

University of Reading Whiteknights Campus Rugby Pitches Ecological Appraisal

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University of Reading Whiteknights Campus Rugby Pitches Ecological Appraisal

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University of Reading Whiteknights Campus Rugby Pitches

Ecological Appraisal

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Ecological Appraisal

Executive Summary

Ecological Planning & Research Ltd (EPR) was commissioned to carry out an Ecological Appraisal of an existing cricket pitch at Whiteknights Campus, University of Reading, to inform an application for a new 3G (Third Generation) Artificial turf pitch to be installed to replace it. The proposals have the potential to allow the pitches to be used in all weather.

The Whiteknights sports area is situated within the south eastern corner of Reading. The Site is at the edge of parkland habitat with older planted trees, small woods, buildings and amenity grassland.

The proposals will result in the removal of turf, topsoil and subsoil and replacement with layers of tarmac and artificial and plastic substrate and an increase in illumination. Once built, the 'Guidelines for Cleaner Pitches' will be followed to minimise the amount of microplastic loss from the pitches.

Three small woodlands are present, which show Low-moderate or Moderate suitability for bats. The woodlands are of undetermined origin, but they are present on the 6" 1883 Ordnance Survey map of the area.

Floodlighting has been mitigated for through design of the lights and through cowls that are to be installed. The impacts of lighting on birds, particularly Stock Dove is mitigated through the provision of bird boxes. Suggestions for ecological enhancement at the Site include bird boxes for Swift, bat boxes and leaving some areas unmown to increase floral diversity, and invertebrates. Hedgehog hibernation boxes and Stag beetle larvae loggeries are also recommended.

University of Reading Whiteknights Campus Rugby Pitches

Ecological Appraisal

1. INTRODUCTION

Brief

- 1.1 Ecological Planning & Research Limited (EPR) was commissioned by University of Reading through instruction from Bailey Partnership to carry out an Ecological Appraisal of a sports area at Whiteknights Campus in Reading, centred on Grid reference SU 730721. An ecological appraisal is required for a planning application to resurface the grass area with a 3G ('Third Generation') artificial surface so that it can be used in all weathers.

Background

- 1.2 A draft plan of the works is included in **Appendix 1**.
- 1.3 Synthetic grass football pitch is constructed from a free draining sub base, an asphalt base layer, a shockpad layer and an artificial 3G grass carpet. Drainage is constructed beneath, to remove surface water. This will connect to drains which discharge to storm water sewers, soakaways or watercourses.
- 1.4 Tarmac ensures that the sub-base remains in place. On top of that a shockpad is used for stability and cushioning. A shockpad means that a carpet with shorter pile and less infill can be used. They are made of rubber mixes or rubber or polyethylene panels or rolls.
- 1.5 3G synthetic turf carpets typically have a polyethylene monofilament yarn, sometimes with a backing, and a pile height of 40 – 60 mm. The weight is usually between 900 mg / m² and 1600 / m². The total synthetic area is calculated as 9,955 m².
- 1.6 Guidance to minimise the spread of the 'rubber crumb' microplastics from the turf is provided in 'Guidelines for Cleaner Pitches' which should be followed to prevent these escaping into the water system. The ecological impacts of these is less quantifiable but it has been highlighted as a potentially significant problem for aquatic ecosystems. The small particles can be ingested by various marine animals and can progress up the food chain causing chemical and physical effects (Eunomia, 2017).
- 1.7 Eight floodlights are to be installed around the pitch as shown on the plan in **Appendix 1**. The lights will be LED with colour temperature of 4000K. The predicted light spill from the sports pitch is indicated on **Appendix 1**. Floodlighting has been selected designed specifically for floodlighting sports fields and will be angled to reduce light spill. Cowls will also be used to reduce overspill.
- 1.8 The new sports pitch will be surrounded by a 3m high fence, kerbing and a grass mowing strip.

The Study Area

- 1.9 The area within the red line on **Map 1** indicates the study area, referred to as the Site within this document. As can be seen, the Site is situated just to the south east of the centre of Reading at the north west corner of the Whiteknights Campus of Reading University.

National Character Area 115: Thames Valley

- 1.10 Whiteknights Campus is located within the Thames Valley Character Area (NCA). NCAs are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries. The information contained within NCAs supports planning of conservation initiatives at a landscape scale and includes a description of the natural and cultural features that shape the landscape and a broad analysis of each area's characteristics and ecosystem services.
- 1.11 The Thames Valley NCA is mainly low-lying, with the River Thames as the central feature through a diverse landscape of fragmented agricultural land, historic parks and commons, woodlands, reservoirs, mineral workings and urban and suburban settlements. The Thames Valley is dominated by the Thames and its tributaries, part of the Grand Union Canal and the reservoirs which form the South-West London Waterbodies Special Protection Area (SPA) and Ramsar Site. These provide essential water supply services for London and the surrounding area, as well as being important for wildlife.
- 1.12 Although the landscape of the NCA is densely populated and developed, there are pockets of woodland, open grassland, parkland and wetland with a variety of habitats supporting important populations of many species such as wildfowl and invertebrates such as Stag Beetle *Lucanus cervus*.
- 1.13 Within each Natural Area profile, there are associated Statements of Environmental Opportunity (SEO). Specific environmental opportunities relevant to the Site could include (see Statement of Environmental Opportunity SEO 4: 'Protect and manage the area's historic parklands, wood pastures, ancient woodland, commons, orchards and distinctive ancient pollards, and restore and increase woodland for carbon sequestration, noise and pollution reduction, wood fuel and protection from soil erosion, while also enhancing biodiversity, sense of place and history':
- Restoring and sustainably managing the area's historic parkland and wood pasture.
 - Conserving characteristic ancient trees in hedgerows, fields, historic parklands and areas of wood pasture.
 - Restoring, expanding and sustainably managing woodlands, including ancient woodland, for the prevention of soil erosion, carbon sequestration and storage, recreation, enhancing biodiversity and landscape and providing a local source of wood fuel.

Geology

- 1.14 With reference to the British Geological Survey website www.bgs.ac.uk, and the 1:50,000 scale geology maps, the bedrock geology of the Site is of London Clay formation with clay, silt and sand. The Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene period. These sedimentary rocks are marine in origin and are detrital, comprising

coarse to fine grained slurries of debris from the continental shelf flowing into a deep sea environment, forming graded beds.

- 1.15 The superficial deposits over the majority of the Site are described as Boyn Hill Gravel Member – Sand and Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. The local environment was previously dominated by rivers. These deposits are fluvial in origin and are detrital, ranging from coarse to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river.
- 1.16 There is a small tongue of land at the south of the Site where the superficial deposits are described as Head – Clay, Silt, Sand and Gravel, forming up to 3 million years ago. The local environment was previously dominated by subaerial slopes.
- 1.17 A small area in the south east of the Site shows ‘none recorded’ for superficial deposits.

Soils

- 1.18 With reference to the Soil Survey of England and Wales (<http://landis.org.uk/soilscapes>), the soils within the southern two thirds of the Site are loamy with naturally high groundwater. The northern third of the Site contains freely draining and slightly acid loamy soils.

Hydrology

- 1.19 With reference to the Environment Agency’s flood maps for planning website, the area closest to the river bank is in ‘Flood Zone 1’ which means this land has less than 1 in 1,000 annual probability of flooding.
- 1.20 The Environment Agency usually requires a flood risk assessment to be carried out for any development within Flood Zone 1 that is greater than 1 ha and that is in an area with critical drainage problems as notified by the Environment Agency. It is assumed that a flood risk assessment is therefore not needed in this case.

Landscape History

- 1.21 Whiteknights Campus was originally part of the Whiteknights Estate, in existence since at least the 12th Century. The main habitat type within the estate appears to have been parkland with trees, with reference to maps dating back to 1877 (see the National Library of Scotland website, which hosts digitised copies of old maps <http://maps.nls.uk>). The earliest published map of the area, an Ordnance Survey 6” map dated 1883 shows Site appears to have been mainly parkland with trees (coniferous and broad-leaved), dissected by several field boundaries that appear to have been fences. There are a couple of small copses on the Site which appear on this 1883 map.
- 1.22 The University of Reading acquired the Whiteknights Estate in 1947 and most of the buildings were built between 1950 and 2000.

Brief Description of Site and Surroundings

- 1.23 The wider Whiteknights Campus comprises mainly Wood pasture and Parkland Biodiversity Action Plan (BAP) Priority Habitat, and Deciduous Woodland (listed on the Priority Habitat Inventory). The Site itself in the north eastern part of the Campus has no designations.

- 1.24 Most of the Site comprises mown amenity grassland used for sports, with small copses and clumps of trees. There is a parking area on the western edge, on the eastern side of Elmhurst Road. The boundaries consist of Elmhurst Road on the western edge, and the edge of a sports pitch at the north. The University Tennis Courts form part of the boundary on the eastern side, and the Site includes some of the field north of this. The Site boundary extends just south of the woodland adjacent to Dunsden Crescent to incorporate a small copse.

Scope

- 1.25 The purpose of this Ecological Appraisal is to obtain and present information on potential ecological constraints and opportunities that may be presented to the Proposals. Advice on further actions to address constraints and maximise opportunities to enable the proposals to proceed in accordance with nature conservation legislation and policy is also provided. Please note that the results of an Ecological Appraisal are not equivalent to a full Ecological Impact Assessment (EclA) and so potentially significant ecological effects arising from a Proposal may not be fully understood at the time of reporting on an Ecological Appraisal.
- 1.26 EPR's approach takes account of the Chartered Institute of Ecology and Environmental Management's (CIEEM) advice in Guidelines for Ecological Impact Assessment in the UK and Ireland (August 2018).
- 1.27 An ecological appraisal comprises two main elements: 1) A desktop review of the ecological and policy context; and 2) a field survey of the development site and, where possible, any other areas likely to be affected.
- 1.28 The following articles of nature conservation legislation and planning policy are of relevance to the Proposals, and have been considered as part of this appraisal:
- The Conservation of Habitats and Species Regulations 2017;
 - The Wildlife and Countryside Act 1981 (as amended);
 - The Countryside and Rights of Way (CROW) Act 2000;
 - The Natural Environment and Rural Communities (NERC) Act 2006;
 - The Protection of Badgers Act 1992; and
 - The National Planning Policy Framework (NPPF), (2018).
- 1.29 Reading Borough Council is currently working on a new Local Plan which contains the planning policies to guide development up to 2016. Consultation on a Draft Local Plan took place between 1 May 2017 and 14 June 2017, and consultation on a Pre-Submission Draft Local Plan took place between 30 November 2017 to 26 January 2018. The Local Plan was submitted to the Secretary of State on 29 March 2018.
- 1.30 In the meantime, policies from the Local Development Framework Core Strategy (adopted January 2008) with some alterations (adopted January 2015) are in use. Those that are relevant to the proposals for the Sports pitches include:
- Policy CS36: Biodiversity and Geology; and
 - Policy CS38: Trees, Hedges and Woodlands.

1.31 In addition to the above, biodiversity objectives detailed in the following documents have been considered:

- Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services;
- The 25 Year Environment Plan;
- The University of Reading's Biodiversity Strategy.

1.32 Further information on the above is provided in **Appendix 2**.

Methods and Constraints

1.33 This Ecological Appraisal has drawn on information collected through both a desktop study, and a field visit carried out by Helen Demopoulos of EPR on 27 March 2019. The methodology used has been described in more detail in **Appendix 3**.

1.34 A potential constraint to the results is the time of year of survey; as the survey was undertaken early in the season before spring vegetation growth, some species may have been missed. This is unlikely however to alter the overall assessment.

2. NATURE AND EXTENT OF PREDICTED BIOPHYSICAL CHANGES

Predicted Biophysical Changes

- 2.1 Certain activities associated with the preparation, construction and operation of the Proposal are likely to generate biophysical changes. These changes, and the Zone of Influence (ZoI) over which they are likely to occur, are summarised in **Table 2.1** below.

Table 2.1: Summary of predicted changes and Zone of Influence

Predicted Change	Zone of Influence
<u>Preliminary Activities</u>	
Vegetation clearance for site compounds?	Site
<u>Construction Phase</u>	
Turf stripping from pitch area	Site
Soil removal from pitch area	Site
Soil removal of footings for lights	Site
Lighting	Site
Set up and subsequent removal of site compound; storage areas for turf	Site
<u>Operational Phase</u>	
Light spill from floodlights on to and outside of the pitch area	Site and surrounding area
Maintenance operations	Site
Dispersal of rubber crumb from the pitch area	Site
<u>Decommissioning Phase</u>	
Recycling of material and re-use and disposal	Site and surrounding area

- 2.2 The Zones of Influence for each of these predicted changes are mainly considered to be within the Site or in the immediately surrounding area.

3. RESULTS OF ECOLOGICAL APPRAISAL

Introduction

3.1 The findings of the Ecological Appraisal are set out below, including:

- The potential for important ecological features to be present within the ZOI that could be affected by the Proposals;
- Potentially significant impacts (both positive and negative) that could occur as a result of the predicted biophysical changes described in **Section 2**, in the absence of impact avoidance and mitigation measures;
- A broad overview, where possible, of the measures that are likely to be required to avoid, mitigate and as a last resort compensate for significant negative effects on important ecological features;
- Opportunities to deliver net gains in biodiversity in accordance with the aspirations of National and local planning and biodiversity policy, including Section 15 of the NPPF; and
- Recommendations for further survey necessary to inform assessment and design of the above, compliance with policy, legislation and/or ongoing management of the site.

Ecological Context

- 3.2 Whiteknights Campus is located in the south east corner of Reading, approximately 2 km south of the River Thames. The area where the sports pitches are, incorporating the Site, is at the north western end of Whiteknights campus. The landscape immediately to the north and west of the Site is suburban, and to the east and south is parkland with mainly planted scattered trees and buildings.
- 3.3 Data from the Thames Valley Environmental Records Centre (TVERC) was obtained and the relevant species data is discussed below and mapped on **Maps 3a – g**.

Designated Sites

- 3.4 **Map 1** shows the nature conservation designations up to 5 km from the site of the Proposals.

Statutory Designated Sites

- 3.5 The closest statutory designated sites are High Wood and Maiden Erlegh Woods Local Nature Reserves (LNRs), both just under 2 km to the east. Parts of High Wood have been included on the Ancient Woodland inventory. Maiden Erlegh Woods consists of ancient and semi-natural woodland with a stream flowing through part of it. Neither of these are likely to be affected by the proposals.
- 3.6 Other LNRs exist within 5 km of the site; these are predominantly designated on account of their woodlands apart from Ali's Pond LNR which is an urban fringe LNR with a high level of biodiversity.
- 3.7 Lodge Wood and Sandford Mill SSSI (Site of Special Scientific Interest) is 5 km to the east of the Site and designated for its populations of Loddon Lily and Summer Snowflake plants. This

SSSI is very unlikely to be affected by the proposals. There are no other statutory designated sites within 5 km of the proposals.

Non-Statutory Designated Sites

- 3.8 The closest non-statutory designated site is Whitley Park Farm/St Patricks Hall Pond LWS, approximately 400m to the south west of the Site across a main road, the A327. The LWS comprises mixed broad-leaved semi-natural woodland and two ponds, and is important for its bird fauna, particularly species listed on the Birds of Conservation Concern (BoCC), red and amber lists. It is unlikely that these Whitley Park Farm/St Patricks Hall Pond LWS will be affected by the proposals.
- 3.9 Whiteknights Park Local Wildlife Site (LWS) which is just under 450 m away from the red line. The LWS encompasses Whiteknights lake, which is large and eutrophic, and a mosaic of landscaped trees within mown grassland and some mixed secondary woodland. It is also noted for its ornithological interest.
- 3.10 The habitat of the designated part of Whiteknights Park is contiguous with the Site, being parkland with scattered trees. With the design mitigation in place, the proposals are unlikely to adversely affect Whiteknights Park LWS.

Habitats

- 3.11 Relevant protected and notable species from the TVERC data search are presented on **Maps 3a-3g**. It is worth noting that there is a large number of records for Whiteknights Campus, due to its situation as part of Reading University, and the number of habitat types, particularly the trees and large lake, that can support a high biodiversity. The distribution of broad habitat types and features noted during the field visit are presented on **Map 4** and are described further below.

Amenity Grassland

- 3.12 At the time of survey visit, as mentioned in **Section 1.27**, the grounds were very close mown and at the start of the season not all species are readily identifiable, so a comprehensive species list was not completed. The sports fields are all very similar, so although a brief description of each is given, the effects of the proposals are discussed together. As well as a frequent mowing regime (once or twice a week during the summer months) the turf of Sports Field 3 has vertical cuts put in every week which help to minimise soil compaction and help with drainage. There are portable large lights currently placed within Sports Field 3 and the locations at the time of survey are indicated on **Map 3**.

Sports Field 1

- 3.13 This field is located at the northern part of the site and is slightly lower lying than the adjacent sports pitch to the south (Sports Field 2). It comprises mainly of Rye-grass *Lolium perenne* with small amounts of Daisy *Bellis perennis* and Yarrow *Achillea millefolium*. This grass of this field is slightly longer than the rest of the sports pitches, presumably due to slightly less frequent use.

Sports Field 2

- 3.14 Sports field 2 comprises mainly of Rye-grass with a few other common species including Annual Meadow-grass *Poa annua*, Yarrow, Self-heal *Prunella vulgaris*, Dove's-foot Cranesbill *Geranium mole* and Creeping Thistle *Cirsium arvense*.

Sports Field 3

- 3.15 Sports field 3 comprises Rye-grass with bare ground and a very small amount of Greater Plantain *Plantago major*.

Evaluation

- 3.16 Due to their use and management the Sports Fields have a very limited floral diversity and are shown as Amenity Grassland on **Map 4**. They do not support any of the species marked on **Map 3a**. They are therefore not an Important Ecological Feature and are not considered further within this ecological appraisal.

Woodlands and Planted Trees

- 3.17 There are three small woodlands, a group of planted trees and one solitary planted tree within the Site boundary, marked on **Map 3**, and they are described below.

Tree A

- 3.18 This non-native parkland tree is a Wellingtonia *Sequoiadendron giganteum*, and although it is not native it is likely to support nesting birds and invertebrates.

Woodland B

- 3.19 Located on the eastern side of the Site, this small woodland is approximately 1,151m². It contains a number of standards including Common Lime *Tilia x Europaea*, Oak *Quercus robur* and Horse chestnut *Aesculus hippocastanum*, with Yew *Taxus baccata* and Holly *Ilex aquifolium* seedlings and saplings, and Bramble *Rubus fruticosus*. There are also a number of planted Common Lime *Tilia europaea pallida* saplings. The 1883 map shows this woodland, although it appears to have reduced in size since then.
- 3.20 The ground flora contains Bluebells *Hyacinthoides non-scripta*, an indicator of ancient woodland. Other species within Woodland B and its immediate vicinity include Self-heal, Green Alkanet *Pentaglottis sempervirens*, Groundsel *Senecio vulgaris*, Cleavers *Galium aparine*, Rye-grass, Annual meadow-grass, Hairy Tare *Vicia hirsuta*, Arum Lily *Arum maculatum* and clumps of Common Chickweed *Stellaria media* and Springbeauty *Claytonia perfoliata*, a non-native plant. All of these are common species of woodland or waste ground.
- 3.21 Dead wood on the woodland floor provides habitat for saproxylic invertebrates.

Woodland C

- 3.22 Woodland C is located at the northern edge of the site near the boundary with Dunsden Crescent and Mackinder Hall, and it is slightly smaller in area than Woodland B, of approximately 1,092 m². It is shown on the 1883 map of the area. Woodland C contains similar species to Woodland B, including Common Lime, Oak and Horse Chestnut, with Holly, Yew and Bramble. The herb layer includes Cow-parsley *Anthriscus sylvestris*, Green Alkanet, Common Nettle *Urtica dioica*, Self-heal, Common Chickweed and Springbeauty.

Woodland D

- 3.23 Woodland D provides a boundary between the sports grounds and the Hall of Residence at the northern boundary of the Site and is very close to Woodland C. This may contain part of the woodland shown on the 1883 map of the area. Species present include Hazel, Horse Chestnut, Holly, Ivy and Green Alkanet and Nettle in the herb layer.

Planted Trees E

- 3.24 This group of 5 planted trees including Oak and Common Lime exists at the southern end of the car park. These trees contribute to the parkland appearance of the campus. They are likely to support some invertebrate life and provide nesting places for birds as well as potential roosting and feeding areas for bats.

Woodland F

- 3.25 The position of this woodland corresponds to a group of trees indicated on the 1883 map. Tree species include Oak, Common Lime, Elder, Yew and Holly, with a very large standard Oak at the north western corner. The herb layer includes common species such as Bramble, Ivy, Common Nettle, Cleavers, Cow Parsley and Bluebells – some of which are introduced. A very small woodland pond exists measures 15 x 2 m with a maximum depth of 10 cm. This is likely to be ephemeral and is possibly a storm drain from the adjacent car park. There is dead wood present on the ground providing potential habitat for saproxylic invertebrates.

Boundary Hedgerow and Trees

- 3.26 The Site boundary incorporates the boundary hedgerow along Elmhurst Lane, comprising mainly of Beech *Fagus sylvatica* and some planted London Plane *Platanus x hispanica* trees.

Evaluation of Woodlands & Trees

- 3.27 From the information on the 1883 map and the species present, it cannot be concluded whether or not the woodlands are of ancient origin. They are however of ecological value at the Local level.

Effects of Proposals on Woodlands

- 3.28 The proposals have been designed in such a way as to minimise their effects on trees by leaving a 15 m exclusion zone between the fencing for the new sports pitch and the tree canopy to avoid compacting the tree roots.
- 3.29 The floodlighting has been designed to angle downwards on to the pitch to minimise overspill and sky lighting. There will however be some overspill into the existing woodlands as indicated in **Appendix 1**.
- 3.30 Enhancements to the woodlands and planted trees could include the cessation of tipping grass cuttings (this enriches the woodland soils and decreases the floral diversity). This would be in line with the University of Reading's Biodiversity Policy 2017.

Invasive Species

- 3.31 Invasive species noted present on Whiteknights Campus and that were close to the site itself include Japanese Knotweed *Fallopia japonica* and Rhododendron *Rhododendron ponticum*. None were noted on Site whilst carrying out the survey and it is very unlikely that the proposals would further their spread.

Fauna

Bats

- 3.32 Bat species that have been recorded within the Site itself, or within a 1 km square that includes the Site (from TVERC) include Common and Soprano Pipistrelles *Pipistrellus pipistrellus* and *P.*

pygmaeus respectively, Brown Long-eared Bat *Plecotus auritus*, Daubenton's Bat *Myotis daubentonii* and Noctule Bat *Nyctalis noctula*. Soprano Pipistrelle, Noctule and Brown Long-eared bat are listed as s41 species on the NERC Act.

- 3.33 Additional bat species recorded within a 2 km radius of the Site include Nathusius's Pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri* and Serotine *Eptesicus serotinus*. There are records of *Myotis* species within the University grounds but not within the Site boundary or 1 km grid squares. See **Map 3b** for bat species records from TVERC.
- 3.34 The landscape surrounding the Site is mainly urban with some groups of trees, small woodlands and a large lake within the parkland of Whiteknights campus, which is likely to attract bats during summer months to feed on insects.
- 3.35 Trees were examined from the ground as to their suitability for supporting bat roosts.
- 3.36 There were holes in several of the larger trees within Woodland B which were assessed as having a Low - Moderate suitability to support roosting bats. Several of the trees within Woodland C contained holes that were assessed as showing Moderate suitability for roosting bats. There were no trees noted within Woodland D for their bat interest. The planted trees E were assessed as having a Low – Moderate suitability for bats, with features such as holes and split bark present, although they are in an exposed position in the landscape. There were features of Moderate suitability for bats within trees of Woodland F, particularly in a large Oak in the north western corner of this woodland.
- 3.37 The features themselves are already likely to be illuminated from current floodlighting, which has made them less suitable for bats than if they were dark.

Evaluation and Effects of Proposals

- 3.38 Records of bats from TVERC within the Site are of common and widespread species. Records of other bats within 2 km of the Site that are less common are mainly from within woodlands. The bat assemblage here is considered to be of Local importance.
- 3.39 The main potential effect of the proposals on bats is considered to be additional illumination from the floodlights. The likely light spill is indicated in **Appendix 1**. The local area is urban and already generally very well-lit through floodlighting from adjacent sports pitches. It is likely that bats already present on the Site are acclimatised to a well-lit environment. Although the small woodlands show features of Low - Moderate and Moderate suitability for supporting bat roosts, the increase in light spill is likely not to be significant because the sports pitches are already illuminated with temporary portable floodlights. To ensure that there is minimum light spill, the floodlights selected are fitted to reduce over spill and 0% upward light ratio (sky glow). The mast heights are a compromise to give the required minimum sports field lighting required with the minimum impact on the surrounding area. There is also a smart control unit to control the operation of the complete floodlight system. Side, rear or front cowls are to be added to the floodlight to reduce further light spill.
- 3.40 The new sports pitch would be open from 7 am -10 pm Monday to Friday and 9am - 9pm at the weekends, with the floodlighting from the new permanent structures at those times. The floodlights would be off between 10 pm and 7 am giving fairly long periods of darkness.

- 3.41 The design of the lighting and the restrictions to the times they can operate will ensure that bats are not affected by the proposals. Enhancements for bats include the provision of bat boxes in darker areas of the woodlands.

Non-flying Mammals

- 3.42 There are records of Badger *Meles meles* within Whiteknights campus, but no signs were observed within the Site itself during the survey. The closest Dormouse *Muscardinus avellanarius* record is to the south east of Whiteknights campus. It is unlikely that they are found within the small woodlands as these woodlands are isolated and have limited food sources for Dormice. There are a number of Hedgehog *Erinaceus europaeus* records, a s41 species, from the Campus, although not from the Site itself.
- 3.43 It is unlikely that these three species would be affected by the provision of an artificial sports pitch. Enhancement measures such as provision of hibernation boxes for Hedgehogs, situated within the woodlands, could be provided.

Birds

- 3.44 Birds observed within Woodland B during the survey and likely to be breeding include Great tit *Parus ater*, Blue tit *Cyanistes caeruleus* and Wren *Troglodytes troglodytes*, all common species.
- 3.45 Birds within Woodland C that are likely to be breeding include Stock Dove *Columba oenas* (one pair seen), Great Spotted Woodpecker *Dendrocopus major*, Robin *Erithacus rubecula* and Blue tit.
- 3.46 Birds noted within Woodland F included a singing Stock Dove, Wren and Jay *Garrulus glandarius*.
- 3.47 Of these, Stock Dove is listed as Amber on the list of Birds of Conservation Concern (BoCC) produced by the RSPB/BTO. It nests in the cavities of old trees, feeding within parkland areas. Records of some of the important species that have used Whiteknights Campus in the past are indicated on **Map 3d**. In addition to this passage migrants such as Pied Flycatcher *Ficedula hypoleuca*, Willow Warbler *Phylloscopus trochilus*, Wood Warbler *Phylloscopus sibilatrix*, Redstart *Phoenicurus phoenicurus* and Cuckoo *Cuculus canorus*, amongst others, have been recorded. There are records of other declining species such as Song Thrush *Turdus philomelos* and House Sparrow *Passer domesticus* which would be expected on Whiteknights Campus. The bird assemblage of Whiteknights Campus is considered to be of Local value and the conservation status of the bird assemblage as a whole as Favourable Declining.

Effects of Proposals

- 3.48 The new sports pitch is unlikely to reduce habitat for the majority of bird species as their use of the sports fields are limited. Floodlighting however is known to disrupt migrating birds, as they are attracted to, and become disorientated by high intensity lights. It also can affect the quality of breeding habitat and timing of breeding, prey availability, singing patterns and foraging. However the lighting has been designed to reduce the overspill of light as described in Paragraph 3.39 regarding bats. With this design the impact is considered to be significant at the ZoI level as the lighting could interfere with the breeding success of various species including Stock Dove.

Mitigation

- 3.49 Mitigation for species such as Stock Dove that nests in cavities in trees is installation of suitable nest boxes. One of the factors for the decline of this species is the reduction in suitable nesting areas.
- 3.50 With the above in place it is likely that the effects of the proposals on the bird assemblage will not be significant.

Invertebrates

- 3.51 Invertebrate data presented on **Map 3e** shows Stag beetle *Lucanus cervus* records from TVERC within the vicinity of the Site. Other invertebrates recorded within Whiteknights Campus that could potentially be supported by habitats on the Site include 3 Notable B beetles: *Orsodacne humerilis*, a rare beetle found on shrubs and broad-leaved trees, *Variimorda villosa*, a beetle found in trees and parkland and *Phytoecia cylindrica*, a beetle that feeds on umbellifers. There is also a record of *Nephus quadrimaculatus*, an Ivy-feeding beetle listed as vulnerable on the IUCN Red list.
- 3.52 The butterflies Small Heath *Coenonympha pamphilus*, White Admiral *Limenitis camilla*, Small Blue *Cupido minimus* and Chalkhill Blue *Polyommatus coridon* have all been recorded in the past from Whiteknights Campus. It was too early in the year to record these butterflies and none of their foodplants were recorded.
- 3.53 Invertebrates noted during the survey within Woodland D included 7-spot Ladybird *Coccinella septempunctata* and several bees nectaring on Selfheal including Red-tailed Bumblebee *Bombus lapidaries*. These are both common species.
- 3.54 The value of the invertebrate fauna supported on Site is likely to be of Local importance, however the impacts of the proposals on invertebrates is unlikely to be significant.
- 3.55 Enhancement work is recommended including:
- Leaving some areas of grassland unmown or mown once a year (for example within the buffer zone around the woodlands) to allow plants to flower and support nectaring invertebrates;
 - Creation of loggeries for Stag beetle larvae and other dead wood invertebrates within the woodlands.

Other Fauna

- 3.56 There are records of Common Toad *Bufo bufo* from the Campus, but not from the Site itself. The amenity grassland is close mown leaving very limited habitat for reptiles at the very edges of the site. There were no reptile records from TVERC.
- 3.57 Amphibians and reptiles are very unlikely to be adversely affected by the proposals.

4. SUMMARY AND CONCLUSIONS

Introduction

- 4.1 Based on the results of the Ecological Appraisal outlined above, no further survey or assessment work is recommended.

Recommendations for Impact Avoidance and Mitigation and Opportunities for Net Biodiversity Gain

- 4.2 The following summarises opportunities for incorporating impact avoidance and mitigation measures into the scheme:

- The new 3G sports pitch is angled to avoid planted trees and small woodlands, with a buffer zone of 15 m to avoid compaction to root systems;
- Floodlighting is designed to minimise light spill through:
 - Minimum mast heights for the necessary lighting;
 - Selecting floodlights that reduces the overspill of light and sky glow;
 - Provision of cowls at the rear, front or side of the lights; and
 - Controlling the lighting system with a smart control unit to ensure that curfew times are adhered to.; and
- Nest boxes for Stock Dove to be installed on suitable trees to increase nesting habitat.

- 4.3 The following are recommendations for enhancements that provide opportunities for delivering net biodiversity gains in accordance with National aspirations enshrined in the NPPF and 25 Year Environment Plan

- Grass cuttings to be piled outside of the woodlands to avoid adding nutrients to them;
- Bat boxes to provide more roosting areas to be installed on darker areas of the woodlands that will not be illuminated by the new floodlights suitable buildings;
- Installation of Hedgehog hibernation boxes within sheltered places;
- Swifts nest boxes can be installed on suitable buildings within the campus. This species has been recorded on numerous occasions within a 2 km radius of the Site (see **Map 3d**).
- Creation of loggeries within the woodlands to provide habitats for dead wood invertebrates especially Stag Beetle; and
- Less mowing of agreed demarcated areas to encourage flowering plants and nectaring invertebrates.

- 4.4 It should be noted that if the proposals in **Appendix 1** change in any way, the conclusions of this report will need to be checked to make sure that they still are correct.

Conclusions

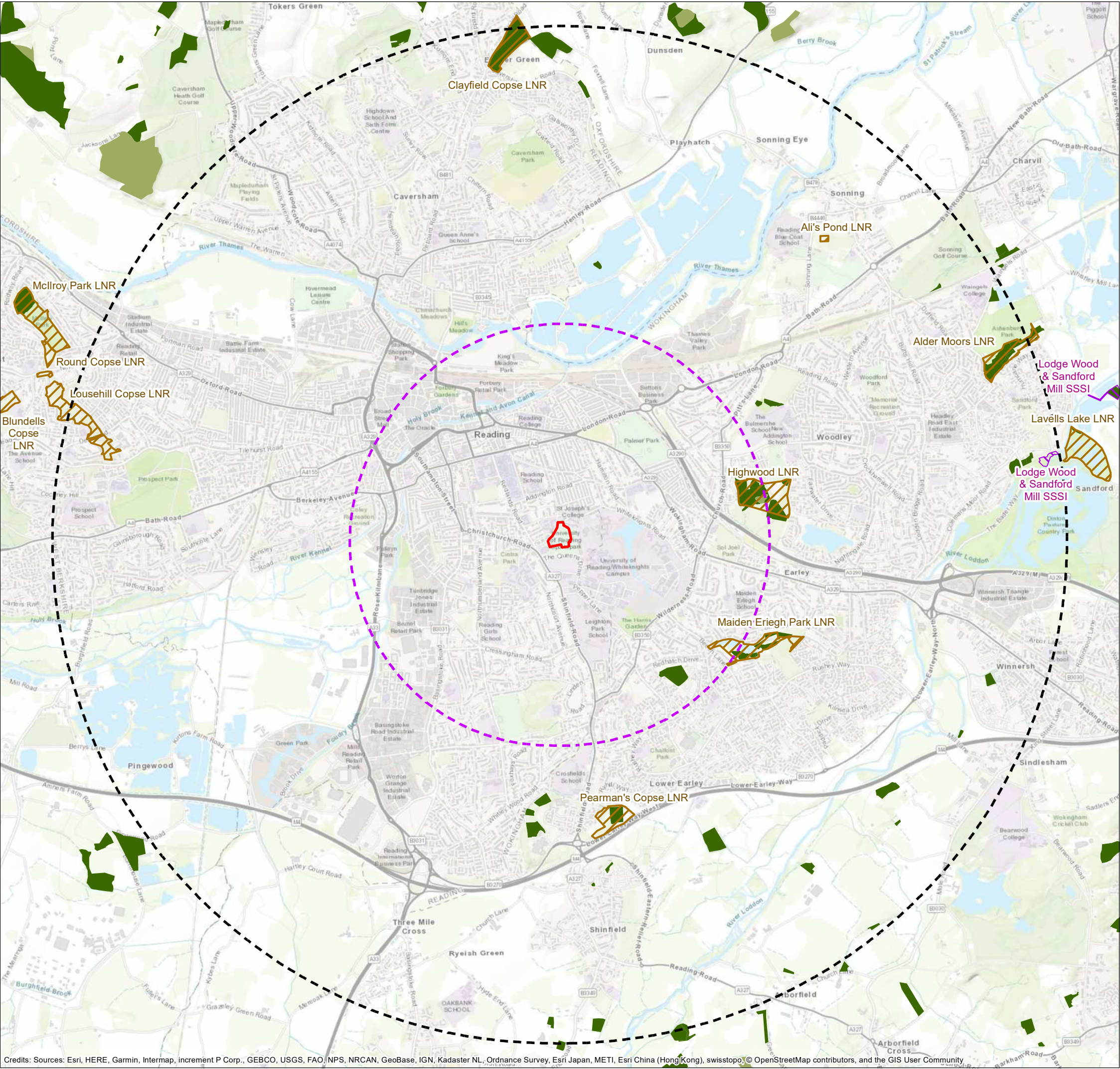
- 4.5 With the proposed mitigation in place the ecological impacts of the proposals outlined in **Appendix 1** are considered to have no significant effect on the important ecological features within the ZOI and the proposals will comply with applicable nature conservation related legislation and policy. Impacts to Species of Principal Importance for Nature Conservation (s41 species) are considered to be not significant.
- 4.6 Mitigation as part of the design and suggested enhancements are listed above, and with these in place the effects of the proposals on the ecology of the Site are considered to be neutral or positive.

5. REFERENCES

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Maps

Map 1	Statutory Designated Sites
Map 2	Policy Sites within 2 km of the Proposals including Local Wildlife Sites
Map 3a	Protected and notable species records: Flowering Plants
Map 3b	Protected and notable species records: Bats
Map 3c	Protected and notable species records: Non-flying Mammals
Map 3d	Protected and notable species records: Birds
Map 3e	Protected and notable species records: Invertebrates
Map 3f	Protected and notable species records: Amphibians
Map 4	Protected and notable species records: Habitats and Features



MAP 1 Designated Sites within 2km of the Proposals

KEY

- Site boundary
- 2km buffer of site boundary
- 5km buffer of site boundary

Legally Designated Sites

- Sites of Special Scientific Interest (SSSI)
- Local Nature Reserves (LNR)

Natural England's Provisional Ancient Woodland Inventory

- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland

SCALE: 1:38,000 at A3

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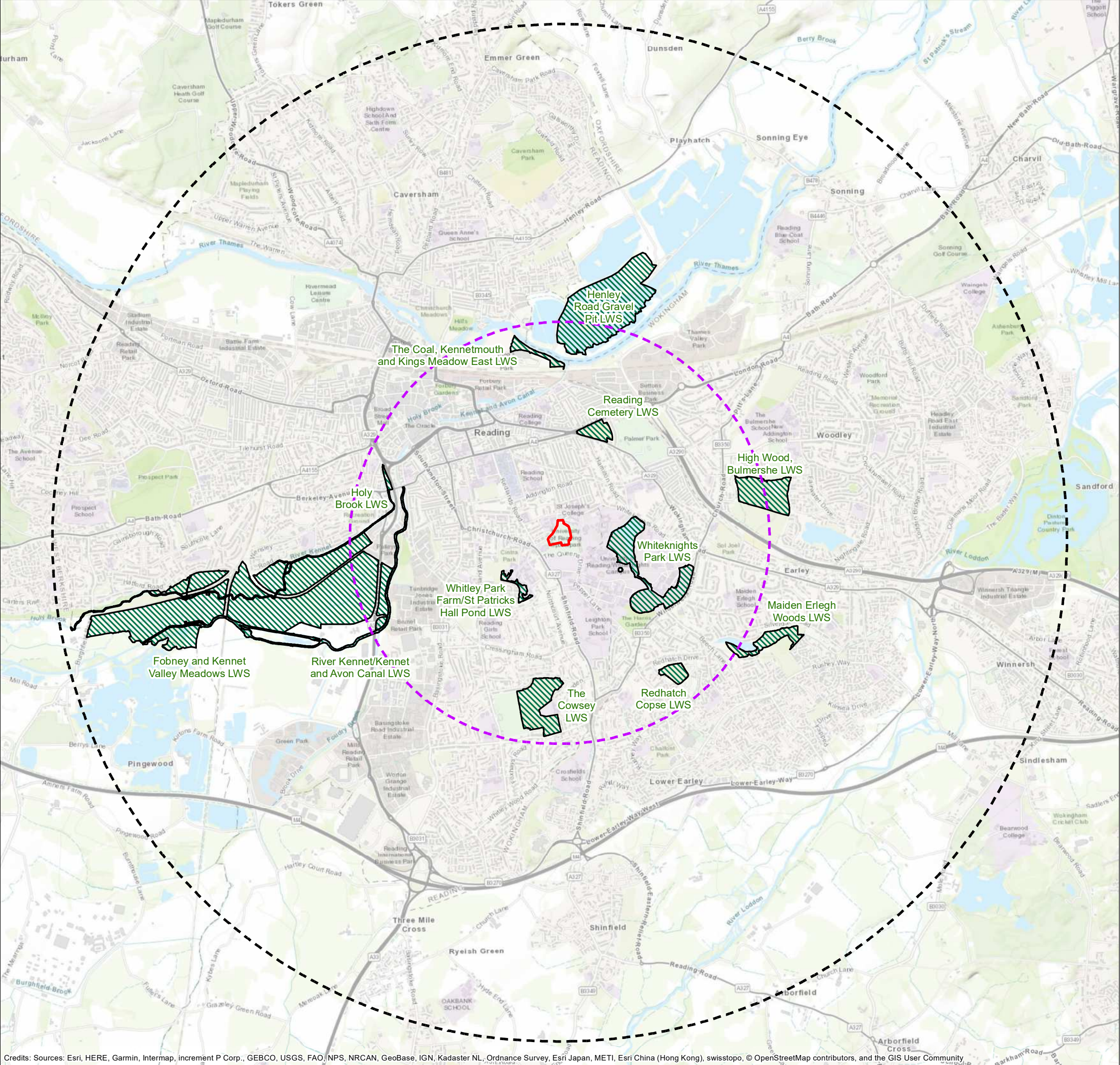


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DATE: 01 April 2019



MAP 2 Policy Sites within 2km of the Proposals including Local Wildlife Sites

KEY

- Site boundary
- 2km buffer of site boundary
- 5km buffer of site boundary
- Local Wildlife Sites (LWS)

SCALE: 1:38,000 at A3

0 500 1,000 1,500 2,000 Metres



CLIENT: University of Reading

PROJECT: UoR Whiteknights Campus Pitches

DATE: 01 April 2019

MAP 3a Protected & Notable Species -
Flowering Plants

KEY

-  Site boundary
-  2km buffer of site boundary
-  Annual Knawel
-  Bladder-sedge
-  Bluebell
-  Butcher's-broom
-  Chamomile
-  Chicory
-  Common Valerian
-  Corn Marigold
-  Corn Spurrey
-  Cornflower
-  Crosswort
-  English Whitebeam
-  Large-leaved Lime
-  Maidenhair Fern
-  Mousetail
-  Nettle-leaved Goosefoot
-  Quaking-grass
-  Sea-buckthorn
-  Stinking Chamomile
-  Summer Snowflake
-  Treacle-mustard
-  Wild Pansy
-  Wood-sorrel

SCALE: 1:16,000 at A3

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Ecological Planning & Research

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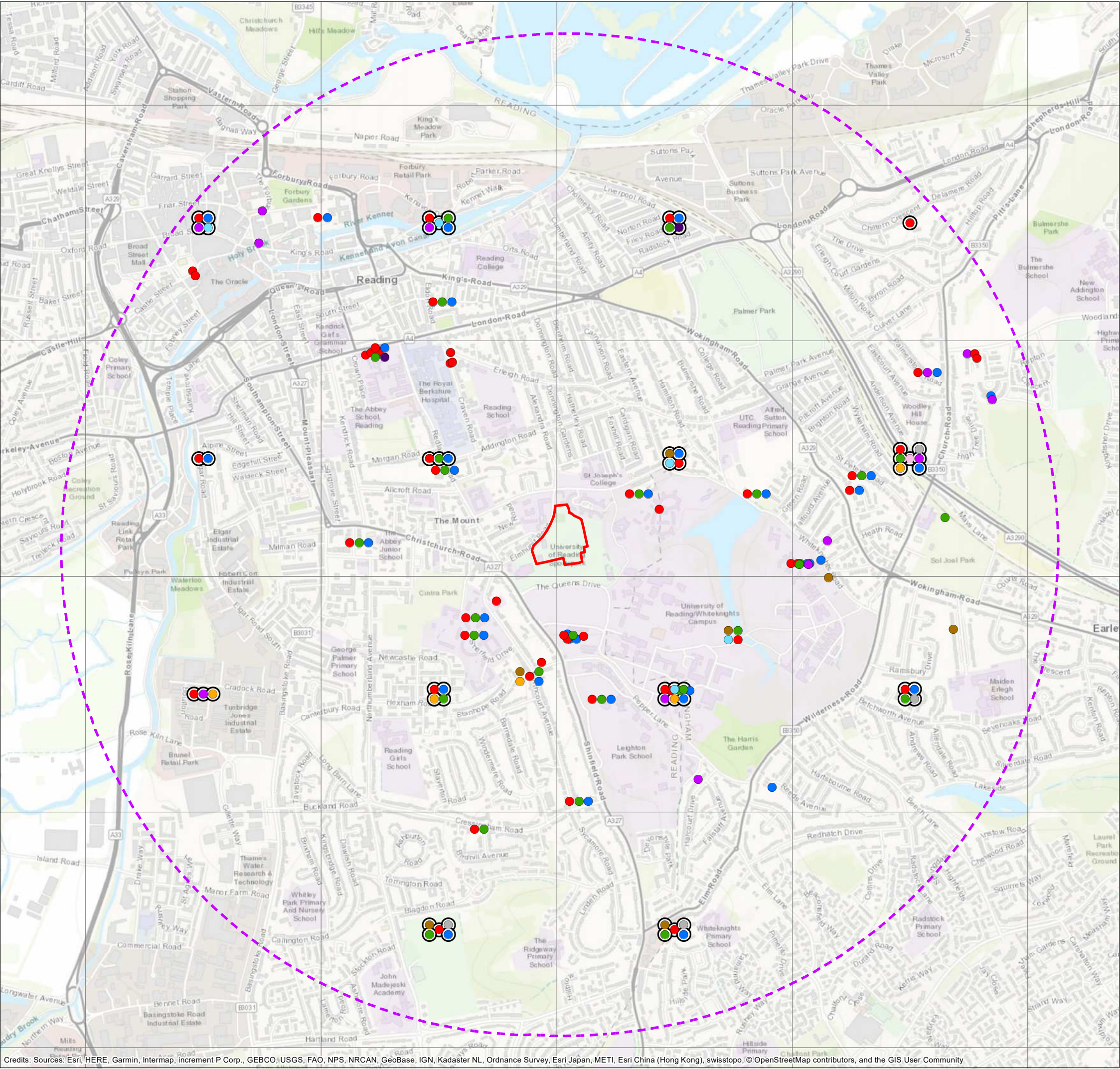
PROJECT: UoR Whiteknights Campus Pitches

DATE: 04 April 2019

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P19/18

MAP 3b Protected & Notable Species - Bats



KEY

Site boundary

2km buffer of site boundary

Brown Long-eared bat

Common Pipistrelle

Daubenton's bat

Long-eared bat species

Nathusius's Pipistrelle

Natterer's Bat

Noctule Bat

Pipistrelle Bat Species

Serotine

Soprano Pipistrelle

Record accurate to 1km grid square

1km grid

SCALE: 1:16,000 at A3

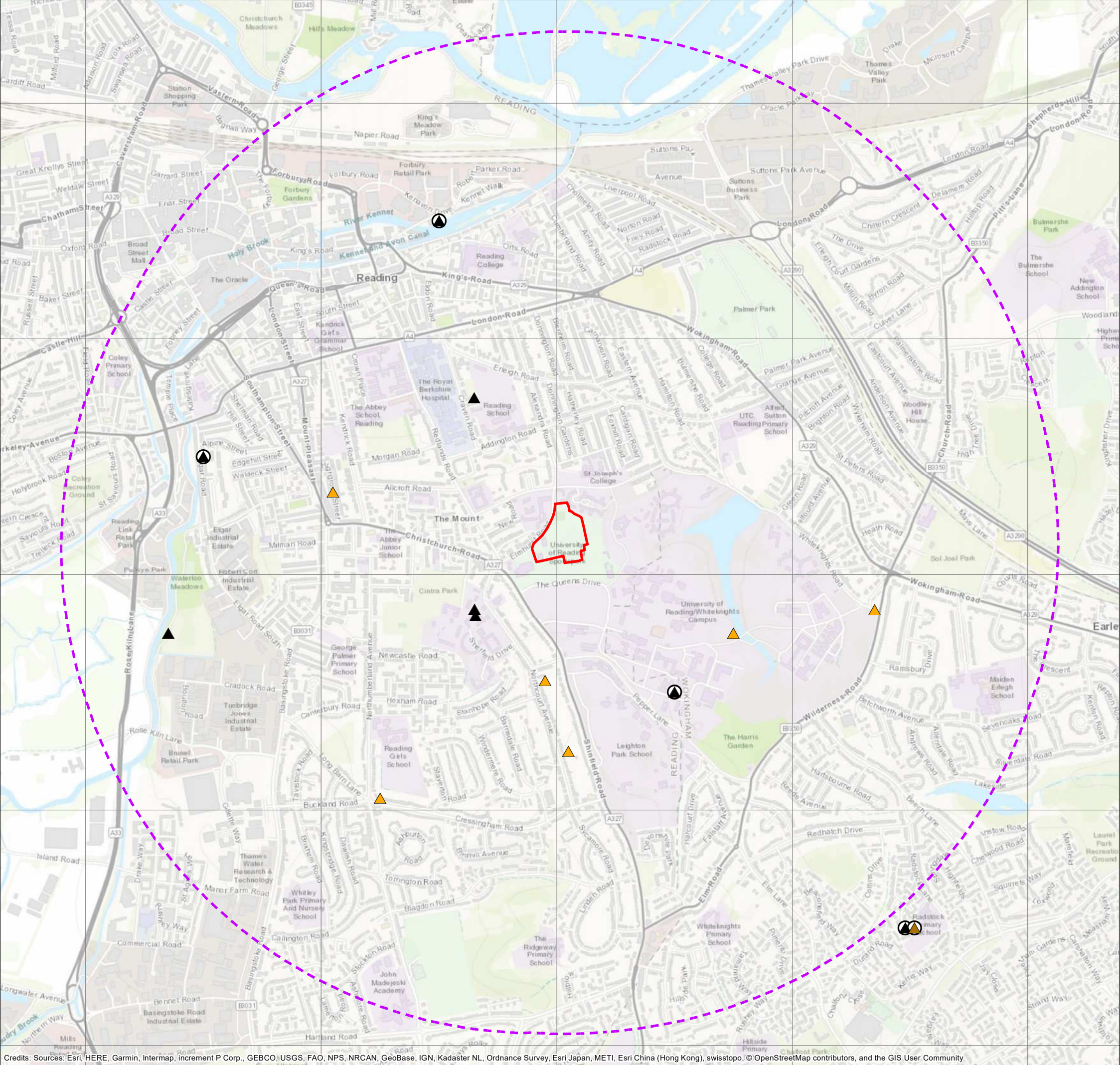
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DATE: 04 April 2019



MAP 3c Protected & Notable Species - Non-flying Mammals

KEY

Site boundary

2km buffer of site boundary

Badger

Hazel Dormouse

Hedgehog

Record accurate to 1km grid square

1km grid

SCALE: 1:16,000 at A3

0

250

500

750

1,000 Metres

N

EPR

Ecological Planning & Research

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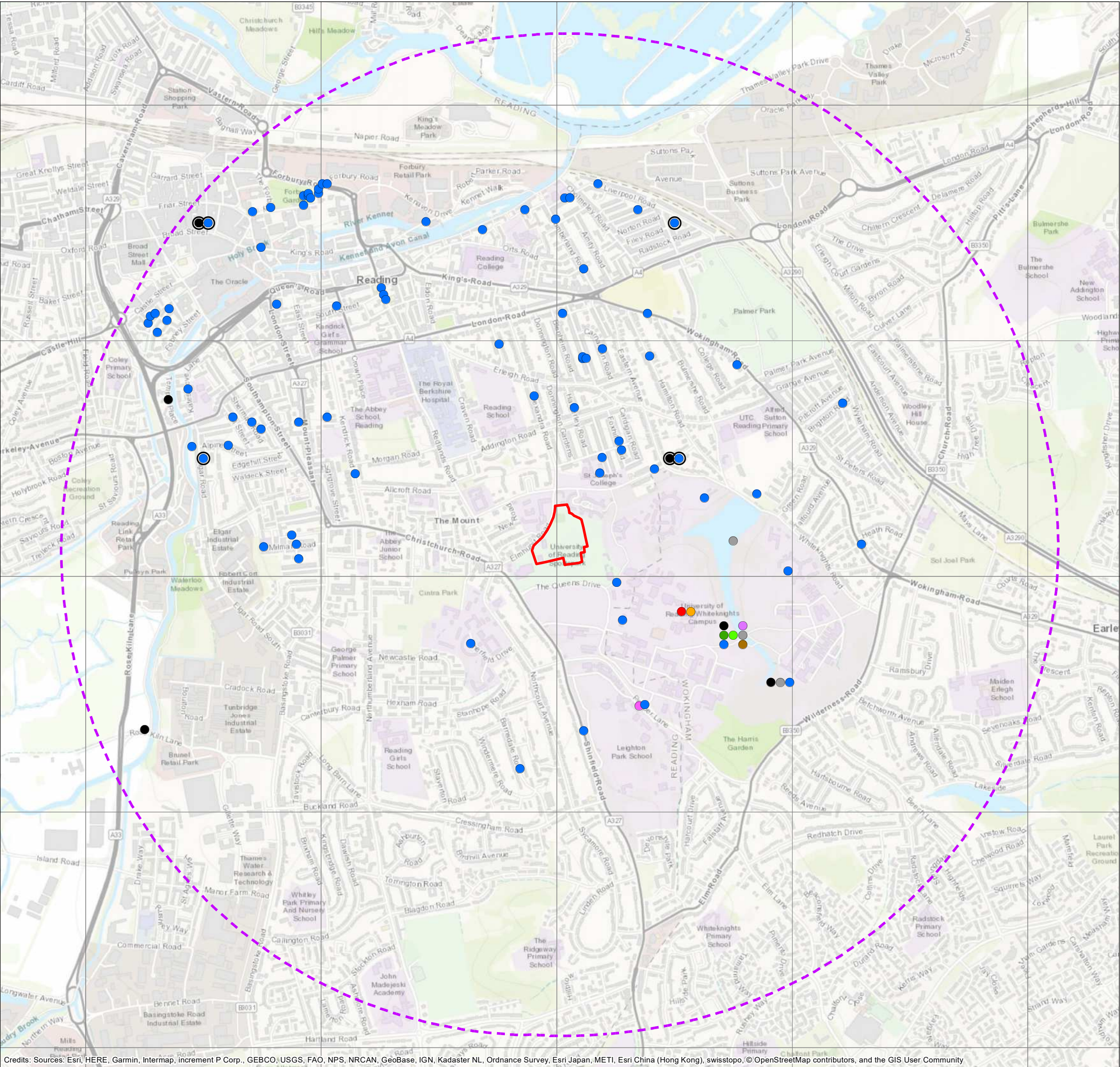
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DATE: 04 April 2019

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P19/18

Thames Valley Environmental Records Centre - TVERC/18/696



MAP 3d Protected & Notable Species - Birds

KEY

Site boundary

2km buffer of site boundary

Firecrest

Hawfinch

Hobby

House Martin

House Sparrow

Lesser Spotted Woodpecker

Spotted Flycatcher

Stock Dove

Swift

Woodcock

Record accurate to 1km grid square

1km grid

SCALE: 1:16,000 at A3

0

250

500

750

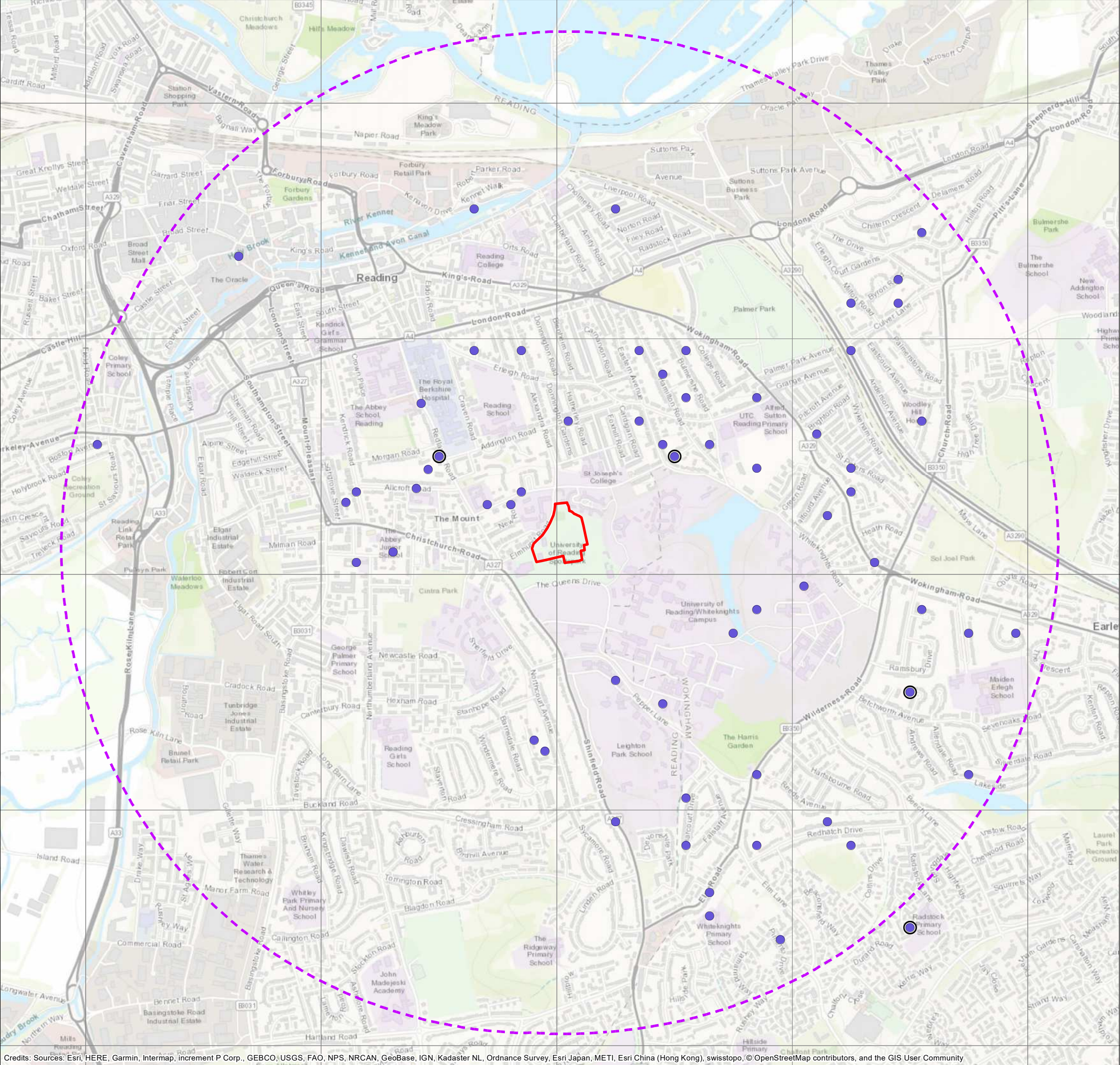
1,000 Metres



CLIENT: University of Reading

PROJECT: UoR Whiteknights Campus Pitches

DATE: 04 April 2019



MAP 3e Protected & Notable Species - Invertebrates

KEY

Site boundary

2km buffer of site boundary

Stag Beetle

Record accurate to 1km grid square

1km grid

SCALE: 1:16,000 at A3

0

250

500

750

1,000 Metres

Ecological Planning & Research

CLIENT: University of Reading

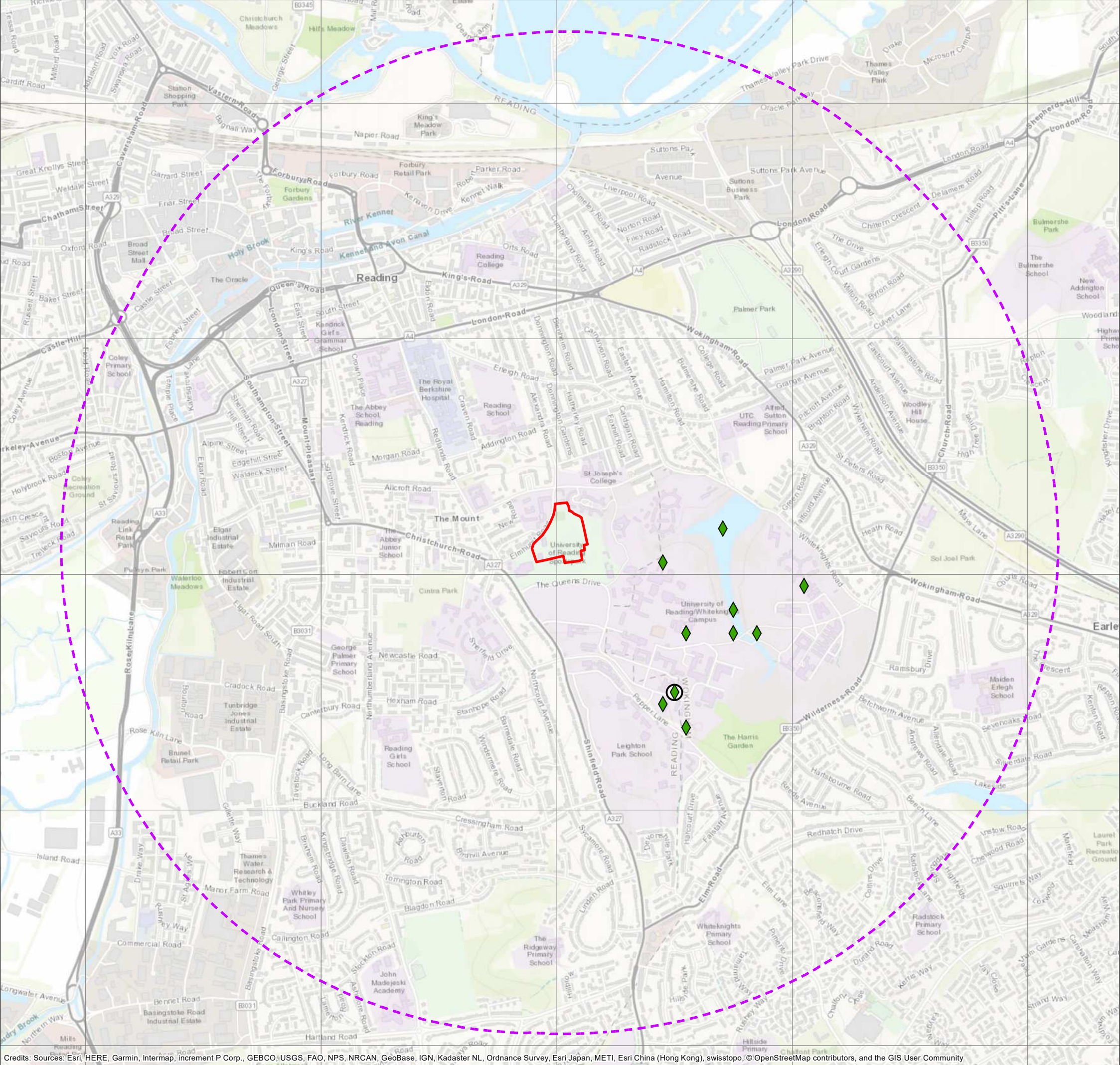
PROJECT: UoR Whiteknights Campus Pitches

DATE: 04 April 2019

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Thames Valley Environmental Records Centre - TVERC/18/696

P19/18



MAP 3f Protected & Notable Species - Reptiles & Amphibians

KEY

- Site boundary
- 2km buffer of site boundary
- Common toad
- Record accurate to 1km grid square
- 1km grid

SCALE: 1:16,000 at A3

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CLIENT: University of Reading

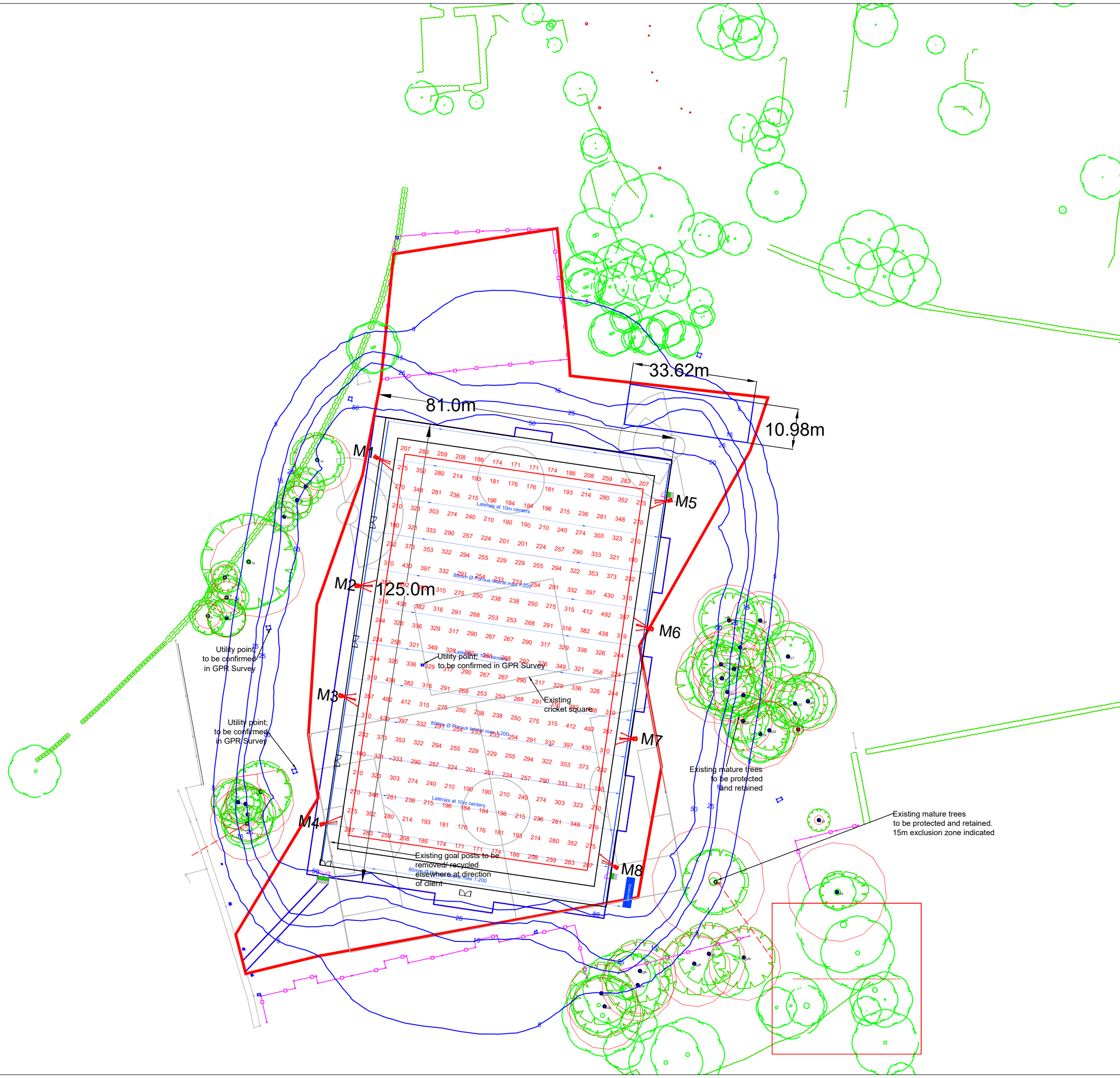
PROJECT: UoR Whiteknights Campus Pitches

DATE: 04 April 2019

Appendix 1

Indicative Masterplan

University of Reading: 3G Pitch Proposals, March 2019



Notes

It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

Synthetic Area

Length

Width

Recesses

Total Synthetic Area

- 122.0m

- 80.0m

- 65.0m at 3.0m width

- 9955m²

Playing Dimensions:

Rugby

(In accordance with World Rugby Regulation 22)

Touch-line Length

In-goal Length

Width

- 100.0m

- 6.0m

- 68.0m

(Option to reduce to 60.0m)

Football

(In accordance with FIFA Handbook of Requirements (2015))

Length

Width

- 94.0m

- 68.0m

KEY

- Building

- Roads & Footways

- Outline Proposed pitch location

- Existing outline tree canopy

- Existing socketed goal-posts

- Existing utilities

- Vegetation

- 15m exclusion zone surrounding existing mature trees

-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
A	As per 190319 RIBA 2 - Orientation Review Rev1	03/19
Rev	Description	Date
CAD file reference		DREF
Date Plotted	Time	
 University of Reading Facilities Management Directorate Whiteknights, PO Box 235, Reading, RG6 6BW Tel. 0118 378 8958 Fax. 0118 975 3499		
Consultants/Cotracotors Logo		
Building University of Reading		
Project New 3G Pitch		
Title Site Preparation		
Drawn FG	Date 03/2019	Scale 1:500@A1
Project (WSEB No.) Originator Volume Level Type Role Classification Number		Suitability Rev
XXXXXXXX-XXX-XX-XX-XX-X-XXXX-XXXXX		XX-XX

Appendix 2

Relevant Legislation & Planning Policy

LEGISLATION

Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 (known as the “Habitats Regulations”) transpose the European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the “Habitats Directive”) into UK legislation. The 2017 version consolidates the amendments made since the previous version in 2010.

The Habitats Regulations provide for the designation of both Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) in the UK, which form part of the Natura 2000 network of protected areas across Europe. The Regulations also prohibit certain actions relating to European Protected Species (EPS), which include *inter alia* Hazel Dormouse *Muscardinus avellanarius*, Great Crested Newt *Triturus cristatus*, European Otter *Lutra lutra* and all native species of bat.

Further information on SPAs, SACs and European Protected Species is provided in the relevant sub-sections of this Appendix.

Wildlife & Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 is the principal mechanism for the legislative protection of wildlife in Great Britain. Various amendments have occurred since the original enactment. Certain species of bird, animal and plant (including all of the European Protected Species listed above) are afforded protection under Schedules 1, 5 and 8 of the Act. Reference is made to the various Schedules and Parts of this Act (**Table A1.1**) in the section of this Appendix dealing with Legally Protected Species. The Act also contains measures for the protection of the countryside, National Parks, Sites of Special Scientific Interest (SSSIs) and public rights of way as well as preventing the establishment of invasive non-native species that may be detrimental to native wildlife.

Table A1.1: Relevant Schedules of the Wildlife & Countryside Act 1981 (as amended)

Schedule	Protected Species
Schedule 1 Part 1	Protects listed birds through special penalties at all times
Schedule 1 Part 2	Protects listed birds through special penalties during the close season
Schedule 5 Section 9.1 (killing/injuring)	Protects listed animals from intentional killing or injuring
Schedule 5 Section 9.1 (taking)	Protects listed animals from taking
Schedule 5 Section 9.2	Protects listed animals from being possessed or controlled (live or dead)
Schedule 5 Section 9.4a	Protects listed animals from intentional damage or destruction to any structure or place used for shelter or protection
Schedule 5 Section 9.4b	Protects listed animals from intentional disturbance while occupying a structure or place used for shelter or protection
Schedule 5 Section 9.5a	Protects listed animals from being sold, offered for sale or being held or transported for sale either live or dead, whole or part
Schedule 5 Section 9.5b	Protects listed animals from being published or advertised as being for sale
Schedule 8	Protects listed plants from: intentional picking, uprooting or destruction (Section 13 1a); selling, offering for sale, possessing or transporting for the purpose of sale (live or dead, part or derivative) (Section 13 2a); advertising (any of these) for buying or selling (Section 13 2b).
Schedule 9	Prohibits the release of species listed in the Schedule into the wild.
Schedule 9a	Allows environmental authorities to issue species control orders to landowners, obliging them to control/eradicate invasive and/or non-native species.

Further information on legally protected species, designated wildlife sites and invasive non-native species is provided in the relevant sub-sections of this Appendix.

Countryside & Rights of Way Act 2000

Many of the provisions of the Countryside and Rights of Way (CRoW) Act 2000 have been incorporated as amendments into the Wildlife and Countryside Act (1981) and some provisions have now been superseded by later legislation such as The Natural Environment and Rural Communities Act (2006).

The most relevant changes provided by the CRoW Act include the added protection given to SSSIs and other important sites for nature conservation. Importantly, under the Act it became a criminal offence to "recklessly disturb" Schedule 1 nesting birds and species protected under Schedule 5 of the Wildlife and Countryside Act. It also enabled heavier penalties on conviction of wildlife offences.

The Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities (NERC) Act 2006 was intended to raise the profile of biodiversity amongst all public authorities (including local authorities, and statutory undertakers) and to make biodiversity an integral part of policy and decision-making processes. The NERC Act also improved wildlife protection by amending the Wildlife and Countryside Act 1981.

Section 40 (S40) of the Act places a 'Biodiversity Duty' on all public bodies to have regard to the conservation of biodiversity when carrying out their normal functions. This includes giving consideration to the restoration and enhancement of species and habitats.

Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of Principal Importance for the conservation of biodiversity in England. This was published in 2007 and is commonly referred to as the "S41 list". Public authorities have a responsibility to give specific consideration to the S41 list when exercising their normal functions. For planning authorities, consideration for Species and Habitats of Principal Importance will be exercised through the planning and development control processes. Further information on Species and Habitats of Principal Importance is provided in the relevant sub-sections of this Appendix.

The Water Environment (Water Framework Directive) Regulations 2003

Currently, the overriding legislation relating to freshwater is the EU Water Framework Directive (WFD), which was enacted into law in England and Wales through the Water Environment Regulations in 2003. The Directive sets out objectives to deliver a better water environment based upon achieving a 'good status' for freshwater bodies. The new concept of 'good status' is a more rigorous measure of environmental quality than previous measures, which now takes into account not just the chemical status but also the ecological health and the extent of artificial physical modification to rivers.

The WFD is based upon the concept of protecting water through the management of river basin districts (RBDs), and requires the implementation of River Basin Management Plans (RBMPs). Regulation 17 of the WFD requires local authorities to 'have regard' of the RBMP when making planning decisions, for example through the granting of planning permission with appropriate planning conditions and/or obligations. These could require measures to be implemented (e.g. Sustainable Urban Drainage Systems (SUDS), grey water recycling etc.) or funds to be provided for habitat enhancement schemes.

The WFD also affects planning policy through the implementation of Programmes of Measures for each river basin district. This involves bringing together funding from various sources and co-ordination of the activities of organisations with an interest in the use of land and water, including developers.

SITES DESIGNATED FOR THE CONSERVATION OF NATURE

There is a hierarchy of nature conservation sites which is based on the level of statutory (legal) protection and the administrative level of importance. Other features of nature conservation interest outside designated sites may also be a material consideration in the determination of planning applications.

Statutory Sites: International

Ramsar Sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA)

The Conservation of Habitats and Species Regulations 2017 provide the primary legal basis for the protection of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in Great Britain.

SACs are sites which support internationally important habitats and/or species listed as being of Community Importance in the Annexes of the European Habitats Directive 92/43/EEC. SPAs are sites which support internationally important numbers of bird species listed as being of Community Importance in the Annexes of the European Birds Directive 2009/147/EC. Together, SACs and SPAs make up the Natura 2000 network of Sites of Community Importance throughout Europe. They are often referred to as “European sites”.

Ramsar sites are wetlands of international importance and are, as a matter of national planning policy, subject to the same strict protection as SACs and SPAs. The majority of terrestrial Ramsar sites in England are also notified as SPAs and/or Sites of Special Scientific Interest (SSSIs).

Any plan or project considered likely to affect a SAC, SPA or Ramsar site must be subject to a Habitats Regulations Assessment (HRA), as set out under Regulation 63 (and Regulation 105 in respect of Land Use Plans) of the Habitats Regulations 2017.

The local authority (or other ‘competent authority’) carries out the HRA, but the onus is on the developer to provide the necessary information to inform this process, usually in the form of a report.

Under the Habitats Regulations 2017, the competent authority must determine in the first instance whether a proposed development is likely to have a significant effect on the European or Ramsar site, either alone or in combination with other plans and projects. This stage of the HRA process is known as ‘screening’.

If a likely significant effect cannot be precluded (screened out) on the basis of objective information, the competent authority must undertake an ‘Appropriate Assessment’ to fully assess these implications against the site’s conservation objectives. A precautionary approach must be taken with respect to determining whether or not there would be a significant effect, and the appropriate nature conservation body (in most cases Natural England) should be consulted. Except in certain exceptional circumstances prescribed by the Regulations where there are imperative reasons of overriding public interest for allowing a development to proceed, the competent authority may not undertake or authorise the plan or project until they have established (based on the conclusions of the Appropriate Assessment) that the activity will not adversely affect the integrity of the European or Ramsar site. This should be the case where no reasonable scientific doubt remains as to the absence of such effects.

Statutory Sites: National

Nationally important sites include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs). A development proposal that is likely to affect a nationally important site will be subject to special scrutiny by the local planning authority and Natural England. Certain operations may be permitted. Any potentially damaging operations that could have an adverse effect directly or indirectly on the special interest of the site will not be permitted unless the reasons for the development clearly

outweigh the nature conservation and/or geological value of the site itself and the national policy to safeguard such sites, as set out in Section 15 of the National Planning Policy Framework (NPPF).

Sites of Special Scientific Interest

The Wildlife and Countryside Act 1981 (as amended) and the CROW Act 2000 provide the primary legal basis for the protection of Sites of Special Scientific Interest (SSSIs). These sites have been designated to capture the best examples of England's flora, fauna, geological or physiographical diversity.

National Nature Reserves

National Nature Reserves (NNRs) are declared under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981, as amended by the Environmental Protection Act 1990. They are managed to conserve their habitats or to provide special opportunities for scientific study of the habitats communities and species represented within them. NNRs represent the very best parts of England's SSSIs. The majority of NNRs also have European nature conservation designations.

Statutory Sites: Regional/Local

Local Nature Reserves

Local Nature Reserves (LNRs) are declared by local authorities under the National Parks and Access to the Countryside Act 1949 as living green spaces in towns, cities, villages and countryside. They provide opportunities for research and education, or for simply enjoying and having contact with nature. LNRs are usually protected from development through local planning documents which may be supplemented by local by-laws.

Non-Statutory Sites

Local Wildlife Sites

Local planning authorities may designate non-statutory sites for their nature conservation value based on important, distinctive and threatened habitats and species within a national, regional and local context. These sites are not legally protected but are given some protection through the planning system. These sites may be declared as 'County Wildlife Sites' (CWSs), 'Sites of Importance for Nature Conservation' (SINCs), or 'Sites of Nature Conservation Importance' (SNCIs) in local and structure plans. Non-statutory sites are a material consideration when planning applications are being determined. The precise amount of weight to be attached, however, will take into account the position of the site in the hierarchy of sites as set out above. Further information is typically provided in local level planning policy.

Nature Conservation in Areas Outside Designated Sites

Various other features exist outside designated sites that are important for the conservation of nature and which are a material consideration in the planning system.

Habitats of Principal Importance in England

Fifty-six habitat types have been identified as Habitats of Principal Importance for the conservation of biodiversity in England under Section 41 of the NERC Act 2006. Although these habitats are not legally

protected, the NPPF, Government Circular 06/05, good practice guidance and the NERC Act place a clear responsibility on planning authorities to further the conservation of these habitats. They can be a material consideration in planning decisions, and so developers are advised to take reasonable measures to avoid or mitigate impacts to prevent their net loss and to enhance them where possible. Additional guidance to developers is typically provided in local level planning policy.

The S41 list also includes species as explained below under 'Species of Principal Importance in England'.

Networks of Natural Habitats

Networks of natural habitats link sites of biodiversity importance and provide routes or stepping stones for the migration, dispersal and genetic exchange of species in the wider environment. Examples include rivers with their banks, traditional field boundary systems (such as hedgerows), ponds and small woods. Local planning authorities are encouraged through the NPPF to maintain networks by avoiding or repairing the fragmentation and isolation of natural habitats through planning, policies and development control.

Hedgerows

Hedgerows can act as wildlife corridors that are essential for migration, dispersal and genetic exchange of wild species. Hedgerows that qualify as a Habitat of Principal Importance under S41 of the NERC Act 2006 are a material consideration in the planning system.

Under the Hedgerow Regulations 1997, it is an offence to remove a hedgerow without submitting a notice to the Local Planning Authority and waiting for their decision. The Regulations are aimed at countryside hedges and do not apply to hedges around private dwellings or where planning permission has been granted for a project that includes hedge removal. Hedgerows that satisfy wildlife, archaeological, historical or landscape criteria qualify as 'important' under the Regulations. If a hedgerow is not important, the Local Planning Authority may not prevent its removal; however, Local Planning Authorities are required under the Regulations to protect and retain Important hedgerows unless satisfied that the circumstances justify its removal.

Tree Preservation Orders

Tree Preservation Orders (TPOs) may be declared under the Town and Country Planning Act 1990 and the Town and Country Planning (Trees) Regulations 1999 to protect individual trees and woodlands from development and cutting. TPOs are designed to preserve amenity or landscape conservation. The importance of trees as wildlife habitat may be taken into account, but alone is not sufficient to warrant a TPO. For this reason, TPOs do not fit comfortably under the remit of nature conservation and are generally dealt with by an arboricultural consultant rather than an ecologist. Further guidance on TPOs in relation to development is available from the Department for Communities and Local Government.

Ancient Woodland & Veteran Trees

Ancient woodlands are defined as areas continuously wooded for at least 400 years. Even an ancient wood which has been replanted may still have remnants of ancient woodland wildlife and historical features and has potential to be restored. Ancient woodland is not a statutory designation and does not provide legal protection, but local authorities are advised under the NPPF and National Planning Practice Guidance (NPPG) not to grant planning permission for any development that would result in

the loss or deterioration of ancient woodland or veteran trees unless under 'wholly exceptional circumstances'. Local Planning Authorities must take into account Natural England and the Forestry Commission's *Standing Advice for Ancient Woodland and Veteran Trees*.

Surface & Ground Waters

Surface waters (including flowing and standing water) and ground water can directly and indirectly impact upon the conservation of nature.

Guidance on pollution prevention is hosted on the Government's website and focuses on regulatory requirements. This covers topics including the prevention of pollution if you are a business, managing business and commercial waste, oil storage, working on or near water, and managing water on land. Careful planning and the application of these guidelines can help reduce the risk of construction and maintenance work causing pollution to surface and ground waters. Some activities with the potential to impact watercourses or groundwater may require consent under the Water Resources Act 1991.

Water Resources Act (WRA) 1991

Under the WRA there is strict regulation of discharges (including sediment, chemicals, nutrients) to rivers, lakes, estuaries and groundwaters. It also aims to ensure that polluters cover the costs associated with pollution incidents.

SPECIES PROTECTION

Legally Protected Species

The species listed in the following subsections are protected by law in England. When preparing a planning application, it is essential to determine the presence or likely absence of legally protected species and the extent to which they may be affected by a proposed development. This can best be achieved by undertaking surveys early in the planning process. Avoidance and/or mitigation measures may be required to address any predicted impacts upon protected species and may necessitate a licence. The Government website offers standing advice from Natural England and DEFRA which can be applied to planning applications that affect protected species.

Bats

There are 18 species of bat in the UK, seven of which are Species of Principal Importance in England. All bats and bat roosts are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Bats are also a European Protected Species protected under the Habitats Regulations 2017. It is an offence to:

- Intentionally or deliberately kill, injure or capture bats;
- Intentionally, deliberately or recklessly disturb bats in such a way as to be likely to significantly affect the ability of any significant group of bats to survive, breed, or rear or nurture their young or the local distribution of or abundance of a species of bat;
- Intentionally, or recklessly damage, destroy or obstruct any place used for shelter or protection (i.e. bat roosts) or intentionally or recklessly disturb a bat whilst it is occupying such a place;
- Damage or destroy a breeding site or resting place of a bat; and

- Possess, sell or transport a bat, or anything derived from it.

Development proposals affecting bats or their roosts require a European Protected Species mitigation licence from Natural England.

European Otter

The European Otter *Lutra lutra* is a Species of Principal Importance in England. It is legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded significant further protection as a European Protected Species under the Habitats Regulations 2017. Collectively, this legislation makes it an offence to:

- Intentionally or deliberately kill, injure or capture Otters;
- Intentionally, deliberately or recklessly disturb Otters in such a way as to be likely to significantly affect the ability of any significant group of Otters to survive, breed, or rear or nurture their young or the local distribution of or abundance of Otters;
- Intentionally or recklessly damage, destroy or obstruct access to places used by Otters for shelter or protection (whether they occupied or not) or intentionally or recklessly disturb an Otter whilst it is occupying such a place;
- Damage or destroy a breeding site or resting place of an Otter;
- Possess or transport an Otter (or any part thereof) unless under licence; and
- Sell or exchange otters.

Development proposals affecting the Otter require a European Protected Species licence from Natural England.

Reptiles

All four of the widespread British species of reptile, namely the Common Lizard *Zootoca vivipara*, Slow-Worm *Anguis fragilis*, Grass Snake *Natrix helvetica* (previously *Natrix natrix*) and Adder *Vipera berus*, are Species of Principal Importance in England. They are protected under Schedule 5 (Sections 9.1, 9.5a, 9.5b) of the Wildlife & Countryside Act 1981 (as amended) from intentional killing, injury and trade. The habitat of the four widespread reptiles is not legally protected; however the replacement of habitat lost through development may be required through the planning system. Mitigation for these species is not subject to licensing by Natural England but should nonetheless be planned to minimise disturbance and potential project delays.

The Smooth Snake *Coronella austriaca* and the Sand Lizard *Lacerta agilis* are the rarest reptile species in Britain. In addition to the protection that is afforded to the widespread species of reptile listed above, these species are protected further under Schedule 5 (Sections 9.4b and 9.4c) of the Wildlife and Countryside Act 1981 (as amended). They are also European Protected Species protected under the Habitats Regulations 2017. This legislation makes it an offence to:

- Intentionally or deliberately kill, injure or capture Sand Lizards or Smooth Snakes;
- Intentionally, deliberately or recklessly disturb Sand Lizards or Smooth Snakes in such a way as to be likely to significantly affect the ability of any significant group of Sand Lizards

or Smooth Snakes to survive, breed, or rear or nurture their young or the local distribution or abundance of either species;

- Intentionally or recklessly damage, destroy or obstruct any place used by Sand Lizards or Smooth Snakes for shelter or protection, or intentionally or recklessly disturb a Sand Lizard or Smooth Snake whilst it is occupying such a place;
- Damage or destroy a breeding site or resting place of a Sand Lizard or Smooth Snake;
- Keep, sell, or exchange Sand Lizards or Smooth Snakes or their eggs; and
- Deliberately take or destroy their eggs.

Development proposals affecting Smooth Snake or Sand Lizard require a European Protected Species mitigation licence from Natural England.

Water Vole

The Water Vole *Arvicola terrestris* is a Species of Principal Importance in England. The legal protection for Water Voles was increased in 2008 to fully cover the species under Section 5 of the Wildlife and Countryside Act 1981 (as amended). The legislation makes it an offence to:

- Intentionally or deliberately (but not recklessly) kill, injure or take Water Voles;
- Intentionally, deliberately or recklessly damage, destroy or obstruct access to any structure or place used by Water Voles for shelter or protection;
- Intentionally, deliberately or recklessly disturb Water Voles whilst they occupy a structure or place used for that purpose;
- Sell Water Voles or offer or expose for sale or transport for sale; and
- Possess or control live or dead Water Voles or derivatives.

Developers who wish to maintain, build on or alter areas used by Water Voles must ensure that unnecessary damage is avoided and all reasonable steps are taken to minimise impacts on Water Voles and their burrows. The Wildlife and Countryside Act provides a defence against the offences listed above, provided the action is the incidental result of an otherwise lawful operation and could not reasonably have been avoided.

A licence to displace Water Voles must be obtained from Natural England before conducting any activities involving displacement operations (this is different to a conservation licence, which is required for survey methods that involve disturbing Water Voles or their burrows, or capturing them). To obtain a displacement licence, it is necessary to demonstrate that the activity/activities will result in a conservation benefit for Water Voles.

Birds

49 species of bird are listed as Species of Principal Importance in England. All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended), making it an offence, with certain exceptions (e.g. game birds), to intentionally kill, injure or take any wild bird and to take, damage or destroy their nests or eggs.

Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) affords extra protection for certain species and applies harsher penalties for offences. Any intentional or reckless disturbance of a Schedule 1 bird, whilst it is nesting or rearing dependent young, constitutes an offence.

Regulation 10 of the Conservation of Habitats and Species Regulations 2017 requires appropriate authorities and conservation bodies, in the exercise of their functions, to take such steps that they consider appropriate in order to secure “*the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat (...)*”.

European Badger

The Protection of Badgers Act 1992 offers considerable protection to both badgers and badger setts. This legislation was enacted to protect the European Badger *Meles meles* against baiting and not as a means of species recovery as it is common in England. It is an offence to cruelly treat, kill or take Badgers, but it is also illegal to intentionally or recklessly damage or disturb a badger sett while it indicates signs of current use by a Badger.

The Government website contains information to help developers and their proponents avoid sett disturbance and to identify setts that are in current use. It is important to maintain adequate foraging territory in development proposals affecting badgers as the destruction or severance of large areas of foraging territory could also be taken to include habitat loss. Licences to disturb Badgers and their setts in respect of development may be issued by Natural England provided provisions are made to minimise disturbance.

Wild Mammals

All wild mammals are protected against cruelty under the Wild Mammals (Protection) Act 1996, which makes it an offence to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

White-Clawed Crayfish

The White-Clawed Crayfish *Austropotamobius pallipes* is a Species of Principal Importance in England. Outside designated sites (e.g. SACs), the White-Clawed Crayfish receives limited protection under Schedule 5 (Sections 9.1, 9.5a and 9.5b) of the Wildlife and Countryside Act 1981 (as amended), the Habitats Regulations 2017 and the Salmon and Freshwater Fisheries Act 1975. This legislation does not provide strict protection of individual crayfish or their habitats but it does prevent prohibit the capture of this species without a licence. A conservation licence must therefore be obtained from Natural England before conducting any mitigation involving the capture and handling of this species.

European Eel

The Eels Regulations 2009 (as amended in 2011) aim to combat the population decline of the European eel *Anguilla anguilla* through protection of migration routes and controls on the numbers of eels allowed to be taken. So as to protect migration routes, any structures which may prevent upstream or downstream migration of eels must be reported to the Environment Agency. Eel passages must be constructed where needed and maintained in a good condition.

Freshwater Fish

The Salmon and Freshwater Fisheries Act 1975 protects freshwater fish, particularly salmon and trout. It prevents the destruction of spawning grounds and the obstruction of migratory passages through the building of weirs, dams etc.

Licences for Development

Licences are required to permit activities prohibited under wildlife legislation, namely the disturbance or capture of protected species or damage to their habitats. Natural England is the licensing authority in England. Licences are only issued for certain purposes, which are set out in the legislation, and only where there is a valid justification. The licences most relevant to development scenarios are discussed below.

European Protected Species Mitigation Licences

A European Protected Species mitigation licence (EPSL) is required from Natural England to undertake any development that is reasonably likely to result in an offence in respect of a European Protected Species protected under Schedule 2 of the Habitats Regulations 2017; including inter alia all species of bats, Hazel Dormouse, Great Crested Newt and European Otter. Natural England must be satisfied that the following three tests are satisfied before it will issue a licence covering a European Protected Species:

1. The proposal is necessary to preserve 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;
2. There is no satisfactory alternative; and
3. The proposal will have no detrimental effect to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Conservation Licences

In the context of development, conservation licences are normally only relevant to mitigation involving the capture of Water Voles or White-Clawed Crayfish. Conservation licences are granted to permit the trapping and translocation of these species on the condition that the development activity is properly planned and executed and thereby contributes to the conservation of the population of the species.

Badger Licences

Licences to disturb Badgers and their setts in respect of development may be issued by Natural England, provided provisions are made to minimise disturbance.

Species of Principal Importance in England

943 species have been identified as being of Principal Importance for the conservation of biodiversity in England under Section 41 (S41) of the NERC Act 2006. The S41 list includes species found in England which have been identified as requiring action under the now superseded UK Biodiversity Action Plan 2007 (plus the Hen Harrier). While many of these species may not be legally protected (some are protected under the legislation described above), there is a clear responsibility on local planning authorities to further their conservation. These species can be a material consideration in development

control decisions and so developers are advised to take reasonable measures to avoid or mitigate impacts to prevent the net loss of these species, and to enhance their habitats where possible. Additional guidance to developers is typically provided in local level planning policies.

Invasive Non-Native Species

There are a number of species not ordinarily resident in the UK, such as Japanese Knotweed. Those which pose a significant threat, if uncontrolled, to our ecology and economy are listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). For an offence to be committed, a species must be released or allowed to escape into the wild. For example, if a plant listed on Schedule 9 is not adequately controlled by a land owner, once they are aware that it is present, and the species is allowed to spread into adjoining areas, then this could constitute an offence.

Species Control Orders

A new schedule 9A was inserted into the Wildlife and Countryside Act 1981 (as amended) by Sections 23 to 25 of the Infrastructure Act 2015. This gives environmental authorities (in England the Secretary of State, Environment Agency, Natural England and the Forestry Commission) the power to offer 'species control agreements' to landowners in respect of invasive and/or non-native species, such as Japanese Knotweed. If the landowner does not comply with a species control agreement, or refuses to enter into one, the environmental authority may issue a 'species control order', requiring the owner to eradicate or control the species, or to allow the environmental authority access to carry out these operations themselves.

If the owner does not comply with the species control order, the maximum penalty if convicted is a fine of up to £40,000 and/or imprisonment for up to 51 weeks. The environmental authority can also recover costs for carrying out the necessary work themselves.

PLANNING POLICY & GUIDANCE

This section set out the main planning policy and government guidance that relates to the conservation of nature at all levels of government.

National Level

National Planning Policy Framework 2018

The National Planning Policy Framework (NPPF) 2018 sets out the Government's planning policies for England and how these should be applied in local-level policy and decision making. The NPPF has a clear "presumption in favour of sustainable development" (paragraph 11), with economic, social and environmental objectives. This does not apply where development requiring Appropriate Assessment under the Habitats Directive is being planned or determined (paragraph 177).

Section 15 of the NPPF provides guidance on conserving and enhancing the natural environment through the planning system, as summarised below.

Firstly, planning policies and decisions should contribute to and enhance the natural and local environment by applying the following key principles:

- protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; and
- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Section 15 also requires planning policies and decisions to limit the impact of artificial light pollution on nature conservation.

Secondly, when determining planning applications, local planning authorities should apply the following key principles:

- if significant harm resulting from a development cannot be avoided, adequately mitigated or (as a last resort) compensated for, then planning permission should be refused;
- proposed development that is likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should normally be refused;
- planning permission should normally be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and aged or veteran trees, unless there are 'wholly exceptional reasons' and a suitable compensation strategy exists; and
- 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.

In the case of SSSIs and irreplaceable habitats, exceptions may be made if it can be clearly demonstrated that the benefits of the development, in that location, clearly outweigh the costs in terms of loss or adverse impacts.

Section 15 specifies that listed or proposed Ramsar sites, potential European sites, and sites identified or required as compensatory measures for adverse effects on designated/listed or potential/proposed European and Ramsar sites should be given the same protection as designated European sites.

Section 15 includes the following text on air quality:

- Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas;

- Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications; and
- Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

The NPPF also sets out principles for plan-making, including the allocation of land with the least environmental or amenity value, and taking a strategic approach to maintaining and enhancing networks of habitats and green infrastructure by identifying, mapping and safeguarding components of local wildlife-rich habitats, wider ecological networks, wildlife corridors and stepping stones, and those areas identified by national and local partnerships for habitat management, enhancement, restoration or creation.

Government Circular 06/05: Biodiversity and Geological Conservation

The Government produced Circular 06/05 to provide guidance on the application of the law to the conservation of nature. Although the document is in the process of being updated, Paragraphs 98 and 99 remain relevant as they set out the following principles and obligations:

- The presence of protected species is a material consideration when determining a development proposal;
- Local authorities should consult with Natural England before granting permission, and consider imposing planning conditions or obligations to secure the long-term protection of the species;
- The presence or otherwise of protected species, and the extent to which they may be affected by the proposed development, must be established before permission is granted;
- Given the delay and cost that may be involved, developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and affected by the development.

DCLG Planning Practice Guidance

Revised and updated Planning Practice Guidance (PPG) was launched by the Department for Communities and Local Government (DCLG) as a web-based tool in March 2014 to accompany the NPPF. The webpages are set out in a Q&A format. The PPG consolidates and supersedes existing guidance on a range of planning-related topics, clarifies some of the statements made in the NPPF, and provides links to relevant legislation and other sources of advice.

The Guidance outlines a number of important principles in relation to nature conservation and biodiversity, including the need to integrate biodiversity into all stages of the planning process and to consider opportunities to enhance biodiversity and contribute to the Government's commitments and targets set out in *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*.

The guidance also requires that "an ecological survey will be necessary in advance of a planning application if the type and location of development are such that the impact on biodiversity may be significant and existing information is lacking or inadequate", and recommends that "local planning

authorities should only require ecological surveys where clearly justified, for example if they consider there is a reasonable likelihood of a protected species being present and affected by development.”

Other guidance

In addition to the Planning Practice Guidance, various other forms of guidance and standards are available in relation to biodiversity and the development process. Of particular note is *British Standard BS42020:2013 Biodiversity – Code of practice for planning and development*, published in August 2013, which replaces *Planning to Halt the Loss of Biodiversity (PAS 2010): Biodiversity conservation standards for planning in the United Kingdom*.

This document is designed to complement the NPPF and is aimed at organisations concerned with ecological issues throughout the planning process, including local authorities, developers, planners and ecological consultants. It sets out step-by-step recommendations on how to incorporate biodiversity considerations at all stages of the planning process, with a focus on the provision of consistent, high quality and appropriate ecological information, effective decision making, and high standards of professional conduct and competence.

Regional Level

Regional plans (such as the South East Plan Regional Spatial Strategy) have been revoked, but some specific policies have been saved. The only policy saved from the South East Plan is Policy NRM6, which relates to the Thames Basin Heaths Special Protection Area (TBH SPA).

Local Level

Reading Borough Council is the relevant planning authority. Relevant policies include:

Policy CS36: Biodiversity and Geology

- a) ‘Development should retain, protect and incorporate features of biodiversity or geological interest (including protected species and their habitats) found within the application site into their schemes’.

The policy states that where there is recognised biodiversity/geological value, development will not be permitted where there would be a direct or indirect adverse impact on the site, unless it can be demonstrated that:-

- i) Development need outweighs the need to protect site value; and
 - ii) Appropriate compensation, impact minimisation, mitigation and compensation are provided.
- b) Local Nature Reserves and Wildlife Heritage Sites (WHS) will be safeguarded and where possible enhanced. Planning permission will not be granted for development that would adversely affect a designated nature reserve or WHS.
- c) Development that would sever or threaten the integrity of an established wildlife link as shown on an adopted proposals map, will not be permitted. Where applicable, developments should be designed to protect, consolidate, extend and enhance the network of wildlife links and corridors in and adjoining the Borough, working with neighbouring authorities where appropriate.

The policy states that a balance needs to be made between allowing development and preserving the natural environment, and that while 'inappropriate forms of development will be resisted in accordance with PPS 9', there may be situations where alternative sites cannot be identified and development may need to proceed. In these circumstances, features should be retained, incorporated and where possible, enhanced, and compensation and mitigation should be implemented where appropriate.

Reading Borough contains many sites that are important to the local and strategic context, which need to be protected, although it does not contain any nationally or internationally designated conservation sites. Protected species identified in the Reading Biodiversity Action Plan (BAP) – see below – should also be protected from any direct or indirect harm resulting from development.

The nature conservation value of LNRs and WHSs will also be maintained and managed so that they are protected against adverse effects of development.

Fragmentation and isolation of natural habitats should be avoided, with biodiversity networks protected from development and where possible, strengthened. Proposals which are likely to have an adverse impact on the function of wildlife corridors will therefore be refused permission.

Policy CS38: Trees, Hedges and Woodlands

'Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal, and the Borough's vegetation cover will be extended'.

'The nature conservation value of woodlands will be protected and their quality enhanced, wherever possible. Enhancement and extension of woodlands will be achieved in conjunction with relevant development proposals and may include measures such as new planting and management plans. Effective management of new woodland areas will be promoted'..

Currently trees are protected through Tree Preservation Orders (TPOs). Significant trees will be protected in conjunction with new developments.

The targets of this policy is to continue retaining trees, hedgerows and woodlands

and to increase woodland cover across the Borough.

BIODIVERSITY PLANS AND STRATEGIES

The NERC Act 2006 places a duty on local authorities to have due regard to biodiversity when exercising their normal functions, and the NPPF requires planning policies to "promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species, and identify and pursue opportunities for securing measureable net gains for biodiversity" (paragraph 174). These targets are set out in a range of biodiversity plans and strategies from the international through to the district level.

An overview of the key biodiversity plans and strategies in the UK, and their implications for development, are set out below.

National level

The *UK Biodiversity Action Plan 2007* (UK BAP) has been superseded by the *UK Post-2010 Biodiversity Framework* and individual national biodiversity strategies. The UK Framework sets out the overarching vision, strategic goals and priority activities for the UK's work towards international biodiversity targets (known as the 'Aichi Targets'), as agreed by 192 parties at the UN Convention on Biological Diversity in 2010.

In England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* is the national biodiversity strategy, which has the stated mission "(...) to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people." In order to focus activity and assess performance in achieving this mission, Biodiversity 2020 sets out objectives relating to terrestrial and marine habitats and ecosystems, species and people.

Local level

While BAPs at the national level have now been superseded by *the UK Post-2010 Biodiversity Framework* and *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*, many county and district level BAPs still exist.

'The Natural Environment in Berkshire – Biodiversity Strategy 2014 – 2020' is a statement on the current state of nature in Berkshire and a strategy for protecting and enhancing its natural environment. This builds on and replaces the Berkshire Biodiversity Action Plan. Relevant national outcomes are:

Outcome 1 – Habitats and Ecosystems on Land

- A. Better wildlife habitats with 90% of priority habitats in favourable / recovering condition, at least 50% of SSSIs in favourable condition, while maintaining at least 5% in favourable / recovering condition.
- B. More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in overall extent of priority habitats.
- C. At least 17% of land and inland water conserved through effective, integrated and joined up approaches to safeguarding biodiversity and ecosystem services
- D. Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaption.

Outcome 3 – Species

An overall improvement of the status of wildlife, preventing further human-induced local extinctions.

Relevant Berkshire objectives to forward these outcomes include:

Objectives for Habitats

- 1.1 Devise a method to record the condition of Berkshire's priority habitat outside of designated sites

- 1.2 Record & report on the condition of Berkshire's Priority habitat outside of designated sites on an annual basis.
- 1.4 Increase habitat connectivity by encouraging targeted habitat creation within the BOAs
- 1.7 To ensure the Local Wildlife System is maintained and improved upon.
- 1.8 Promote the use of BOAs when guiding nature conservation effort and spending.

Objectives for Species

- 2.1 Maintain species records and encourage local recording
- 2.2 Identify key species for Berkshire where specific objectives would assist with species objective plans
- 2.3 Promote implementation of the Invasive Non-Native Species Framework strategy.

Delivering Net Gain

Opportunities should also be sought to achieve a net gain (i.e. enhancement) of biodiversity. Support for biodiversity enhancement is provided in the Public Authority 'Biodiversity Duty' under the NERC Act 2006 and in the key principles of the NPPF, and increasingly in local level planning policy.

Enhancement projects may not just benefit biodiversity. There are many functional benefits to be won from strategically planned green infrastructure projects such as semi-natural urban green spaces, sustainable urban drainage schemes (SUDS) and green roofs. Planning conditions and obligations are increasingly being used to mandate biodiversity enhancement on or off a development site, either through design or financial support.

Appendix 3

Ecological Appraisal Methodology

This Ecological Appraisal has been completed following guidance in The Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2018).

DESK STUDY METHODOLOGY

A desk study was carried out in order to gather and refer to existing biodiversity and contextual information with respect to the zone of influence and the wider area. This involved interrogation of internet resources, including the Multi-agency Geographic Information for the Countryside (MAGIC) and National Biodiversity Network (NBN), aerial photos, current Ordnance Survey maps and historical maps. Reference was also made to local planning policies, strategies and initiatives relating to biodiversity.

A request was made to Thames Valley Environmental Records Centre (TVERC) for any existing biological records in the databases. The local records search and other desktop research was over a 2km radius for nationally and locally important features and European Protected Species, and a 5 km radius for sites of European significance.

FIELDWORK METHODOLOGY

The field survey was completed by Helen Demopoulos on 27 March 2019. The perimeter of the Site and the sports field and immediately surrounding land was walked, recording habitats and features of potential value to wildlife and any evidence of, or potential for, protected or notable species or habitats, in accordance with the methods described below.

Land Use, Habitat Types, Vegetation Communities and Flora

Within the study area the land use, habitat types and landscape features (such as hedgerows and veteran trees) were described and mapped. For each main habitat type the dominant vegetation communities were recorded, along with any notable or indicator plant species, (including invasive species such as Japanese Knotweed where present). A preliminary evaluation of the structure, quality and likely management of each habitat or feature was also carried out.

The survey method used to record this information was based on Phase 1 Habitat Survey methodology (JNCC 1993). Botanical nomenclature in this report follows Stace (2010).

Fauna

The potential for habitats and features to support protected or notable species, or species of principal importance for the purpose of conserving biodiversity, were recorded, as were any signs encountered. The following is a summary of the approach taken for this Ecological Appraisal.

Badgers

Consideration was given to the presence of habitat potentially suitable for supporting Badgers, including woodland and grassland. Potential evidence of the presence of Badgers was looked out for and noted, including earthworks that might be Badger setts, and signs such as dung pits, mammal pathways through ground vegetation and under fences, and hairs on fences.

Bats

Bats use buildings and trees for roosting and breeding and, where present, a preliminary assessment of the potential for these features to support bats was undertaken during the survey. Potential may include gaps beneath roof or hanging tiles, in soffits, or beneath the end of ridge tiles, but also under the edge of felt on flat roofs. In trees potential roosting features include woodpecker holes, splits in branches and peeling bark.

Preliminary evidence was obtained through noting any staining around potential roost entrances, and looking for bat droppings, for example on window sills. A preliminary evaluation was also undertaken of potential bat foraging habitat in the area, including woodland, pasture, hedges and watercourses.

Dormouse

The type and quality of habitat with the potential to be suitable for supporting Dormice, such as woodland and hedgerows, was considered during the survey. In particular the presence of oak, hazel and berry-bearing shrubs was noted, and the connectivity of habitat recorded.

Birds

Any birds seen whilst carrying out the survey were recorded, and the type and quality of habitats available for birds was considered, including vegetation suitable for nesting, and habitat with the potential to support valued species, including breeding and wintering birds.

Amphibians

Consideration was given to the presence of habitat potentially suitable for supporting amphibians, including water bodies (ponds, ditches), woodland, scrub and rough grassland, and features such as log piles that might provide hibernation areas. Where appropriate, effort to gather direct evidence of amphibians was undertaken by making a preliminary search for eggs by examining vegetation within reach of the margins of water bodies, and for resting animals on land by looking under potential refuges, such as stones, wood and rubbish near to water bodies.

Reptiles

The presence and quality of habitat considered potentially suitable for supporting reptiles was recorded. This included areas providing basking and foraging areas, hibernation and breeding sites, such as rough grassland and scrub, banks, burrows, rubble piles, compost heaps, hedgebanks and water bodies.

Invertebrates

Readily identifiable invertebrates seen during the survey were recorded, and habitats and features likely to support noteworthy groups and species were noted, for example herb-rich grasslands, areas of bare ground and deadwood habitats, including woodland and veteran trees.