

**Emm Brook
Woosehill
Wokingham
Berkshire
RG41 3DA**

Extended Phase 1 Ecological Survey
Ref: R2207/c

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**JOHN WENMAN**
ecological consultancy

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1 SUMMARY

- 1.1.1** John Wenman Ecological Consultancy LLP was commissioned by the South East Rivers Trust to undertake an Extended Phase 1 Habitat Survey of the Emm Brook at Woosehill Meadows in Wokingham. The survey was commissioned in relation to the Woosehill Fish Passage Improvements project led by the South East Rivers Trust (SERT) with the support of the Environment Agency (EA).
- 1.1.2** The site forms part of the amenity parkland known as 'Woosehill Meadows' to the east of Morrisons supermarket in Woosehill, Wokingham (OS grid reference: SU 79824 69269). The site is used by the local community as a recreational area and as such consists of large areas of amenity grassland and woodland. The current (modified) channel of the Emm Brook spanned the western side of the site with a weir in the woodland to the north. The paleo channel of the Emm Brook ran along the edge of the southern woodland, to the east of the main channel, before rejoining the river to the north of the site. A section of the paleo channel had been excavated to create a pond in the centre of the site and scattered trees lined the banks of the channels in proximity to the open amenity areas.
- 1.1.3** A search of data held by Thames Valley Environmental Records Centre (TVERC) for land within a 2km radius has shown the site is not statutorily or non-statutorily designated for its wildlife interest and therefore not recognised as being of international, national or county level wildlife importance. However, the Emm Brook and the broadleaved woodland on site are classified as a Habitats of Principal Importance for conservation (HPI) as defined under the NERC Act 2006 and therefore of local conservation importance within the borough.
- 1.1.4** During the site walkover, a large extent of the site comprised amenity grassland supporting common and widespread plant species of negligible ecological value. The scattered trees and bramble scrub bordering the Emm Brook had ecological value at the site level with the potential to support a range of riparian and woodland species.

1.1.5 Proposed mitigation measures and recommendations have been outlined including:

- Creation of a replacement pond;
- Planting of willow and hazel coppice to compensate for the loss of some understorey clearance along the channel;
- Ground level inspection of trees proposed for removal to determine the potential for roosting bats;
- Further survey of the ponds and paleo channel to determine the presence or likely absence of great crested newts;
- Precautionary mitigation measures for amphibians and reptiles during tree/vegetation clearance and sediment excavation;
- Any tree or dense bramble removal required should be completed outside of peak bird nesting season or following an inspection by an ecologist confirming an absence of nesting activity; and
- Any clearance of deadwood or removal of large woody material should be completed with an ecologist present to assist in careful translocation of stag beetle larvae or sheltering amphibians or reptiles if present.

1.1.6 The proposals present opportunities for ecological enhancements in order to achieve a net gain in biodiversity value on site such as:

- Grassland enhancement through plug planting and late cutting regime;
- Re-profiling and planting of flood relief channel (current modified channel) to create a wetland area on site;
- Provision of bat and bird boxes in the woodland; and
- Creation of stag beetle habitat by digging logs into the ground and positioning them vertically.

2 INTRODUCTION

2.1 Overview

2.1.1 John Wenman Ecological Consultancy LLP was commissioned by Toby Hull of the South East Rivers Trust to undertake an Extended Phase 1 Habitat Survey of the Emm Brook at Woosehill Meadows in Wokingham.

2.1.2 The survey was commissioned in relation to the Woosehill Fish Passage Improvements project led by the South East Rivers Trust (SERT) with the support of the Environment Agency (EA). The main aim of the project is to reconnect the Emm Brook paleo channel in order to by-pass the weir and restore fish passage. The modified channel would act as a flood relief channel.

2.1.3 The Greenways Project is in progress aiming to create a traffic-free multi-user route connecting the new Arborfield Garrison development to the Finchampstead Baptiste Centre via California Country Park (now completed) and to North Wokingham via Woosehill (consultation has closed and the route is in planning stages). This will involve the construction of a multi-use path through Woosehill Meadows and therefore all proposals relating to the fish passage improvement scheme will need to consider this proposed route.

2.2 Site Location and Context

2.2.1 The site is part of the amenity parkland known as 'Woosehill Meadows' to the east of Morrisons supermarket in Woosehill, Wokingham (OS grid reference: SU 79824 69269).

2.2.2 The Emm Brook river runs through Woosehill Meadows in the centre of the Wokingham suburb of Woosehill. The wider extent of Woosehill Meadows includes open fields and woodland to the south of the site. The Woosehill Spine Road borders the northwest of the site and the Reading Road (A329) is to the north. A railway line bordered by established woodland lies approximately 210 metres to the northeast and connects to Holt Copse and Joel Park Local Nature Reserve (LNR) approximately 400 metres to the east of the site. Approximately 235 metres to the west, lies a small lake with wooded banks called Windmill Pond.

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2.2.3 Overall, the surrounding area offers pockets of habitat suitable for use by a range of fauna adapted to suburban environments.

2.3 Report format

2.3.1 There follows: an overview of the planning policy background in Section 3 and of the protected species legislation in Section 4; details of the survey methods in Section 5; background data search findings in Section 6; Phase 1 habitat survey findings in Section 7; and a discussion of the survey findings in Section 8. The appendices present: site photographs (**Appendix 1**); a Phase 1 habitat survey plan with associated target notes (**Appendix 2**); and a plant species list recorded during the survey (**Appendix 3**).

3 PLANNING POLICY BACKGROUND

3.1 National Planning Policy

3.1.1 The ODPM Circular 06/2005 provides guidance on the application of the law relating to planning and nature conservation stating that *'the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.'*

3.1.2 The revised National Planning Policy Framework (NPPF), published in July 2018, sets out the Government's planning policies for England and how they should be applied. Section 15 of the NPPF sets out the approach local authorities should adopt to conserve and enhancing the natural environment when preparing planning policy and when considering planning applications. Paragraph 175 sets out the principles local authorities should apply when determining planning applications as follows:

175. When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁵⁸ and a suitable compensation strategy exists; and*

- d) *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

3.2 Local Planning Policy

3.2.1 Wokingham Borough Council currently has in place a Core Strategy Development Plan Document (DPD), adopted in January 2010. The Core Strategy DPD sets out the long term 'spatial vision' for the Wokingham Borough up until March 2026. The emerging Local Plan Update document will refine the current Core Strategy from 2006 to 2026 to provide the strategy for the Borough from April 2013 to March 2036 and it is expected to be completed ('adopted') in Spring 2022.

3.2.2 Policy CP7 of the Core Strategy DPD provides guidance on how biodiversity should be considered as part of development. The Policy states:

'Sites designated as of importance for nature conservation at an international or national level will be conserved and enhanced and inappropriate development will be resisted. The degree of protection given will be appropriate to the status of the site in terms of its international or national importance. Development:

A) Which may harm county designated sites (Local Wildlife Sites in Berkshire), whether directly or indirectly, or

B) Which may harm habitats or, species of principle importance in England for nature conservation, veteran trees or features of the landscape that are of major importance for wild flora and fauna (including wildlife and river corridors), whether directly or indirectly, or

C) That compromises the implementation of the national, regional, county and local biodiversity action plans will be only permitted if it has been clearly demonstrated that the need for the proposal outweighs the need to safeguard the nature conservation importance, that no alternative site that would result in less or no harm is available which will meet the need, and:

- i) Mitigation measures can be put in place to prevent damaging impacts; or*
- ii) Appropriate compensation measures to offset the scale and kind of losses are provided.'*

Areas of Wokingham Borough fall within the nationally designated Thames Basin Heath Special Protection Area (SPA) and the Thames Basin Heath SPA Impact Avoidance Strategy document (adopted July 2009 and updated in April 2010) provides guidance on the information required by Wokingham Borough Council in order to assess the impact of development on the SPA and consider how negative impacts of residential development on a SPA for rare birds will be avoided and mitigated.

4 LEGISLATIVE BACKGROUND – PROTECTED SPECIES

4.1 Amphibians

4.1.1 The seven native species of amphibian receive protection under the Wildlife & Countryside Act 1981 (as amended). The four widespread and common amphibians (common frog, toad, smooth and palmate newts) receive limited protection – making their sale illegal.

4.1.2 Of the seven native amphibian species, the widespread great crested newt receives full protection under the Wildlife & Countryside Act 1981 (as amended) and under the Conservation of Species and Habitats Regulations 2017 ('Habitat Regulations') (as amended). These make it illegal to:

- Intentionally or recklessly kill, injure or take a great crested newt;
- Possess or control any live or dead specimen or anything derived from a great crested newt;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt;
- Intentionally or recklessly disturb great crested newts; in particular, any disturbance which is likely to impair their ability to survive, breed or reproduce or nurture their young; or in the case of hibernating or migrating animals, to hibernate or migrate.

4.1.3 The great crested newt and common toad are listed as being of principal importance for the conservation of biodiversity in England (SPI), under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, (commonly referred to as a UK Priority Species).

4.2 Reptiles

4.2.1 The four widespread reptiles most likely to be encountered (adder, grass snake, slow worm and viviparous lizard) are protected under the Wildlife & Countryside Act 1981 (as amended). The Act makes it an offence to intentionally kill, injure, possess or sell any of the species.

4.2.2 The four reptile species are listed as being of principal importance for the conservation of biodiversity in England, under Section 41 of the Natural

Environment and Rural Communities Act 2006, (commonly referred to as a UK Priority Species).

4.3 Birds

4.3.1 All wild birds are protected under the Wildlife & Countryside Act 1981 (as amended). The Act makes it an offence to kill, injure or take a wild bird or to damage or destroy the nest of a wild bird whilst in use or being built.

4.3.2 Less common bird species of conservation concern, such as the barn owl and kingfisher, are listed on Schedule 1 of the Act, which makes it an offence to disturb the birds whilst nesting also.

4.4 Bats

4.4.1 All British bat species are fully protected by the Wildlife & Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017 ('Habitat Regulations'). In summary, the legislation combined makes it an offence to:

- Damage or destroy a breeding site or resting place or intentionally or recklessly obstruct access to a structure or place used for shelter by a bat;
- Deliberately, intentionally or recklessly disturb bats; in particular any disturbance which is likely to impair the ability of bats to survive, breed or reproduce or nurture their young; or in the case of hibernating or migrating bats, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species;
- Deliberately kill, injure or take any bat.

4.5 Badgers

4.5.1 Badgers are protected by the Protection of Badgers Act 1992. The Act makes activities such as development that would harm or disturb badgers or damage, obstruct or destroy their setts illegal. If badgers are to be affected by the proposed development, activities can be undertaken only under a licence issued by Natural England. The issue of a licence would be subject to the development of a suitable mitigation strategy.

4.6 Otters

4.6.1 Otters are fully protected by the Wildlife & Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017 ('Habitat Regulations'). In summary, the legislation combined makes it an offence to:

- Damage or destroy a breeding site or resting place or intentionally or recklessly obstruct access to a structure or place used for shelter by an otter;
- Deliberately, intentionally or recklessly disturb otters; in particular any disturbance which is likely to impair the ability of otters to survive, breed or reproduce or nurture their young; or to affect significantly the local distribution or abundance of the species;
- Deliberately kill, injure or take any otter.

4.7 Hazel Dormice

4.7.1 Hazel dormice receive full protection under the Wildlife & Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017 ('Habitat Regulations') (as amended). These make it illegal to

- Intentionally or recklessly kill, injure or take a dormouse;
- Possess or control any live or dead specimen or anything derived from a dormouse;
- Damage or destroy a breeding site or resting place or intentionally or recklessly obstruct access to a structure or place used for shelter by a dormouse;
- Intentionally or recklessly disturb dormice; in particular any disturbance which is likely to impair their ability to survive, breed or reproduce or nurture their young; or in the case of hibernating or migrating animals, to hibernate or migrate.

4.7.2 The government's statutory conservation advisory organisation, Natural England, is responsible for issuing European Protected Species licences that would permit activities that would otherwise lead to an infringement of

the Habitat Regulations. A licence can be issued if the following three tests have been met:

- **Regulation 55(9)(a)** - there is “no satisfactory alternative” to the derogation, and;
- **Regulation 55(9)(b)** - the derogation “will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range” and;
- **Regulation 55(2)(e)** - the derogation is for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment”.

4.7.3 Local authorities have a statutory duty under Regulation 7(3e) of the Habitat Regulations to have regard to requirements of the Habitats Directive in the exercise of their functions. The Council must therefore consider and determine whether these three tests are likely to be satisfied by an application affecting European protected species before granting planning permission. **N.B. the requirements set out in 4.7.2 and 4.7.3 apply to development that would affect bats, great crested newts and otters, which are European Protected Species also.**

4.8 Water Voles

4.8.1 Since April 2008, water voles have received full protection under Section 9 of the Wildlife & Countryside Act 1981 (as amended). This makes it an offence to intentionally kill, injure or take water voles or to possess or control live or dead water voles or derivatives. It is an offence to intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.

4.8.2 The water vole is listed as being of principal importance for the conservation of biodiversity in England (SPI), under Section 41 of the Natural Environment and Rural Communities Act 2006, (commonly referred to as a UK Priority species).

4.9 Invasive Non-Native Plants

4.9.1 The Wildlife and Countryside Act 1981 (as amended) provides the primary controls on the release of non-native species into the wild in Great Britain. It is an offence under section 14(2) of the Act to 'plant or otherwise cause to grow in the wild' any plant listed in Schedule 9, Part II. The species listed in the Act includes Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and himalayan balsam (*Impatiens glandulifera*).

4.10 Injurious Weeds

4.10.1 Five native plants are listed as injurious weeds under the Weeds Act 1959: common ragwort (*Senecio jacobaea*), spear thistle (*Cirsium vulgare*), creeping or field thistle (*Cirsium arvense*), broad-leaved dock (*Rumex obtusifolius*) and curled dock (*Rumex Crispus*). The Act means it is not an offence to have these weeds growing on your land and species such as ragwort have significant conservation benefits. However, they must not be allowed to spread to agricultural land, particularly grazing areas or land which is used to produce conserved forage. Enforcement notices can be issued following complaints requiring landowners to take action to prevent the spread of these weeds.

4.11 Wild Mammals

4.11.1 Under the Wild Mammals (Protection) Act 1996 it is an offence to intentionally inflict unnecessary suffering, as specified by the Act, on any wild mammal.

5 SURVEY METHODS

5.1 Phase 1 Habitat Survey

5.1.1 An ecological walkover survey was undertaken on the 21st March 2019, by a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) supported by an assistant ecologist. During the survey, the habitats present were noted and plotted on a site plan (**Appendix 2**) using definitions based on the standard Phase 1 Habitat survey definitions (JNCC 2010). Key features of the site were photographed (**Appendix 1**) and plotted on the site plan using target notes (**Appendix 2**).

5.1.2 Any features of ecological importance were recorded, and plant species observed during the survey noted (**Appendix 3**). Particular attention was given to any evidence of the presence of protected species and the site's potential to support such species and those of species of principal importance for conservation (SPI) (as defined under Section 41 of the NERC Act 2006).

5.1.3 A meeting with Wokingham Borough Council's Ecology Officer was arranged to discuss and establish suitable mitigation and enhancement opportunities that are feasible within the management of the Woosehill site with the principle aims of benefiting both the ecological and amenity value of the site. Consideration of the points raised at the meeting has been incorporated into the recommendations in Section 9.

5.2 Background Data Search

5.2.1 Thames Valley Environmental Records Centre (TVERC) was commissioned to undertake a search of pre-existing records of protected and/or notable species and statutorily and non-statutorily designated wildlife sites held by them for the site and land within a 2km radius search area.

5.2.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website was referred to for pre-existing data on Habitats of Principal Importance (HPI) (as defined under Section 41 of the NERC Act 2006) and to understand the nature of surrounding habitats.

5.3 Survey Constraints

- 5.3.1** Full access was available to the site and therefore there were no significant access constraints to the walkover survey findings. The survey was subject to seasonal constraints; not all plant and animal species are visible throughout the year and therefore the report represents a snapshot of the site at the time of the survey only. The plant species list presented should not be considered a comprehensive list of species present.

6 BACKGROUND DATA SEARCH FINDINGS

- 6.1.1** The search of data held by TVERC and MAGIC shows that the survey site is not statutorily or non-statutorily designated for its wildlife interest. However, one statutorily designated site does fall within a 2km radius of the site: Holt Copse and Joel Park Local Nature Reserve (LNR) is approximately 400 metres to the east.
- 6.1.2** There are three Local Wildlife Sites (LWS) – non-statutorily designated sites of conservation interest in Berkshire – within the 2km radius of the site. Holt Copse LWS forms part of the LNR and is designated for its ancient semi-natural woodland. Bearwood Estate – Woods and Lakes LWS sits approximately 900 metres to the west of the site and 1240 metres to the south is Bottle Copse LWS.
- 6.1.3** One amphibian species has been recorded within the 2km radius of the site within the last 10 years: great crested newt (GCN; *Triturus cristatus*). GCN eggs were recorded in the Wokingham Millennium Arboretum Pond (approximately 1200 metres north) on three separate occasions in 2012 and fourteen adults were recorded in 2010.
- 6.1.4** Three reptile species have been recorded within the 2km radius of the site within the last 10 years: common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*). The closest records are of adult and juvenile slow-worms at 195A-199 Reading Road, approximately 750 metres to the northwest of the site, in 2010.
- 6.1.5** The data held by TVERC includes a range of protected and notable bird species records within the 2km search radius of the site. Birds recorded that are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) include: red kite (*Milvus milvus*), hobby (*Falco subbuteo*), green sandpiper (*Tringa ochropus*), barn owl (*Tyto alba*), kingfisher (*Alcedo atthis*), fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*) and brambling (*Fringilla montifringilla*). Species recorded that are on the Birds of Conservation Concern (BOCC) Red list include: yellow wagtail (*Motacilla flava*), grey wagtail (*Motacilla cinerea*), spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*), lesser redpoll (*Acanthis cabaret*), linnet (*Linaria cannabina*) and yellowhammer (*Emberiza citrinella*).

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- 6.1.6** At least seven bat species have been recorded within the 2km search area (in the last 10 years): serotine (*Eptesicus serotinus*), Natterer's bat (*Myotis nattereri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), brown long-eared bat (*Plecotus auritus*) and noctule (*Nyctalus noctula*). The records for notable and/or protected terrestrial mammals (excluding bats) held include: west European hedgehog (*Erinaceus europaeus*) – an SPI – and Eurasian badger (*Meles meles*).
- 6.1.7** There are a number of electrofishing records from the Environment Agency - dating from 2010 to 2013 - of Bullhead (*Cottus gobio*) on the Emm Brook to the north and south of the site,
- 6.1.8** The invertebrate records within the search area in the last 10 years include: stag beetle (*Lucanus cervus*) – a SPI; and the notable *Attactagenus plumbeus* and large fruit bark beetle (*Scolytus mali*).

7 PHASE 1 HABITAT SURVEY FINDINGS

7.1 Site Overview

7.1.1 The site is used by the local community as a recreational area and as such consists of large areas of amenity grassland and woodland. The main (modified) channel of the Emm Brook spanned the western side of the site with a weir in the woodland to the north. The paleo channel of the Emm Brook ran along the edge of the southern woodland, to the east of the main channel, before rejoining the river in the north of the site. A section of the paleo channel had been excavated by the Friends of Emm Brook to create a pond in the centre of the site, and scattered trees and scrub lined the banks of the channels in proximity to the open amenity areas.

7.1.2 The following Phase 1 habitat types were observed during the survey: mesotrophic running water, mesotrophic standing water, amenity grassland, semi-natural broadleaved woodland and scattered broadleaved trees.

7.1.3 The habitat types are detailed below; the site photographs are in **Appendix 1**, their distribution is shown on the site plan with associated target notes with detailed species compositions are described in **Appendix 2**, and a list of species recorded in **Appendix 3**.

Running water – mesotrophic (RWM1 & RWM2; TN1)

7.1.4 The Emm Brook spanned the western side of the site and exhibited a straight, modified channel lacking in established marginal or submerged vegetation (**Photograph 1; RWM1**). The channel had an approximate maximum width of 2.5m and a range of 15-30cm in depth. The vegetation growing on its banks included common woodland species such as lesser celandine (*Ranunculus ficaria*), ivy (*Hedera helix*), cleavers (*Galium aparine*) and dock (*Rumex* sp.). The weir was situated near the Woosehill Spine Road to the north of the site and formed a pool within the woodland (**Photograph 2; TN1**). A foul pipe was situated in the south of the site and also acted as a weir in the channel (**TN2**).

7.1.5 The paleo channel of the Emm Brook meandered through the woodland and parkland to the east of the main channel (**Photograph 3; RWM2**). The channel had a variety of marginal and submerged vegetation, including:

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marsh marigold (*Caltha palustris*), floating sweet-grass (*Glyceria fluitans*), grey sedge (*Carex divulsa*), hemlock water-dropwort (*Oenanthe crocata*), reed canary-grass (*Phalaris arundinacea*), borage (*Borago officinalis*), water mint (*Mentha aquatica*) and remote sedge (*Carex remota*). A raised foul pipe crossed the channel in the woodland to the north of the site (**Photograph 4; TN3**), and just south of this, two large fallen tree trunks lay across the channel (large woody material).

Standing water – mesotrophic (SWM1)

- 7.1.6** A section of the paleo channel had been excavated to create a pond in the centre of the site (**Photograph 5; SWM1**). The pond had marginal vegetation including: marsh marigold (*Caltha palustris*), water mint (*Mentha aquatica*), hard rush (*Juncus inflexus*), common reed (*Phragmites australis*), hemlock water-dropwort (*Oenanthe crocata*), *Iris* sp. and floating sweet-grass (*Glyceria fluitans*). The grassland along the western side of the pond had a greater variety of species (likely from seeding) than the surrounding amenity land (**TN4**), such as: black knapweed (*Centaurea nigra*), grape hyacinth (*Muscari* sp.), oxeye daisy (*Leucanthemum vulgare*), yarrow (*Achillea millefolium*) and willowherb (*Epilobium* sp.). Two alder trees (*Alnus glutinosa*) stood either side of the path next to the pond (crossing the paleo channel) possessing potential bat roost features behind thick stems of cut ivy (*Hedera helix*) (**Photograph 6; TN5**).

Amenity grassland (AM1)

- 7.1.7** Large areas of the site consisted of amenity grassland (**Photograph 7; AM1**) defined by abundant perennial ryegrass (*Lolium perenne*) and frequent cock's-foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*). The plant community also comprised occasionally distributed species, including: dandelion (*Taraxacum* agg.), cow parsley (*Anthriscus sylvestris*), common hogweed (*Heracleum sphondylium*), greater plantain (*Plantago major*), creeping buttercup (*Ranunculus repens*), dock (*Rumex* sp.), common ragwort (*Senecio jacobaea*) and white clover (*Trifolium repens*).

Semi-natural broadleaved woodland (BW1 & BW2)

- 7.1.8** There was a parcel of semi-natural broadleaved woodland in the south of the site (**Photograph 8; BW1**) with a tree and shrub assemblage comprising

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abundant willow (*Salix* sp.); occasional alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*). There were several large poplar (*Populus* sp.) specimens that likely originated from planting and the eastern edge of the woodland was dominated by dense blackthorn (*Prunus spinosa*). The ground flora consisted of bramble (*Rubus fruticosus* agg.), meadowsweet (*Filipendula ulmaria*), lords-and-ladies (*Arum maculatum*), cleavers (*Galium aparine*), wood avens (*Geum urbanum*) and common nettle (*Urtica dioica*).

- 7.1.9** A parcel of semi-natural broadleaved woodland grew in the north of the site (**Photograph 9; BW2**) with a tree assemblage comprising frequent alder (*Alnus glutinosa*), occasionally distributed species such as holly (*Ilex aquifolium*), pedunculate oak (*Quercus robur*), willow (*Salix* sp.), yew (*Taxus baccata*) and elm (*Ulmus* sp.), and locally-frequent poplar (*Populus* sp.). There was an elder (*Sambucus nigra*) understorey with ground flora consisting of occasional lesser celandine (*Ranunculus ficaria*), cleavers (*Galium aparine*), wood avens (*Geum urbanum*), ivy (*Hedera helix*), ground-elder (*Aegopodium podagraria*), common nettle (*Urtica dioica*), bramble (*Rubus fruticosus* agg.), lords-and-ladies (*Arum maculatum*) and ground-ivy (*Glechoma hederacea*).

Scattered broadleaved trees (SBW1 & SBW2)

- 7.1.10** The paleo channel of the Emm Brook had scattered broadleaved trees and bramble (*Rubus fruticosus* agg.) scrub lining its banks in the centre of the site (**Photograph 10; SBW1**), to the north of the pond. The scattered tree and shrub assemblage consisted of frequent alder (*Alnus glutinosa*), occasional elder (*Sambucus nigra*) and rare hazel (*Corylus avellana*). There was a large, mature oak tree with thick ivy (and potential other features) offering potential opportunities to roosting bats (**Photograph 11; TN6**).
- 7.1.11** The main channel of the Emm Brook had scattered broadleaved trees lining its banks from the southern survey boundary up to the woodland in the north of the site (**Photograph 12; SBW2**). The tree and shrub species present, included occasional hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), willow (*Salix* sp.) and elder (*Sambucus nigra*). The bankside vegetation comprised frequent cleavers (*Galium aparine*) and bramble (*Rubus fruticosus* agg.). occasional

meadowsweet (*Filipendula ulmaria*), common nettle (*Urtica dioica*) and hemlock water-dropwort (*Oenanthe crocata*). A group of planted, semi-mature hornbeam (*Carpinus betulus*) grew in the grassland on the western side of the channel.

Incidental fauna

- 7.1.12** During the survey, incidental bird sightings were recorded which included: great spotted woodpecker (*Dendrocopos major*), wren (*Troglodytes troglodytes*), chiffchaff (*Phylloscopus collybita*), great tit (*Parus major*), blackbird (*Turdus merula*), robin (*Erithacus rubecula*), wood pigeon (*Columba palumbus*), buzzard (*Buteo buteo*) and red kite (*Milvus milvus*).

8 DISCUSSION

8.1 Assessment of Existing Ecological Value

Habitats

- 8.1.1** The pre-existing data has shown the site is not statutorily or non-statutorily designated for its wildlife interest and therefore not recognised as being of international, national or county level wildlife importance. However, the Emm Brook and the broadleaved woodland on site are classified as a Habitats of Principal Importance for conservation (HPI) as defined under the NERC Act 2006 and therefore of local conservation importance within the borough.
- 8.1.2** A large extent of the site comprised amenity grassland with a plant community supporting relatively low numbers of native grassland and herbaceous species, typical of regularly mown recreational areas. These managed open areas lack the structural and species diversity to support a rich assemblage of flora and fauna and thus are considered to be of negligible ecological value.
- 8.1.3** The scattered trees and scrub bordering the Emm Brook had ecological value at the site level with the potential to support a range of riparian and woodland species of conservation importance. There was no evidence of Himalayan balsam – a invasive non-native species listed under Schedule 9 of Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) that is typically associated with watercourses - growth during the walkover survey but the survey findings are constrained by the timing of the survey and this will be taken into account.

Bats

- 8.1.4** The riparian habitat (scattered trees and scrub) and woodland on site provide commuting and foraging habitat for bats, and potential to offer suitable roosting features. There were two alder (*Alnus glutinosa*) trees and an oak (*Quercus robur*) tree on site with visible roost features (i.e. thick ivy stems; **TN5 & TN6**). It is also possible that there were further trees within the woodland that possess potential bat roosting features.

Hazel Dormice

- 8.1.5** The site offers very limited opportunities for hazel dormice (*Muscardinus avellanarius*), in particular, habitat suited to their highly arboreal lifestyle and foraging requirements. The woodland on site lacks a dense understorey required for individuals to traverse without descending to the ground, and has low species diversity and therefore unlikely to provide adequate foraging required for successional feeding. Although suitable habitat is present in the form of an area of dense blackthorn in the woodland and denser patches of bramble understorey distributed along the Emm Brook paleo channel, the habitat on site is lacking in abundance of the main dormice food sources, i.e. hazel, oak, bramble and honeysuckle (English Nature 2006).
- 8.1.6** Furthermore, the site is isolated from the wider landscape by suburban surroundings and TVERC holds no records of dormice within a 2km radius of the site. Therefore it is considered that the sub-optimal habitat on site is unlikely to support dormice, which are known to live at low numbers even in optimal habitats.

Amphibians

- 8.1.7** The pond and Emm Brook paleo channel offer opportunities for amphibians – including great crested newt (GCN; *Triturus cristatus*), which receives full legal protection – to breed on site. Furthermore, the Thames Valley Environmental Records Centre (TVERC) holds records of GCN (eggs and live specimens) relating to land approximately 1.2km to the northwest of the site indicating the potential for GCNs to be present in the local area. The scattered trees, scrub and woodland provide terrestrial habitat suitable for any amphibians if present in the pond and paleo channel (further survey would be required to determine if great crested newts are present or likely to be absent – refer to recommendations in **Section 9.3**).
- 8.1.8** Other amphibians of conservation importance such as the common toad (*Bufo bufo*) have been historically recorded within the 2km radius search area, and as such, may use the pond and paleo channel as a breeding resource and the woodland as hibernation habitat. Common frog (*Rana temporaria*) spawn was observed in the Emm Brook paleo channel during

the survey, confirming the presence of amphibians on site. The current parkland management regime means that amphibians are unlikely to be present in the areas of open amenity grassland.

Reptiles

- 8.1.9** The scattered trees (including scrub along the Emm Brook paleo channel) and woodland habitats on site provide cover for reptiles but the parkland management regime means the grassland's short sward lacks the structural diversity suited to reptiles. The pond and Emm Brook paleo channel (with confirmed frog spawn) provides grass snakes on site with high quality foraging habitat and areas of dense, undisturbed riparian habitat to traverse.
- 8.1.10** There are records of common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*) within a 2km radius of the site. The closest records are of slow-worms, approximately 750 metres northwest, across the Reading Road, which poses a considerable barrier to movement south to the site. Despite an absence of reptile records on or close to the site, there is still potential for these widespread species to be present on site.

Badgers (and Other Mammals)

- 8.1.11** There were no signs of activity by badger (*Meles meles*) on site, such as latrines or sett entrances, and the badger records are either located on the other side of the A329 Motorway (a significant barrier to movement), or in the section of countryside between Barkham and Wokingham. Therefore, despite some suitable wooded habitat, it is considered highly unlikely that badgers are present in such an isolated site and in the absence of any visible signs of their presence.
- 8.1.12** The woodland on site is a habitat suitable for a range of small mammal species – including SPI, such as the hedgehog (*Erinaceus europaeus*), which has been recorded in Woosehill Meadows beyond the site boundary to the south and in the surrounding built-up areas.
- 8.1.13** The Emm Brook (and the paleo channel) provide habitat suitable for semi-aquatic species such as otter (*Lutra lutra*) and water vole (*Arvicola*

amphibius). However, no signs of otter (i.e. spraint or prints), or of water vole (i.e. latrines or burrows) were identified during the walkover. The modified channel offers no marginal or submerged vegetation to offer shelter to either species in an area with high levels of human disturbance. The suitability of the channel for these riparian mammals increases upstream with the presence of submerged and emergent vegetation but there is still heavy disturbance in the channel from dogs. Furthermore, the Emm Brook is currently of poor ecological status under the Water Framework Directive (WFD Status information (C2 2015 data)) and TVERC holds no records for these species within the 2km search radius; therefore it is considered unlikely that either of these species is present on site. Management of the watercourses and other habitat on site should take into account the potential future expansion of these two species from recent and historical records further north in the Borough.

Nesting Birds

- 8.1.14** The woodland, scattered trees and scrub provide nesting and foraging opportunities for common and widespread bird species, and may support some notable woodland species. The isolated site, in combination with the high level of disturbance, is considered highly unlikely to support bird communities of high conservation importance and therefore highly unlikely to be of ecological value to birds beyond the site level. The current channel does offer potential foraging habitat for kingfishers, but the shallow earth banks in both channels were not suitable for breeding kingfishers.

Invertebrates

- 8.1.15** The woodland has deadwood from fallen branches (including the large woody material) and brush piles which provide habitat suitable for stag beetle (*Lucanus cervus*) larvae – a locally recorded SPI. The parkland management regime means that the grassland is unlikely to support an important invertebrate assemblage.

8.2 Impact of Proposals

Overview

- 8.2.1** The Woosehill Fish Passage Improvements project led by the South East Rivers Trust (SERT) aims to provide fish passage past the weir by reconnecting the paleo channel (former route of the river) to the Emm Brook, which runs through parkland to the east of the current modified channel. The project proposals involve excavation works to reconnect the paleo channel to the Emm Brook and remove sediment in the paleo channel down to the former gravel bed. Some tree and scrub removal work will be required in order for a hydraulic excavator to gain access to the paleo channel. Furthermore, any large woody material in the paleo channel will be retained as features within the channel.

Habitats

- 8.2.2** The proposals to allow fish passage in the Emm Brook will require some tree and scrub removal in order for a hydraulic excavator to gain access to the paleo channel. The vegetation clearance in the woodland – an SPI – will be minimal not affecting the woodland character, however, the project is also aiming to combine appropriate management of the woodland to improve the structural and species diversity. All mature trees will be retained wherever possible and it is recommended that the scrubby understorey is opened up in areas, particularly to the north of the existing pond, to reduce the shading of the channel and encourage woodland flora to establish (refer to recommendation **Section 9.1**). This was already visible on the banks adjacent to the mature oak tree (TN6) and the open area around the pond, which had been enhanced by seeding/plug planting.
- 8.2.3** Himalayan balsam was not visible during the survey but as the survey was undertaken at a time of year when any previously cleared areas may not yet be visible, its presence must be considered prior to any excavation of the banks. **NB. SERT always follow strict biosecurity procedures with regards to invasive species and general pollution prevention guidelines.**

8.2.4 The project will result in the loss of a pond and this type of wetland habitat offers niches for a range of different species compared with the running water habitat, and therefore its loss without replacement would lead to loss of biodiversity interest. There is scope to create a replacement pond on site to ensure this habitat is not lost. If feasible, the existing modified channel could be managed as additional wetland habitat and has scope for the newly created pond (refer to recommendation in **Section 9.1**).

Bats

8.2.5 The proposals are unlikely to have an adverse impact on the availability of foraging habitat for bats as the woodland is to be retained in the long-term. However, several trees in the woodland and scattered along the paleo channel had features that were considered suitable for roosting bats, and thus, removal of trees in the woodland to allow for excavation of the channel, could result in the disturbance, injury or death of roosting bats, and therefore further survey is required (refer to recommendation in **Section 9.2**).

Hazel Dormice

8.2.6 Dormice are highly unlikely to be present on site and therefore it is considered that the proposals will not have an adverse impact on dormice.

Amphibians

8.2.7 The pond (excavated in the paleo channel) will be lost as part of the proposals and the work to the paleo channel will increase the flow of water in the channel. If breeding great crested newts are using the channel and/or pond on site, the proposed works may harm individual newts or even the local population if present. Further survey of the pond and paleo channel is required to determine the presence and/or likely absence of great crested newts (refer to recommendations in **Section 9.3**). The increased flow in the channel will also have an impact on common frogs (confirmed present during the walkover) and common toads if present reducing the likelihood of the species spawning and/or reducing breeding success rates (refer to recommendations in **Section 9.3**).

- 8.2.8** The removal of trees and large woody material, and channel excavation works, could impact on hibernating amphibians and therefore sensitive timing is recommended (refer to recommendations in **Section 9.3**)

Reptiles

- 8.2.9** The work to restore the paleo channel involves activities that have the potential to harm reptiles in the absence of mitigation. Reptiles hibernating in tree roots or amongst large woody material could be impacted by tree removal and the use of excavating machinery. If avoidance measures are adopted during the works, the proposals are not considered likely to cause any adverse impacts to reptiles (refer to recommendations in **Section 9.4**).

Nesting Birds

- 8.2.10** The woodland, scattered trees and scrub provide nesting opportunities for common and widespread bird species adapted to woodland habitats and therefore any removal could lead to bird nests being damaged, and to the disturbance of nesting birds, and as such necessary precautions must be adopted. Furthermore, noise and vibrations from the hydraulic excavator may disturb nesting birds in proximity to the paleo channel (refer to recommendations in **Section 9.5**).

Badgers (and Other Mammals)

- 8.2.11** The survey results show badgers are highly unlikely to be present on site and therefore it is considered that the proposals will not have an adverse impact on badgers.

Invertebrates

- 8.2.12** If stag beetle larvae are present in the deadwood along the paleo channel (i.e. large woody features), the removal of these features could lead to the loss of larvae and therefore precautions to prevent this should be adopted (refer to recommendations in **Section 9.6**).

9 RECOMMENDATIONS

9.1 Habitat Mitigation

9.1.1 To compensate for the loss of the pond on site following the channel diversion through the existing pond, a replacement pond should be created on site. There is scope to create a pond in the existing modified channel as part of the habitat enhancement in this area, and the feasibility of this, and further wetland habitat, is being investigated. Ideally this pond would be created and established overwinter before the amphibian breeding season in spring to provide continued habitat on site for amphibians throughout the works.

9.1.2 To compensate for the loss of scrub habitat during the opening up of the channel, used as a nesting and foraging resource by woodland birds, hazel and willow planting is encouraged on site. The planting could be positioned along the boundaries of housing to the east of the paleo channel, which would both link to the existing woodland on site and create screening for local residents.

9.2 Bats

9.2.1 A ground-level inspection of all trees to be removed or affected by the proposals should be undertaken by an ecologist in order to confirm absence/presence of bat roosting potential. If any trees are identified as having bat roost potential during the inspection and are proposed to be removed or affected by the works, then further survey should be undertaken to establish if roosting bats are present or likely to be absent.

9.2.2 Depending on the condition of the tree and type of features identified, a climbing inspection by a licensed tree climber may be suitable to determine presence or likely absence of roosting bats. An alternative survey approach would comprise emergence and/or re-entry surveys; such surveys should be carried out in the period between May and September. At least one visit would be required between May and August for trees of low potential; at least two surveys, with at least one visit between May and August, should be carried out for trees with moderate potential; and at least three surveys,

with at least two visits between May and August, should be carried out for trees with high potential (Collins 2016).

- 9.2.3** If roosting bats are shown to be present, tree felling or arboricultural works considered disturbing to the roost, or would result in the loss of the roost, should take place only after the grant of a European Protected Species licence issued by Natural England. Under the terms of the licence, the impact of the work on bats should be mitigated by excluding bats in advance where feasible, taking a precautionary soft-felling approach under the supervision of a licensed ecologist and providing alternative roosting sites e.g. tree-mounted bat boxes.

9.3 Amphibians

- 9.3.1** The presence or likely absence of great crested newts in the pond and paleo channel on site should be determined using appropriate survey techniques e.g. eDNA analysis of water samples taken between April and late June, and followed by traditional presence/absence surveys using trapping torchlight, egg searching and/or netting between mid-March and mid-June if eDNA analysis reveals a positive result (English Nature 2001). If great crested newts are found to be present, the loss of the pond habitat and changes to the paleo channel are likely to require a European Protected Species mitigation licence to proceed lawfully.

- 9.3.2** Furthermore, if surveys confirm the presence of great crested newts, the woodland and riparian habitat has potential to provide sheltering and overwintering habitat for newts and other amphibians. In the absence of appropriate mitigation, tree and scrub removal, and use of heavy machinery in the woodland, both have the potential to kill and/or injure amphibians, including great crested newts in the terrestrial phase of their yearly cycle and thereby contravene the strict European and national legislation protecting this species and its habitats. In order to avoid this, it is recommended that the following approach be adopted:

- Ground/tree root clearance works should be timed to avoid the hibernation period and should be undertaken when animals are least likely to be present (i.e. works should be undertaken in March-July and once nesting bird absence has been confirmed) when the majority of amphibians will be within aquatic habitats (the breeding season).

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- Prior to works, any logs, debris and leaf litter in the area required clearance should be carefully search by hand by an appropriately licensed ecologist.
- A destructive search of ground to be removed (i.e. sediment in the paleo channel) will then be undertaken using a hydraulic extractor with a toothed bucket in the presence of an appropriately licensed ecologist.

9.4 Reptiles

9.4.1 The site has the potential to provide foraging and sheltering habitat for low numbers of reptiles, and hibernation habitat in the woodland. Given that reptiles are known to be present in the wider area, there is the potential that small numbers of reptiles could be killed and/or injured during activities that involve clearance and excavation in the absence of the following precautionary measures:

- Tree and scrub removal, and excavation work with heavy machinery, should be undertaken between March and October (once nesting bird absence has been confirmed) when reptiles are active avoiding the hibernation period when they may be hibernating in the root boles.
- Any reptiles found will be moved to suitable habitat close to, but outside the site or working area boundary (e.g. undisturbed areas of woodland nearby).

9.4.2 Adhering to the guidance outlined above will ensure that reptiles are protected from reckless killing and injury during any subsequent works.

9.5 Nesting Birds

9.5.1 Any tree or dense bramble removal required should be completed outside of the peak bird nesting season (March to August inclusive) or if that is unavoidable, only following an inspection by an ecologist confirming that there is no current nesting activity. In the event that nesting birds are discovered prior to or during the course of any work, work affecting the nesting site should stop immediately and should continue only once the bird nesting has finished i.e. young have fledged and left the nest.

9.6 Invertebrates

- 9.6.1 Any clearance of deadwood or removal of large woody material should be completed with an ecologist present so that if stag beetle larvae are uncovered, the ecologist can carefully translocate the larvae to a suitable natural or purpose-built habitat close by (in line with amphibian and reptile precautions in Section 9.3 and 9.4).

9.7 Ecological Enhancement

- 9.7.1 The aim to improve fish passage in the Emm Brook by restoring the paleo channel provides a range of opportunities for the enhancement of the site's biodiversity value. Appropriate ecological enhancements for the site were discussed with the Council's Ecology Officer and these can be carried out in a phased approach with some elements included in a long-term management plan for the site. Taking into account the findings of the walkover survey and current ecological value and habitat condition of the site, the inclusion of the following recommendations would be of ecological benefit to the site:

- The amenity grassland could be enhanced by introducing a cutting regime whereby the grass is cut after flowers have set seed, for example until after mid-July. Plug planting of spring flowering plant species in areas with minimal human disturbance will be both ecologically beneficial and of amenity value to the general public using the site; the inclusion of yellow rattle (*Rhinanthus minor*) can help the wildflower species to establish by reducing the grass growth. The location of grassland enhancements would be most effective on the woodland and channel boundaries and avoiding the potential new Greenways route proposed for the site. There is scope to widen the grassland planting and management regime into Woosehill Meadows to the south as the grassland area widens and there are fewer constraints on the land-use;
- The flood relief channel (current modified channel) could act as a wetland area. The channel could be re-profiled and planted with emergent herbaceous vegetation dominated by grasses, sedges and reeds sourced from suppliers providing appropriately sourced UK stock of local provenance. The channel is heavily shaded and selective thinning will be necessary to ensure successful uptake; the use of coir

mats with prepared seed beds suitable for seasonally inundated habitat will assist with a quick uptake and establishment of plants in this area. A phased approach to the existing channel enhancement following the channel diversion would be the most effective approach in determining appropriate habitat creation in this area, and if suitably wet, reedbed creation would assist with water treatment of the outfalls that would remain in the modified channel - the feasibility of the wetland habitat is being investigated;

- The provision of bat and bird boxes on mature trees in the woodland to enhance the site for roosting bats and nesting birds. To preserve the 'naturalness' of the woodland and provide discrete roosting and nesting features in a public open space, the use of bark boxes for both bats and birds should be considered (www.barkboxes.co.uk); and
- Stag beetle habitat could be introduced into the woodland by reusing large woody material from the excavated channel and digging the logs into the ground in a vertical position.

10 REFERENCES

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APPENDIX 1 - SITE PHOTOGRAPHS



1. Main (modified) channel of the Emm Brook (RWM1).



2. Weir and pool in the main channel (TN1).



3. Paleo channel of the Emm Brook (RWM2).



4. Raised foul pipe across paleo channel (TN3).



5. Pond within course of paleo channel (SWM1).



6. Thick ivy on alder trees either side of path next to pond (TN6).



7. Open area of amenity grassland (AM1).



8. Semi-natural broadleaved woodland in south of site (BW1).



9. Semi-natural broadleaved woodland in north of site (BW2).



10. Scattered broadleaved trees along banks of paleo channel (SBW1).



11. Large mature oak tree (TN6).



12. Scattered broadleaved trees along banks of main channel (SBW2).

APPENDIX 2 - PHASE 1 HABITAT SURVEY PLAN



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Key:

- Target notes
- Running water - mesotrophic
- Standing water - mesotrophic
- Amenity grassland
- Broadleaved woodland - semi-natural
- Broadleaved scattered trees

Emm Brook, Woosehill
Phase 1 Habitat Map

April 2019

JOHN WENMAN
ecological consultancy

John Wenman Ecological Consultancy

PHASE 1 HABITAT SURVEY NOTES

Habitat code	Habitat Description
RWM1	Running water – mesotrophic – The Emm Brook spanned the western side of the site and exhibited a straight, modified channel lacking in established marginal or submerged vegetation (Photograph 1). Species recorded: lesser celandine (<i>Ficaria verna</i>), ivy (<i>Hedera helix</i>), cleavers (<i>Galium aparine</i>) and dock (<i>Rumex</i> sp.).
RWM2	Running water – mesotrophic – The paleo channel of the Emm Brook meandered through the woodland and parkland to the east of the main channel (Photograph 3). Species recorded: marsh marigold (<i>Caltha palustris</i>), floating sweet-grass (<i>Glyceria fluitans</i>), grey sedge (<i>Carex divulsa</i>), hemlock water-dropwort (<i>Oenanthe crocata</i>), reed canary-grass (<i>Phalaris arundinacea</i>), borage (<i>Borago officinalis</i>), water mint (<i>Mentha aquatica</i>), remote sedge (<i>Carex remota</i>) and willowherb (<i>Epilobium</i> sp.).
SWM1	Standing water - mesotrophic – A section of the paleo channel had been excavated to create a pond in the centre of the site (Photograph 5). Species recorded: marsh marigold (<i>Caltha palustris</i>), water mint (<i>Mentha aquatica</i>), hard rush (<i>Juncus inflexus</i>), common reed (<i>Phragmites australis</i>), hemlock water-dropwort (<i>Oenanthe crocata</i>), <i>Iris</i> sp. and floating sweet-grass (<i>Glyceria fluitans</i>).
AM1	Amenity grassland – Large areas of the site consisted of amenity grassland (Photograph 7) Species recorded: abundant perennial ryegrass (<i>Lolium perenne</i>); frequent cock's-foot (<i>Dactylis glomerata</i>) and Yorkshire fog (<i>Holcus lanatus</i>); occasional dandelion (<i>Taraxacum</i> agg.), cow parsley (<i>Anthriscus sylvestris</i>), common hogweed (<i>Heracleum sphondylium</i>), greater plantain (<i>Plantago major</i>), creeping buttercup (<i>Ranunculus repens</i>), dock (<i>Rumex</i> sp.), common ragwort (<i>Senecio jacobaea</i>) and white clover (<i>Trifolium repens</i>).
BW1	Semi-natural broadleaved woodland – There was a parcel of semi-natural broadleaved woodland in the south of the site (Photograph 8). Tree and shrub species recorded: abundant willow (<i>Salix</i> sp.); occasional alder (<i>Alnus glutinosa</i>), hawthorn (<i>Crataegus monogyna</i>) and elder (<i>Sambucus nigra</i>), poplar (<i>Populus</i> sp.); and locally-abundant blackthorn (<i>Prunus spinosa</i>). Ground flora species recorded: bramble (<i>Rubus fruticosus</i> agg.), meadowsweet (<i>Filipendula ulmaria</i>), lords-and-ladies (<i>Arum maculatum</i>), cleavers (<i>Galium aparine</i>), wood avens (<i>Geum urbanum</i>) and common nettle (<i>Urtica dioica</i>).
BW2	Semi-natural broadleaved woodland – A parcel of semi-natural broadleaved woodland was present in the north of the site (Photograph 9) Tree species recorded: frequent alder (<i>Alnus glutinosa</i>); occasional holly (<i>Ilex aquifolium</i>), pedunculate oak (<i>Quercus robur</i>), willow (<i>Salix</i> sp.), yew (<i>Taxus baccata</i>) and elm (<i>Ulmus</i> sp.); and locally-frequent poplar (<i>Populus</i> sp.). Other species recorded: frequent elder (<i>Sambucus nigra</i>); occasional lesser celandine (<i>Ranunculus ficaria</i>), cleavers (<i>Galium aparine</i>), wood avens (<i>Geum urbanum</i>), ivy (<i>Hedera helix</i>), ground elder (<i>Aegopodium podagraria</i>), common nettle (<i>Urtica dioica</i>), bramble (<i>Rubus fruticosus</i> agg.), lords-and-ladies (<i>Arum maculatum</i>) and ground ivy (<i>Glechoma hederacea</i>).
SBW1	Scattered broadleaved trees – The paleo channel of the Emm Brook had scattered broadleaved trees and bramble (<i>Rubus fruticosus</i> agg.) scrub lining its banks in the centre of the site (Photograph 10). Species recorded: frequent alder (<i>Alnus glutinosa</i>); occasional elder (<i>Sambucus nigra</i>); rare hazel (<i>Corylus avellana</i>) and pedunculate oak (<i>Quercus robur</i>).
SBW2	Scattered broadleaved trees – The main channel of the Emm Brook had scattered broadleaved trees lining its banks from the southern survey boundary up to the woodland in the north of the site (Photograph 12). Species recorded: frequent cleavers (<i>Galium aparine</i>) and bramble (<i>Rubus fruticosus</i> agg.); occasional hawthorn (<i>Crataegus monogyna</i>), ash (<i>Fraxinus excelsior</i>), pedunculate oak (<i>Quercus robur</i>), willow (<i>Salix</i> sp.), elder (<i>Sambucus nigra</i>), meadowsweet (<i>Filipendula ulmaria</i>), common nettle (<i>Urtica dioica</i>), hemlock water-dropwort (<i>Oenanthe crocata</i>); locally-frequent hornbeam (<i>Carpinus betulus</i>).
TN1	A weir and pool in the main Emm Brook channel (Photograph 2).
TN2	A foul pipe in the main Emm Brook channel.
TN3	A raised foul pipe and two large fallen tree trunks in the Emm Brook paleo channel (large woody material) (Photograph 4).
TN4	Grassland along the western side of the pond with a greater variety of species (likely from seeding) than the surrounding amenity land (TN4).
TN5	Two alder trees (<i>Alnus glutinosa</i>) next to the pond (crossing the paleo channel) possessing potential bat roost features (Photograph 6).
TN6	A large, mature oak tree with thick ivy (and potential other features) offering potential opportunities to roosting bats (Photograph 11).

APPENDIX 3 - PLANT SPECIES RECORDED DURING THE SURVEY

Plant common name	Scientific name
Alder	<i>Alnus glutinosa</i>
Ash	<i>Fraxinus excelsior</i>
Blackthorn	<i>Prunus spinosa</i>
Borage	<i>Borago officinalis</i>
Bramble	<i>Rubus fruticosus</i> agg.
Cleavers	<i>Galium aparine</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common hogweed	<i>Heracleum sphondylium</i>
Common nettle	<i>Urtica dioica</i>
Common ragwort	<i>Senecio jacobaea</i>
Common reed	<i>Phragmites australis</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Creeping buttercup	<i>Ranunculus repens</i>
Dandelion	<i>Taraxacum</i> agg.
Dock	<i>Rumex</i> sp.
Elder	<i>Sambucus nigra</i>
Elm	<i>Ulmus</i> sp.
Floating sweet-grass	<i>Glyceria fluitans</i>
Greater plantain	<i>Plantago major</i>
Grey sedge	<i>Carex divulsa</i>
Ground elder	<i>Aegopodium podagraria</i>
Ground ivy	<i>Glechoma hederacea</i>
Hard rush	<i>Juncus inflexus</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Hemlock water-dropwort	<i>Oenanthe crocata</i>
Holly	<i>Ilex aquifolium</i>
Hornbeam	<i>Carpinus betulus</i>
Iris	<i>Iris</i> sp.
Ivy	<i>Hedera helix</i>
Lesser celandine	<i>Ranunculus ficaria</i>
Lords-and-ladies	<i>Arum maculatum</i>
Marsh marigold	<i>Caltha palustris</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Pedunculate oak	<i>Quercus robur</i>
Perennial ryegrass	<i>Lolium perenne</i>
Poplar	<i>Populus</i> sp.
Reed canary-grass	<i>Phalaris arundinacea</i>
Remote sedge	<i>Carex remota</i>
Water mint	<i>Mentha aquatica</i>
White clover	<i>Trifolium repens</i>
Willow	<i>Salix</i> sp.
Willowherb	<i>Epilobium</i> sp.
Wood avens	<i>Geum urbanum</i>
Yew	<i>Taxus baccata</i>
Yorkshire fog	<i>Holcus lanatus</i>

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