tall grass and herbs. This fringe is narrower along the northern arm, within which there are scattered mature to old oaks with substantial dead wood in the crowns.

B41 A mature hedge dominated by blackthorn and hawthorn, with frequent ash and one sizeable oak, adjacent to a dry ditch.

B44* An unexceptional and rather ill-kempt hedge dominated by hawthorn, elder, field maple, bramble, rose, fronted by a strip of coarse grassland one to two metres in width. Although there is a scatter of old elder bushes, the majority of the shrubs have been recently planted and include ancient woodland species such as hazel and hornbeam.



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KEY

Immediate Study Area (note boundary to be changed)

Compartments

- W- Woodland
- M - Mosaic, usually containing mix of scrub, trees, open vegetation, grassland + possibly wetland features
- G - Grassland
- A - Arable
- B - Boundaries which include hedges, shelter belts, streams and ditches or a combination of these

500m radius from application boundary

P — Location of ponds/ditch

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CLIENT

TARMAC
A CRH COMPANY

PROJECT

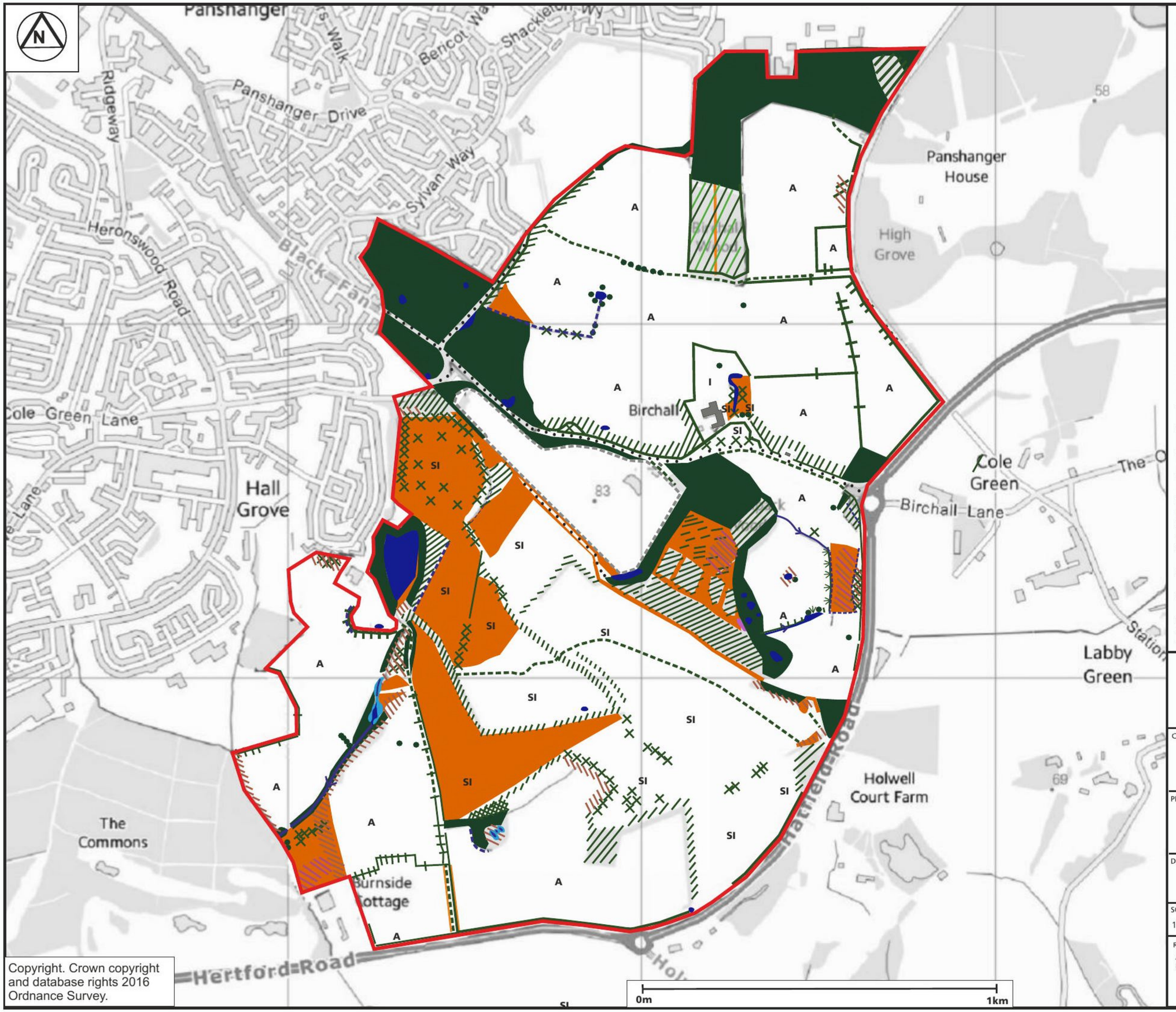
BIRCHALL GARDEN SUBURB

DRAWING TITLE

SURVEY COMPARTMENTS & PONDS

SCALE	DATE	DWG NO	REV
1:15,000 @ A3	FEB 2016	APPENDIX 9.1.1	

REV	DATE	DETAILS



KEY

- Immediate Study Area
- Semi-natural woodland, broadleaved
- Plantation woodland, broadleaved
- Plantation woodland, coniferous
- Isolated trees
- Scrub
- Ephemeral
- Unimproved neutral grassland
- SI — Semi-improved neutral grassland
- I — Improved grassland
- SI — Species poor semi-improved grassland
- Tall herb ruderal
- Marsh/marshy grassland
- Open standing water
- Running water
- Dry ditch
- Swamp
- Neutral flush
- Intact hedge, species poor
- Hedge and trees, native species-rich
- Hedge and trees, species poor
- Defunct hedge, species poor
- A — Arable
- Bare ground (track/road)
- Built area
- Area not accessed/surveyed

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CLIENT

TARMAC
A CRH COMPANY

PROJECT

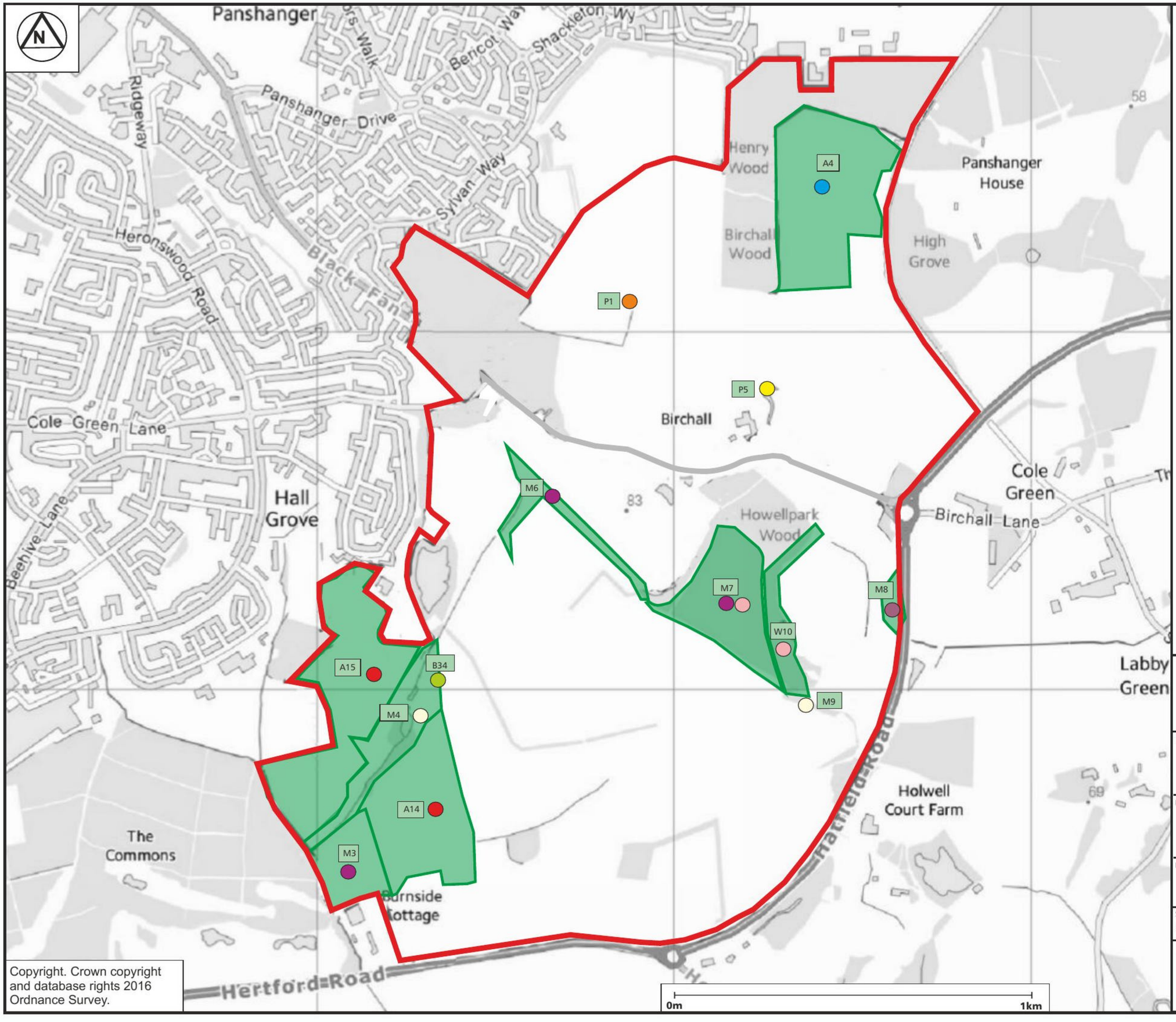
BIRCHALL GARDEN SUBURB

DRAWING TITLE

PHASE 1 HABITAT MAP

SCALE	DATE	DWG NO	REV
1:10,000 @ A3	AUG 2016	APPENDIX 9.1.2 B	

REV	DATE	DETAILS
A	JUNE 2017	Details updated
B	JULY 2017	Details updated



KEY

- Immediate Study Area
- M - Mosaic, usually containing mix of scrub, trees, open vegetation, grassland + possibly wetland features
- A - Arable
- B - Boundaries which include hedges, shelter belts, streams and ditches or a combination of these
- P - Pond
- Compartment with rare plant species
- Rye-brome
- Bladder sedge
- Fine-leaved water-dropwort
- Cornflower
- Heath speedwell
- Wild Strawberry
- Field scabious
- Early meadow-grass
- Ragged-robin

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CLIENT

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A CRH COMPANY

PROJECT

BIRCHALL GARDEN SUBURB

DRAWING TITLE

LOCATION OF RARE PLANT SPECIES

SCALE	DATE	DWG NO	REV
SEE SCALE BAR	AUG 2016	APPENDIX 9.1.3	

REV	DATE	DETAILS