CALDECOTE FARM

NEWPORT PAGNELL · MILTON KEYNES

APPENDIX 6

ENVIRONMENTAL STATEMENT

ECOLOGY AND NATURE CONSERVATION

APPENDIX 6.1
DESIGNATED SITES & HABITAT REPORT

newlands developments

Newlands Developments

Land at Caldecote Farm, Newport Pagnell

Appendix 6.1 Designated Sites & Habitat Report

July 2021

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Rev	Issue Status	Prepared / Date	Checked by / Date	Approved/Date
-	Draft	JAT / 19.06.18	TJM / 22.06.18	PH / 22.06.18
	Final	JAW / 04.03.21		

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APPENDIX

1.0 INTRODUCTION

1.1 The following report has been prepared by FPCR Environment & Design Ltd on behalf of Newlands Developments and provides details of a desk study and habitat surveys undertaken at a site known as Land at Caldecote Farm, Newport Pagnell.

1.2 This report should be read in conjunction with the Environmental Statement[1] and associated protected species reports produced for the site.

Site Location and Context

1.3 The site is located between Milton Keynes and Newport Pagnell in Buckinghamshire, central grid reference SP 8757 4228 (see Figure 1). The M1 motorway corridor forms the boundary to the west of the site, whilst Monks Way (A422) bounds the north / north-west boundary and Willen Road is located immediately to the east. Surrounding land use in the wider area consists of existing residential areas of Newport Pagnell to the north and Tongwell Industrial Estate and adjacent residential areas, comprising Willen and Blakelands to the west of the M1. To the east is an active sand and gravel extraction site and further afield land comprises extensive open farmland and habitats associated with the River Ouzel.

1.4 The site comprises a field compartment which has been partially restored to agriculture following cessation of historic mineral extraction activities. The site currently consists of species-poor grassland interspersed with tall ruderal species and scattered scrub. The eastern extent of the site comprises remnant sand and gravel deposits, shallow ephemeral pools and bunds in varying stages of succession from bare ground and poor semi-improved grassland. The site is bound by native hedgerows to the east, west and part of the north boundary which widen to highway planting where associated with the A422 and Willen Road. Also within the site boundary is part of the carriageway of Willen Road and a section of the adjoining arable field compartment.

Development Proposals

1.5 The development proposals entail the erection of two storage and distribution units (Class B8) with associated access, car parking, servicing, landscaping, earthworks and drainage.

2.0 METHODOLOGY

Desk Study

2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations for the purposes of this appraisal, including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk);
- Buckinghamshire & Milton Keynes Records Centre (BMERC)

2.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide

[1] FPCR, 2021 Land at Caldecote Farm, Newport Pagnell Environmental Statement

additional context and identify any features of potential importance for nature conservation in the wider countryside.

2.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 5km around the subject site for sites of International Importance, e.g. Special Area of Conservation (SAC) & Ramsar sites;
- 2km around the subject site for statutory sites of National/ Regional importance, e.g. Sites of Special Scientific Interest (SSSI);
- 1km around the subject site for non-statutory sites of County Importance, e.g. Local Wildlife Sites (LWSs) and potential LWSs (pLWSs),

Habitats

2.4 The survey was undertaken in April 2016, and updated in May 2018 and January 2021, using the standard methodology (JNCC, 2010[2]), as recommended by Natural England, to identify specific habitats and features of ecological interest. Habitats were marked on a base plan and where appropriate, target notes were made. An inspection of the site for the presence of any invasive weed species was also carried out. Features such as trees were considered with regard to their ecological value and potential to provide suitable habitats for protected species.

2.5 Hedgerows were surveyed individually using the Hedgerow Evaluation and Grading System (HEGS) (Clements and Toft, 1993[3]) to enable identification and evaluation of hedgerows of nature conservation importance within the site. Hedgerows were graded on a scale of 1-4, within which grades 1 and 2 are generally considered to be of nature conservation priority:

1= high to very high value

2 = moderately high to high value

3 = moderate value

4 = low value.

2.6 Hedgerows were also considered against the Hedgerow Regulations 1997[4] Wildlife and Landscape criteria, to identify any hedgerows, which would be classified as "important" for nature conservation under this part of the act. Under this methodology, hedgerows are considered according to the average number of woody species per 100m of hedgerow. Additional features which enhance hedgerows, when found in association with the hedge, such as mature trees, ditches and hedge banks are also considered.

2.7 It should be noted that hedgerows may also qualify as Important under the Archaeological criteria of this Act, which is beyond the scope of this assessment.

[2] Joint Nature Conservation Committee 2010 Handbook for Phase 1 Habitat Survey: a technique for environmental audit. JNCC, Peterborough.

[3] Clements, D. & Toft, R. (1992). *Hedgerow Evaluation and Grading System (HEGS) – a methodology for the ecological survey, evaluation and grading of hedgerows*. Countryside Planning and Management

[4] The Hedgerow Regulations 1997 – Statutory Instrument 1997 No. 1160. [Online]. London: HMSO. Available at: http://www.legislation.gov.uk/uksi/1997/1160/contents/made [Accessed 02/12/2014].

Adopted Plan:MK

2.8 Where relevant this report draws upon planning policies as detailed within the adopted Milton Keynes Plan, which relate to Protection of Sites (policy NE1), Protected Species and Priority Species and Habitats (policy NE2), Biodiversity and Geological Enhancement (NE3) and Green Infrastructure (NE4).

Limitations

2.8.1. The Extended Phase 1 habitat survey update was undertaken outside of the optimal survey period. Given the nature of the site, however, sufficient information has been obtained to identify broad habitats and any significant changes that may have occurred since previous assessment, both undertaken in the recommended season. Survey data obtained in 2021 has been supplemented by earlier data from the 2016 and 2018 surveys.

3.0 RESULTS

Desk Study

3.1 The locations of designated sites referred to in the following section are illustrated in Figure 6.1 of the accompanying ES chapter.

Statutory Designations

3.2 No statutory designated sites of international or national nature conservation importance were located within a 5km or 2km radius of the site, respectively.

Non-statutory Designations

3.3 A total of three non-statutory wildlife sites are located within 1km of the application site, consisting of a Local Wildlife Site (LWS) and two Milton Keynes Wildlife Corridors.

3.4 Tongwell Lake LWS is located approximately 75m north-west of the site. It has been designated as it is an important site for birds, and meets the criteria for lowland open waters and margins. It is also important for Odonata.

3.5 The Milton Keynes Wildlife Corridor Project (1996[5]) was initiated by Milton Keynes Borough Council after the concept of Wildlife Corridors was included in their Local Plan. Wildlife Corridors are given the same status as Milton Keynes Wildlife Sites (LWSs). They are linear pathways containing habitats that encourage the movement of plants and animals between important wildlife sites.

3.6 The 'M1 Motorway Wildlife Corridor' (c. 515.5ha) extends the length of the M1 within Buckinghamshire and includes verges and cuttings which immediately bound the road as well as adjacent habitats associated with the motorway including hedgerows, woodland and grassland. The section of Wildlife Corridor that falls within the boundary of the application site comprises a linear section of poor semi-improved grassland, interspersed with tall ruderal vegetation. The adjacent native species-poor hedgerow is located outside of the application site boundary (a full description of the on-site habitat is detailed in the Habitat / Flora section below). The boundary of the M1 Motorway Wildlife Corridor in relation to the application site is illustrated in Figure 6.2 of the accompanying ES chapter.

3.7 The River Ouzel forms a Milton Keynes Wetland Wildlife Corridor, located 500m east of the application site at its closest point. It includes the river itself and bordering habitats which include calcareous and neutral grassland (managed for hay), semi-improved pasture, recent plantations and amenity grassland.

Field Results

Habitats / Flora

3.8 The locations of the habitats referred to in the following sections can be found in Figure 6.3 of the accompanying ES chapter. Full botanical species lists are provided in Appendix A.

[5] The Wildlife Corridors of Milton Keynes (1996) A Report of the Milton Keynes Wildlife Corridors Project. Word Document

Broadleaved Plantation Woodland

3.9 Unmanaged broadleaved plantation woodland was located at the north-west and south-east boundary of the site as highway planting. The woodland canopy varied in structure although was generally to 15m in height with tree standards varying between semi-mature and to a lesser extent, mature specimens, with some self-set material present. The woodland as whole was in poor condition due to a lack of management. Tree species included crack willow *Salix fragilis*, white popular *Populus alba*, ash *Fraxinus excelsior*, oak *Quercus robur* and aspen *Populus tremula*. Small tree and shrub species included but were not limited to hawthorn *Crataegus monogyna* and elder *Sambucus nigra*. Bare ground was prominent and ground flora where present was limited, particularly where trees were closely set, with species such as lords-and-ladies *Arum maculatum*, common nettle *Urtica dioica*, ivy *Hedera helix* and cleavers *Galium aparine* all common.

Scrub – Scattered

3.10 Immature scattered scrub was located in the grassland habitat central to the site, the coverage being sporadic. Comprising species such as hawthorn and bramble *Rubus fruticosus*. Bramble was also found frequently within the highway verges, particularly where unmanaged, interspersed by self-set blackthorn *Prunus spinosa* and ash encroaching from the hedgerows.

Trees

3.11 A single mature ash standard was located at the south boundary of the grassland habitat. The tree appeared to be in a good condition with little signs of damage.

Species-poor Semi-Improved Grassland

3.12 Species-poor semi-improved grassland, created as part of the sites restoration, dominated the majority of the central field compartment, being mostly developed on substrate derived from or disturbed by quarry operations and now subject to ploughing as a form of management, with large areas being waterlogged during the survey in January 2021. The result was a generally varied sward dominated by course grasses and interspersed with ruderal species. Rough meadow-grass *Poa trivialis* was dominant across a large area with black-grass *Alopecurus myosuroides* and perennial rye-grass *Lolium perenne* occasional. Herbs were limited here to white clover *Trifolium repens* and creeping buttercup *Ranunculus repens*, both being locally frequently, although species such as bristly oxtongue *Helminthotheca echioides* and willowherb *Epilobium* sp. were also widespread.

3.13 Grassland at the peripheries of the compartment, particularly to the north-east, supported a varied sward, albeit still species-poor. Yorkshire-fog *Holcus lanatus* and rough meadow-grass were co-dominant with a range of other species including cock's-foot *Dactylis glomerata*, red fescue *Festuca rubra* and soft-brome *Bromus hordeaceus* which were all occasional to rare. The sward was found to support a small number of low-growing herbs including creeping buttercup, thyme-leaved speedwell *Veronica serpyllifolia,* lesser trefoil *Trifolium dubium* and white clover which were locally frequent. Taller herbs were characterised by occasional ribwort plantain *Plantago lanceolata* and scented mayweed *Matricaria recutita* with red campion *Silene dioica* and common poppy *Papaver rhoeas* also recorded. Where areas of bare ground were still abundant species such a field pansy *Viola arvensis*, lesser trefoil, white clover and parsley piert *Aphanes arvensis agg*. were present, although scattered.

3.14 Grassland at the western extent of the site (within the boundary of the M1 Motorway Wildlife Corridor) was typically defined by rough meadow-grass and Yorkshire-fog which were abundant. Annual meadow-grass *Poa annua* was also occasional. A number of common herbs, including field-speedwell *Veronica persica*, common mouse-ear *Cerastium fontanum* and spotted medick *Medicago arabica* were found to be rare. As per the wider site, tall ruderal species were frequent within this section of the grassland, and it was also subject to bramble encroachment from the adjacent hedgerow.

3.15 Grass verges present bordering the highway was generally unmanaged and comprised common species. Rough meadow-grass was generally dominant, whilst false oat-grass *Arrhenatherum elatius* and barren brome *Bromus sterilis* were locally frequent and perennial rye-grass and cock's-foot were occasional. Herbs typically included cleavers, white clover and red clover which were locally frequent whilst creeping cinquefoil and common daisy *Bellis perennis* were rare.

Tall Ruderal

3.16 Tall ruderals were a prominent but localised component of the central field compartment, characterised by bristly oxtongue, common nettle, broadleaved dock *Rumex obtusifolius*, curled dock *Rumex crispus*, spear thistle *Cirsium vulgare* and creeping thistle *Cirsium arvense* which were all occasional to frequent. Hemlock *Conium maculatum* was locally abundant within the grassland at a small number of locations.

3.17 Ruderal species characteristic of the section of the site located within the M1 Motorway Wildlife Corridor included hemlock, creeping thistle, spear thistle, prickly lettuce *Lactuca serriola*, willowherb and rosebay willowherb *Chamerion angustifolium* which ranged from occasional to locally occasional in abundance.

3.18 The verges bordering the highways comprised an abundance of tall ruderal vegetation, particularly associated with hedgerow bases. Cow parsley *Anthriscus sylvestris* and hogweed *Heracleum sphondylium* were frequent with bristly oxtongue and hemlock occasional.

Standing Water

3.19 The initial Phase 1 Habitat survey undertaken in 2016 highlighted several ephemeral pools and a number of trial pits within the site boundary, which were subject to aquatic great crested newt *Triturus cristatus* surveys during May 2016 (see Appendix 6.5 Great Crested Newt Report). Since this time, and as part of the on-going management of the site, the trial pits have been removed and much of these areas have become dry, or are no longer present. Some ephemeral standing water (10cm in depth) was still present within eastern sections of the site, where the ground was found to be waterlogged. Common reedmace *Typha latifolia* was the dominant species with yellow iris *Iris pseudacorus* occasional and clubrush *Schoenoplectus* sp. rare.

Arable

3.20 The western-most periphery of an arable field compartment fell within the boundary of the site, located east of Willen Road. The field margins were generally narrow to 0.5m wide, and in places were overgrown by bramble encroaching from the adjacent hedgerows. Where bramble was absent tall ruderal species were abundant characterised by hogweed and common nettle. Where herbs were present they included germander speedwell *Veronica chamaedrys*, common poppy, hedge woundwort *Stachys sylvatica*, field pansy and creeping cinquefoil *Potentilla reptans*.

Ephemeral/Short perennial

3.21 Habitats at the eastern extent of the site were characteristic of those subject to past disturbance comprising remnant sand and gravel deposits, as well as plateaus of bare ground, shallow ephemeral pools and bunds, all in varying stages of colonisation. Bunds dominated by coarse grass species, included rough meadow-grass, Yorkshire-fog and false oat-grass, and tall ruderal species such as bristly oxtongue. Localised herbs included white clover and creeping buttercup which were frequent and field forgot-me-knot *Myosotis arvensis* and common mouse-ear which were occasional. Greater plantain *Plantago major* and *cotoneaster* sp. were also locally occasional. Goat's-rue *Galega officinalis* was locally abundant on a single mound.

Hedgerows

3.22 The hedgerows bordering the central field compartment (H1, H4 and H5) appeared to be subject to low intensity management and were outgrowing into the field for the majority of their length. During recent survey of the site in January 2021 it was noted that three sections of hedgerow H1, totalling approximately 85m, had recently been removed to facilitate the M1 highway works. The remaining hedgerow sections were intact but unmanaged and dominated by bramble growing up and over the canopy.

3.23 Diversity was typically low with all hedgerows dominated by hawthorn with occasional elder and English elm *Ulmus procera*. The hedge bottom flora was largely ruderal in its composition although species typical of shaded habitats such lords-and-ladies and ground-ivy *Glechoma hederacea* were recorded. Three hedgerows (H2, H3 and H4) were ascribed with a high grade for HEGS (2, +2, or -1) nature conservation whilst the remaining hedgerows were ascribed grades of 3+, indicating moderate nature conservation value. A summary of each is provided in Table 5 below. No hedgerows were considered to be species-rich or of Importance under the Hedgerow Regulations. All hedgerows present comprised at least 80% native woody species and therefore qualify as NERC priority habitats.

Table 1: Hedgerow Species Composition and HEGS Grades

Hedgerow Number	Length (m)	Canopy Species	Species per 30m	Woodland Ground flora / Climbers	HEGS Score	REGS	Species-rich
H1	680	Hawthorn, elder	1.3	Hemlock, ground-ivy, cow parsley	3+	No	No
H2	250	Hawthorn, ash, elder, privet, dogwood	1.3	Common nettle, lords-and-ladies, ivy	2+	No	No
H3	75	Hawthorn, blackthorn, field maple, dogwood, English elm	2.6	Ground-ivy, Russian vine, lords-and-ladies	2+	No	No
H4	400	Hawthorn, elder	1.3	Lord & Ladies, dog rose, common nettle	2+	No	No

Hedgerow Number	Length (m)	Canopy Species	Species per 30m	Woodland Ground flora / Climbers	HEGS Score	REGS	Species-rich
H5	170	Hawthorn	1	Common nettle, ivy	3+	No	No

Ditch

3.24 An over shaded ditch was located at the south-east boundary of the central field compartment, in association with the base of H4. The path of the ditch continued south off-site where it linked with a culvert under the M1. The ditch contained localised pools of shallow water where celery-leaved buttercup *Ranunculus sceleratus* was noted. A second ditch was located at the north/north-west boundary of the central field compartment, in association with the base of H5. The ditch was dry and heavily overshaded by the hedgerow and broadleaved plantation woodland.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 The following section provides an evaluation of the existing habitats within and adjacent to the site boundary. A summary of recommendations for mitigation is also provided.

4.2 The full assessment of impacts to sites of nature conservation interest and habitats is detailed separately in the accompanying ES chapter. The evaluation has been made in the content of relevant statutory and policy protection.

Designated Nature Conservation Sites

Statutory Designation

4.3 No international or national sites of conservation importance were identified within a 5km or 2km radius of the site, respectively. Therefore the potential presence of these sites does not pose a constraint and no further recommendations or mitigation is considered necessary.

Non-Statutory Designation

4.4 Non-statutory designated sites do not receive statutory protection. They do however receive policy protection (as “Local Sites”), as reflected in the National Planning Policy Framework (NPPF). NPPF suggests that Local Sites can have a fundamental role to play in meeting overall national biodiversity targets and that appropriate weight should be attached to designated sites when making planning decisions.

Tongwell Lake LWS

4.5 There will be no direct loss to the habitats of Tongwell Lakes LWS. The LWS is located 75m north-west of the site, however it lies beyond the M1, and the open water habitat for which the site is designated is located 260m away, at its closest point. It is considered that any indirect impacts e.g. light and noise pollution will be limited by the presence of the motorway, the distance of the LWS from the development site and the buffering effect provided by the intervening habitats, including mature woodland and highway planting.

M1 Motorway Wildlife Corridor

4.6 The M1 Motorway Wildlife Corridor (a site which is given the same status as Milton Keynes Local Wildlife Sites) partially falls within the boundary of the western most extent of the application site. The corridor has been designated as it forms a linear pathway bordering the M1, containing habitats (verges and cuttings, hedgerows, woodland and grassland) that encourage the movement of plants and animals between important wildlife sites. The on-site habitats which fall within the boundary of wildlife corridor are limited to a poor semi-improved grassland, only with the adjacent native species-poor hedgerow located outside of the site boundary.

4.7 The M1 corridor falls under local policy NE1[6] which states that-

"Development proposals which would be likely to harm the biodiversity or geological conservation value of a site of countywide or local importance (including Wildlife Corridors) as shown on the Policies Map or will only be permitted where:

- the local development needs significantly outweigh the biodiversity or geological conservation value of the site; and, all reasonable possibilities for mitigation have been put in place; and
- compensatory provision in line with the mitigation hierarchy can be secured to ensure that the overall coherence of the site is protected and with the intent to achieve a net gain in biodiversity".

4.8 The significance of the proposals should be judged based on the nature of existing habitats and the overall size of the wider network. Approximately 3ha of on-site poor semi-improved grassland falls within the boundary of the wildlife corridor, of which up to 1ha (0.2% of the total Wildlife Corridor area) will be lost to facilitate the development proposals. The loss of the grassland at this location, which is considered to be floristically poor, will not undermine the functionality of the Wildlife Corridor, nor create any 'pinch-points' which could adversely affect its connectivity. The adjacent native species-poor hedgerow, considered to be of greater value as a foraging and commuting feature for fauna, and a Priority Habitat listed on the Buckinghamshire and Milton Keynes Biodiversity Action Plan[7] and a Habitat of Principal Importance (NERC Act, 2006), will be retained and enhanced as part of the proposals. Best practice measures will be adopted during on-site works to ensure that construction activities are undertaken in an environmentally responsible manner in regard to all retained, and adjacent, sections of the Wildlife Corridor.

4.9 Habitat enhancement measures will incorporate new native woodland and tree planting and pond and species-rich grassland creation, the specific details of which are included below. It is considered that the creation of these habitats, which are of by far greater value to wildlife, will enhance the existing hedgerow and strengthen the functionality and biodiversity of the wildlife corridor in the long-term by improving its role as connective habitat between the site and other habitats in the wider area.

Other Non-statutory Sites

4.10 The River Ouzel, a Milton Keynes Wetland Wildlife Corridor, is located approximately 500m to the east of the site boundary. Whilst the river will not be directly affected by the proposals, i.e. there will be no loss of habitat; wetland habitats are sensitive to a number of potential indirect impacts that may be created as a result of construction such as pollution and habitat degradation through

[6] Part of the Adopted Plan:MK Available at https://www.milton-keynes.gov.uk/planning-and-building/planning-policy/plan-mk

[7] Buckinghamshire and Milton Keynes Natural Environment Partnership (NEP), 2015 *Forward to 2020: Buckinghamshire and Milton Keynes Biodiversity Action Plan* [online] Available at: http://www.bucksmknep.co.uk/wp-content/uploads/2014/11/Bucks-BAP-Forward-to-2020.pdf [Accessed 31 January 2018]

dust deposition during construction. In order to avoid these potential impacts works will be undertaken in accordance with best working site practices and procedures will ensure the avoidance of accidental pollution / contamination incidents.

4.11 All other non-statutory sites are located over 1km from the site boundary and it is therefore considered that there would be no adverse effects on such sites as a result of these proposals, given the nature of the proposed development site, their distance from the site and the implementation of site management practices.

Habitats

4.12 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:

- Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in NPPF, or non-statutory site designation),
- Identification as a habitat of principal importance for biodiversity under Natural Environment and Rural Communities Act (NERC) 2006 and consequently identification as a Priority Habitat within the UK or local Biodiversity Action Plan (BAP).

4.13 Under the NPPF development should seek to contribute a net gain in biodiversity where possible.

Hedgerows

4.14 Hedgerows dominated by native species are classified as a Habitat of Principal Importance under Section 41 of the NERC Act 2006 and are listed as a Priority Habitat listed on the Buckinghamshire and Milton Keynes Biodiversity Action Plan. The hedgerow network across the site was generally intact with few gaps and provided commuting and foraging habitat for a variety of species. All hedgerows were assessed individually as being of moderate structure but of low species diversity, providing some foraging habitat and connectivity to the wider countryside for the fauna using the site. None were found to be species-rich or of sufficient diversity to qualify as LWS habitat.

4.15 Hedgerow H1 will be retained as part of the proposals, whilst all or part of the remaining hedgerows will be lost to facilitate highway works (hedgerow loss is further discussed within the accompanying ES chapter). It is however recommended that the loss of these hedgerows is compensated for by the provision of new species-rich hedgerows and tree planting within the final layout.

4.16 It is further recommended that retained hedgerow H1 is enhanced, via planting of native scrub species and native tree planting to improve its structure as wildlife corridors. All retained hedgerows will be protected by appropriate fencing based on their calculated Root Protection Areas (RPA) for the lifetime of the construction phase.

Broadleaved Plantation Woodland

4.17 Broadleaved plantation woodland was present bordering the highways in the south and north-west of the application site, for the majority comprising semi-mature and mature standards. Current proposals indicate that both parcels will remain un-impacted and therefore its loss does not pose a constraint to the proposals. All retained woodland should be protected by appropriate fencing for the duration of the development and subject to best practice construction methods.

4.18 New broadleaved woodland creation will be created along the west boundary of the site in conjunction with the M1 Wildlife Corridor to improve its structure and create a stronger wildlife corridor. Planting should be structure to create distinct canopy and understorey layers comprising native fruit and berry bearing species of value to wildlife.

Trees

4.19 Tree standards within the central field compartment were limited to a single mature ash at the south site boundary which is proposed to be retained. Current proposals include new tree planting at the site boundaries, particularly to the north and east, in addition to bordering car parking, access and drainage ponds. All trees should comprise native species of local provenance and/or ornamental species that have proven benefit to wildlife.

4.20 The retained tree will be protected from damage and from soil compaction during works by maintaining RPAs, as per detailed within the Arboricultural report. Protection measures should include consideration of BS5837 *Trees in Relation to Construction - Recommendations: 2012 for trees and hedges*.

Grassland

4.21 Poor semi-improved grassland dominated the majority of the site, consisting of common and widespread species representative of species-poor habitat types that are likely to be common in the surrounding landscape and therefore of limited ecological interest. None of the plant communities associated with the highway verges were considered to be of sufficient diversity to qualify as Habitat of Principal Importance, BAP Priority Habitat or LWS habitat, and it is likely that similar communities are associated with the road verges in the surrounding area.

4.22 Proposed grassland creation to be incorporated within the final scheme should comprise species-rich grassland characteristic of the local area.

Standing Water

4.23 Standing water within the boundary of the site comprised ephemeral pools commonly found within land prone to waterlogging. A number of trial pits holding water initially recorded in 2016 no longer exist due to on-going management of the site. The nature of the ephemeral waterbodies is such that their value to wildlife is considered to be extremely limited and their loss will not pose a constraint to the proposals.

4.24 Proposed open water habitats within the M1 Wildlife Corridor, along the northern and southern boundary and scattered between buildings will greatly enhance the site's biodiversity post-development. It is recommended that all basins are able to accommodate an area of permanent water and planted with a range of native wetland plants. The sustainable drainage basin located within land east of Willen Road, will also feature a section of permanent open water and associated wetland habitat.

Arable

4.25 Arable habitat located within the site boundary is typical of similar species-poor and intensively managed habitats in the surrounding area and it does not represent a Habitat of Principal Importance under Section 41 of the NERC Act 2006. Therefore, on this basis it is considered to be of limited ecological interest and its loss will not pose a constraint.

Ephemeral/Short Perennial

4.26 Bare ground at varying stages of colonisation was present at the eastern extent of the central field compartment, comprising species-poor habitat of limited botanical value. The loss of this area will not pose a constraint to the proposals.

Other Habitats

4.27 The remaining habitats, including the tall ruderal and scattered scrub grassland were widespread and species-poor habitat types that were considered to be of limited ecological value.

Recommendations / Biodiversity Enhancements

4.28 Opportunities for biodiversity gain are present throughout the proposed scheme, especially in conjunction with the western periphery with the existing M1 Motorway Wildlife Corridor which will form a green corridor comprising a mosaic of native habitats.

4.29 Native broadleaved woodland planting should comprise species characteristic of the local area, managed to create a varied structure of canopy, understorey and a rich ground flora with specific features such as standing deadwood and log piles of benefit to invertebrates and small mammals. A series of attenuation basins and ponds will be provided within this area which should incorporate marginal and aquatic planting with open water and shallow margins. Where designed to only be seasonally wet species-rich grass mixes such as Emorsgate EM8 – Meadow Mixture[8] are recommended.

4.30 It is recommended that open areas are incorporated into the final layout which could comprise species-rich grassland of a local provenance / character to be managed for its biodiversity value. The inclusion of night scented species such as evening primrose *Oenothera biennis,* yarrow and selfheal will attract night flying insects and in turn foraging bats and birds.

[8] https://wildseed.co.uk/mixtures/view/9

Appendix A: Botanical Species List

Scientific name	Common name	Trees / Hedgerows	Plantation Woodland	SI Grassland	Ruderal	Arable	Bare Ground
Annual Beard-grass	*Polypogon monspeliensis*						LF
Annual Meadow-grass	*Poa annua*			O			
Apple	*Malus domestica*	R					
Ash	*Fraxinus excelsior*	O	F				
Aspen	*Populus tremula*		R				
Barren Brome	*Bromus sterilis*			LF			
Birch	*Betula* sp.	R					
Black-grass	*Alopecurus myosuroides*			O			
Bramble	*Rubus fruticosus* agg.		LF	O			
Blackthorn	*Prunus spinosa*	O					
Bristly Oxtongue	*Picris echioides*			O	O / LD		F / A
Broad-leaved Dock	*Rumex obtusifolius*				O		
Buckler-fern	*Dryopteris* sp.			R			
Bulrush	*Typha latifolia*						LO
Cat's-ear	*Hypochaeris glabra x radicata (H. x intermedia)*			R			
Cleavers	*Galium aparine*		O			O	
Cock's-foot	*Dactylis glomerata*			O			
Common Bird's-foot-trefoil	*Lotus corniculatus*			LF			
Common Club-rush	*Schoenoplectus lacustris*						R

Common Daisy	*Bellis perennis*			R			
Common Field-speedwell	*Veronica persica*			R			
Common Knapweed	*Centaurea nigra*			LF			
Common Mouse-ear	*Cerastium fontanum*			R		O	
Common Nettle	*Urtica dioica*				O	LF	
Common Poppy	*Papaver rhoeas*			R		R	
Common Vetch	*Vicia sativa*			R			
Cotoneaster	*Cotoneaster* sp.						LO
Cow Parsley	*Anthriscus sylvestris*				F		
Crack Willow	*Salix fragilis*		O				
Creeping Buttercup	*Ranunculus repens*			LF			LF
Creeping Cinquefoil	*Potentilla reptans*			R		LF	
Creeping Thistle	*Cirsium arvense*				O		
Crested Dog's-tail	*Cynosurus cristatus*			LO			
Curled Dock	*Rumex crispus*			O			
Cut-leaved Crane's-bill	*Geranium dissectum*			R			
Dandelion	*Taraxacum officinale* agg.			R			
Dogwood	*Cornus sanguinea*	R					
Elder	*Sambucus nigra*	R / O	F				
English Elm	*Ulmus procera*	LF					
False Oat-grass	*Arrhenatherum elatius*			LF			F
Field Forget-me-not	*Myosotis arvensis*			R			
Field Pansy	*Viola arvensis*			O		R	
Germander Speedwell	*Veronica chamaedrys*					R / LO	

Goat's-rue	*Galega officinalis*						LA
Greater Plantain	*Plantago major*						LO
Ground-ivy	*Glechoma hederacea*	O					
Hawthorn	*Crataegus monogyna*	D	O				
Hedge Woundwort	*Stachys sylvatica*					R	
Hemlock	*Conium maculatum*				O / LA		
Hogweed	*Heracleum sphondylium*				F	F	
Horse-chestnut	*Aesculus hippocastanum*	R					
Ivy	*Hedera helix*		F				
Lesser Trefoil	*Trifolium dubium*			LF / F			
Lords-and-ladies	*Arum maculatum*		R				
Parsley Piert	*Aphanes arvensis* agg.			F			
Pedunculate Oak	*Quercus robur*		O				
Perennial Rye-grass	*Lolium perenne*			O			
Prickly Lettuce	*Lactuca serriola*				LO		
Prickly Sow-thistle	*Sonchus asper*			R			O
Red Campion	*Silene dioica*			R			
Red Clover	*Trifolium pratense*			LF			
Red Fescue	*Festuca rubra* agg.			O			
Ribwort Plantain	*Plantago lanceolata*			O / R			
Rosebay Willowherb	*Chamerion angustifolium*				LO		
Rough Meadow-grass	*Poa trivialis*			D			F
Rowan	*Sorbus aucuparia*	R					
Scented Mayweed	*Matricaria recutita*			LO / LF			

Selfheal	*Prunella vulgaris*			R / O			
Soft-brome	*Bromus hordeaceus*			LF			
Spear Thistle	*Cirsium vulgare*				O		
Spotted Medick	*Medicago arabica*			R			
Thyme-leaved Speedwell	*Veronica serpyllifolia*			LF			
White Clover	*Trifolium repens*			LF			O / LF
White Poplar	*Populus alba*		R				
Willowherb	*Epilobium* sp.			O			
Yarrow	*Achillea millefolium*			O			
Yellow Iris	*Iris pseudacorus*						O
Yorkshire-fog	*Holcus lanatus*			D			F