Whiteknights Dam, Reading, Berkshire

Ecological Appraisal

On behalf of **Reading Borough Council**

Project Ref: 27560_4001 | Rev: AA | Date: October 2015

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Executive Summary

Peter Brett Associates LLP (PBA) were commissioned by Reading Borough Council (RBC) to carry out a study on the Whiteknights Lake earth embankment dam in Reading to determine appropriate modifications for the allotments side of the embankment crest and downstream slope to ensure that it can withstand the probable maximum flood (PMF) without damage, whilst the PMF is safely passed downstream. Whiteknights Lake is classified as a large raised reservoir under the Reservoirs Act 1975.

The site which was the focus of this ecological appraisal is the land which is most likely to be directly affected by the modifications.

The desk study undertaken to inform this ecological assessment highlighted the presence of a non-statutory Local Wildlife Site (LWS) (Whiteknights Park) as well as a number of records of protected species and species of conservation importance including invertebrates, amphibians, reptiles, birds and bats within the area up to 2 km from the site. An extended Phase 1 habitat survey found the site to be dominated by amenity grassland, introduced shrub, dense scrub and tall ruderal vegetation and allotment gardens, with scattered native trees (subject to Tree Preservation Orders), native species-poor hedgerow, standing water and associated marginal vegetation.

Taking the results of the desk study exercise and field survey in combination (particularly with regards to protected and notable species), follow-up survey work was carried out at the site over the summer 2015. This determined that there is no evidence of bats using the tree with bat roosting potential within the site and also determined that the mammal burrow within the site (thought to be created by a fox) was not in current use. Recommendations have been made in the light of the results of the desk study, extended phase 1 survey and follow-up survey work to minimise ecological impacts and ensure avoidance of contravention of wildlife legislation; these include:

- The adherence to appropriate pollution prevention guidelines during construction works particularly with regard to Whiteknights Lake to the south;
- Protection of retained trees and hedgerows through adequate root protection zones (during development) in accordance with BS 5837: 2012 Trees in Relation to Construction – Recommendations (as a minimum). Permission will be required from Reading Borough Council for any works affecting trees given the Tree Preservation Orders protecting trees on the downstream face of the embankment;
- A precautionary working method, supervised by an ecologist and detailed in the recommendations of this report, should be adopted in relation to reptiles and common toads to ensure that killing/injury is avoided;
- To avoid impacts on nesting birds, vegetation clearance works should avoid the bird nesting season (March-August inclusive as a guide); if this is not possible, clearance work should only be undertaken with an ecological watching brief. In the event that nesting birds were found to be present, the clearance work would need to cease until the young had fledged;
- Whilst follow-up survey work found no evidence of roosting bats within the site, there are features supported by the trees within the site suitable for bats to use on a transient basis. If affected by the proposed development, the trees within the site should be soft-felled in the presence of a bat licenced ecologist, in accordance with guidance from Bat Conservation Trust relating to works affecting Category 2 trees (Hundt, 2012);
- The fox earth was back-filled once current use was ruled out by camera-trap surveys on the advice of the ecologist and the All Reservoirs Panel Engineer, to help ensure the integrity of the earth embankment. Working measures are recommended to avoid foxes (known to be present in the area) becoming trapped in any open excavations during the works.

Providing these measures are adhered to there are no overriding legislative reasons relating to these sites/protected species that would prevent the proposed works. In the event that Reading Borough Council are seeking enhancements as part of the scheme design, consideration could be given to the provision of bat boxes on retained trees.

1 Introduction

1.1 Site Description

1.1.1 The site which is the subject of this report encompasses a small allotment and an area of land within the grounds of the Lakeside Residential Care Home associated with Whiteknights Lake, covering an area of approximately 0.9 ha. Whiteknights Road runs from east to west through the southern half of the site, effectively across the top of the dam. The central grid reference of the site is SU 738 723 and it lies in the south-east of Reading to the north of the University of Reading. The site is bordered to the east by the rear gardens of residential properties, to the north by further residential development and amenity grassland playing fields and to the west by the remainder of the Lakeside Residential Care Home. Whiteknights Lake (in the grounds of Reading University), part of the non-statutory designated Local Wildlife Site (LWS) Whiteknights Park, lies to the south/south-east of the site.

1.2 Project Description

1.2.1 Reading Borough Council (RBC) proposes to undertake works within the site to ensure that the existing spillway of the Whiteknights Lake can safely pass the probable maximum flood without damage. It is understood that the works may be subject to a planning application, dependent on the final design for the scheme and whether trees supporting Tree Preservations Orders within the site will be affected by the proposals. In addition, the work has to be certified by the All Reservoirs Panel Engineer (Qualified Civil Engineer) under the Reservoirs Act 1975.

1.2.2 The two options, subject to detailed design, being considered are:

- Option 1 - Raise the allotments spill crest to a minimum level of 59.25 mOD over a length of 75m (maximum height of wall 1210mm); and
- Option 2 - Modify allotments spill crest to provide a 16 m long spillway at 58.30 mOD with the remainder (59 m) raised to a minimum 59.17 mOD (maximum height of wall 1130 mm).

1.2.3 In order to achieve this, a wall is to be built on the northern side of the footpath alongside Whiteknights Road; this will also involve strengthening works to the allotment earth embankment adjacent to the footpath together with potential modifications to the Care Home spillway. This is likely to involve the loss of one or more existing trees within the site.

1.3 Aims of Study

1.3.1 PBA was commissioned to undertake an ecological appraisal of the site, in order to determine whether there were any ecological constraints associated with the proposed works and, where relevant, to provide recommendations to ensure compliance with wildlife legislation. The study comprised the following elements:

i. A desk study, including a review of the previous ecological survey work undertaken on the adjacent Residential Care Home in 2006, as well as data provided in May 2015 by the Thames Valley Environmental Records Centre and relevant resources available online; and

ii. An extended Phase 1 habitat survey (JNCC, 2010) of the site.

iii. A camera-trap survey of mammal earthworks within the site.

iv. An evening emergence and dawn re-entry survey of trees identified as having potential to support roosting bats.

1.3.2 The main aims of this report are to:

i. Confirm the outcome of the review of biological records obtained during the desk study;

ii. Describe the habitats present within the site;

iii. Assess the potential for the site to support protected or notable species and present the results of follow-up survey work carried out;

iv. Set out the legislative protection afforded to any habitats present or any species potentially associated with the site;

v. Present an assessment of ecological impacts of the proposed works based on the survey findings and understanding of the proposals;

vi. Provide recommendations for mitigation, compensation and enhancement measures to ensure that works will remain acceptable in legislative and planning terms.

2 Methods

2.1 Desk Study

2.1.1 Data on statutory and non-statutory designated areas and protected species and species of conservation importance[1] covering the site and land up to 1 km from the site boundary was sought from the Thames Valley Environmental Records Centre (TVERC) in May 2015. In addition, on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC, www.magic.gov.uk) website and online aerial photography of the area were also reviewed.

2.1.2 The Extended Phase 1 Habitat survey report conducted on the adjacent Lakeside Residential Care Home site in 2006 by Ecoconsult was also reviewed in order to assess the likelihood that protected and notable species present on that site are also to be present within the habitats present on site (Ecoconsult, 2006).

2.2 Extended Phase 1 Habitat Survey

2.2.1 The extended phase 1 habitat survey was undertaken by Stephen Foot MCIEEM on 26th May 2015. The weather conditions were dry with overcast skies (cloud cover was 8/8 *octas* throughout) and calm conditions (Beaufort Scale F1-F2). Air temperature ranged between 14˚C and 15˚C.

2.2.2 The habitats within the site were identified and described following standard JNCC Phase 1 habitat survey methodology as detailed in the Phase 1 Habitat Survey Handbook (JNCC, 2010). This uses a system of codes to describe different habitat types based on the dominant vegetation present. The survey was extended to give particular consideration to the potential of the habitats present to support protected species or species of conservation importance.

2.3 Camera-Trap Survey

2.3.1 A camera-trap survey was undertaken of an animal burrow identified as a result of the extended phase 1 survey described above. The camera trap was set up on the 24th June and left to run until it was picked up on the 2nd July. The camera was set to automatically trigger in response to motion through its detection field. This covered the animal earthwork and the immediate area surrounding this.

2.4 Bat Activity Survey

2.4.1 The tree identified as being Category 1 tree (i.e. providing features suitable to support roosting bats) was subject to further survey work, in accordance with the Bat Conservation Trust's Good Practice Guidance (Hundt, 2012). Survey visits were conducted on both the dusk of the 20th August 2015 and the dawn of the 27th August 2015. The dusk emergence survey began 15 minutes before sunset and continued until 1.75 hours after sunset. The dawn return to roost survey began 1.75 hours before sunrise and finished at sunrise.

2.4.2 Two surveyors attended each of the surveys to allow the potential roosting features present on the tree to be fully observed. The personnel, timings and weather conditions recorded during these visits are shown in Table 1.

[1] For the purposes of this report, species of conservation importance were defined as species listed in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act (see Appendix C).

Table 1: Personnel, timings and weather conditions during dusk emergence and dawn return to roost surveys

Date	Time of Survey	Time of Sunset/ Sunrise	Personnel	Weather Conditions
20/08/15	20:02-22:02	20:17	SF EA	Dry with overcast skies throughout the duration of the survey (8/8 cloud cover). A moderate breeze was also present throughout (Beaufort Scale F2) with air temperatures being warm ranging between 18 and 19°C.
27/08/15	04:23-06:08	06:08	SF SM	Dry throughout the survey with partial cloud at the start of the survey (4/8 cloud cover) becoming overcast at the end of the survey (8/8 cloud cover). Conditions were calm (Beaufort Scale F1-F2) and the air temperature was 14°C throughout the survey.

Personnel: SF: Stephen Foot MCIEEM, holder of Level 2 Class Licence for bats; EA: Ed Austin MCIEEM, experienced in undertaking bat emergence and re-entry survey work. SM: Sarah Muddell MCIEEM, holder of Level 2 Class Licence for bats.

2.4.3 The surveyors used EM3+ bat detectors to listen to and record echolocation calls of bats observed. Surveyors also noted the flight-lines of any bats observed. Any recorded calls were analysed using Analook computer software following the survey to confirm the identification of the species observed in the field.

2.5 Limitations to Methods

2.5.1 The extended Phase 1 habitat survey was undertaken at an optimal time of year for a survey of this type with plants and habitats being readily identifiable. As such there are considered to be no constraints with regard to this aspect of the site survey.

2.5.2 The mature/semi-mature scattered trees present on site were in full leaf at the time of survey. However, it was still possible to make a comprehensive assessment of the trees' potential to support roosting bats, given the proportion of the tree trunk and branches that were visible and other surrounding factors e.g. the presence of nearby street lighting. As such it is considered that it was possible to robustly assess the potential of the trees on site to support roosting bats, allowing appropriate follow-up activity survey work to be devised and executed during the relevant season for such work. The presence of nearby street-lighting also meant that use of night-vision equipment was not necessary for the evening emergence or return to roost survey.

3 Results and Interpretation

3.1 Overview

3.1.1 This section sets out the results of the desk study and field surveys and determines which of these have significance with reference to ecological legislation and planning policy for the proposed works.

3.2 Designated Areas

3.2.1 One statutory designated Local Nature Reserve (High Wood, Bulmershe, LNR) was identified approximately 900 m to the north-east of the site and comprises semi-natural woodland dominated by oak and birch. Two non-statutory designated Local Wildlife Sites (LWSs) are located within a 1 km radius of the site. The closest of these is Whiteknights Park LWS which encroaches into the south-eastern boundary of the site. This LWS is dominated by Whiteknights Lake with grassland and mix canopy woodland habitats. Full descriptions of the second LWS are provided in Table A1 in Appendix A.

3.3 Habitat Description

3.3.1 The following Phase 1 habitat types were recorded within the site during the survey:

- Scattered trees
- Dense continuous scrub
- Standing water
- Tall ruderal vegetation
- Marginal vegetation
- Amenity grassland
- Other habitat (Allotment)
- Dense continuous scrub and poor semi-improved grassland habitat mosaic
- Dense scrub and tall ruderal vegetation habitat mosaic
- Introduced shrub
- Species-poor hedgerow
- Dry ditch
- Bare ground
- Buildings and Hardstanding

3.3.2 The distribution of these habitats is shown on Figure 1 with summary descriptions given below. A selection of photographs are provided in Appendix B; target notes (TNs) referred to in the text below and on Figure 1 are also provided in Appendix B.

3.3.3 *Scattered trees:* A number of semi-mature and mature trees are scattered along the periphery of the allotment area and adjacent to the hedgerow in the south of the site. Species present

include pedunculate oak *Quercus robur,* hornbeam *Carpinus betulus* sycamore *Acer pseudoplatanus* and alder *Alnus glutinosa*. A number of these trees are covered with dense ivy *Hedera helix* growth (see TN10, 12, 13 and 14 in Appendix B and Figure 1). Mature lime *Tilia* sp. are also present in the grounds of the adjacent residential Care Home (within the site boundary).

3.3.4 *Dense continuous scrub:* A small parcel of dense continuous scrub is present in the north-eastern corner of the site with a further larger area present within the playing field in the north-western corner of the site (see TN6 and TN16 in Appendix B and Figure 1). Both parcels are dominated by bramble *Rubus fruticosus* agg. with occasional common nettle *Urtica dioica* and cleavers *Galium aparine*. Cow parsley *Anthriscus sylvestris* and green alkanet *Pentaglottis sempervirens* are locally frequent in the parcel located in the north-west of the site.

3.3.5 *Standing water:* Whiteknights Lake encroaches into the south-east of the site (see TN3 in Appendix B and Figure 1). This large eutrophic lake does not support any submerged aquatic macrophytes (likely due to foraging pressure from large numbers of carp and waterfowl noted during the field survey), however, the periphery is fringed with emergent marginal vegetation (see below).

3.3.6 Two very small plastic lined, ornamental waterbodies measuring approximately 50 cm by 50 cm by 30 cm in depth are present within the allotment area of the site. The first of these (see TN8 in Appendix B and Figure 1) supports watermint *Mentha aquatica* with the other water-body (see TN9 in Appendix B and Figure 1) lacking macrophytes with the exception of a dense covering of common duckweed *Lemna minor*.

3.3.7 *Tall ruderal vegetation:* A small stand of tall ruderal vegetation is present within the allotment area. This habitat parcel is dominated by common nettle with occasional cleavers.

3.3.8 *Marginal vegetation:* The northern margins of Whiteknights Lake support marginal vegetation approximately 1-1.5 m in width (see TN2 in Appendix B and Figure 1). This marginal vegetation is dominated by macrophyte species including abundant yellow flag iris *Iris pseudacorus*, frequent hemlock water-dropwort *Oenanthe croccata* and occasional common reed *Phragmites australis,* bulrush *Typha latifolia* and brooklime *Veronica beccabunga.*

3.3.9 *Amenity grassland:* The west of the site is dominated by closely mown, intensively managed amenity grassland. These habitat parcels support frequent perennial rye-grass *Lolium perenne*, cocksfoot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* with occasional red fescue *Festuca rubra.* Herbs and forbs present amongst the sward include frequent daisy *Bellis perennis* and white clover *Trifolium repens* with occasional ribwort plantain *Plantago lanceolata* and black medick *Medicago lupulina*. Amenity grassland pathways supporting a similar assemblage of plant species have been mown between plots in the allotment area.

3.3.10 *Other habitat (Allotment)*: The majority of the site consists of intensively managed allotments (see TN4 in Appendix B and Figure 1), separated by amenity grassland pathways, as described above. These allotments support a range of vegetable and fruit plants including apple *Malus domestica,* marrow *Cucurbita* sp, potato *Solanum* sp. and rhubarb *Rheum* sp.

3.3.11 *Dense continuous scrub and poor semi-improved grassland mosaic:* The south-western corner of the allotment area has become overgrown due to lack of recent management. Bramble dominates this parcel in places with grass, herb and forb species including frequent common nettle, cleavers, broadleaved dock *Rumex obtusifolius* and occasional false oat-grass *Arrhenatherum elatius,* Yorkshire fog, soft brome *Bromus hordaceus* and creeping buttercup *Ranunculus repens*.

3.3.12 *Dense scrub and tall ruderal vegetation:* This habitat parcel is located in the south-western corner of the allotment on a sloping embankment. Bramble dominates this parcel with frequent common nettle, ivy cleavers and occasional herb Robert *Geranium robertianum*.

3.3.13 *Introduced shrub*: A small number of introduced shrub beds are located within the gardens of the Lakeside Residential Care Home in the west of the site. These parcels contain non-native ornamental species including cherry laurel *Prunus laurocerasus* with euonymus *Euonymus* sp., rosemary *Rosmarinus officinalis*, Chinese juniper *Juniperus chinensis* and box *Buxus sempervirens*.

3.3.14 *Species-poor hedgerow:* Three species-poor hedgerows are present on site. The first of these runs between the footpath and the southern edge of Whiteknights Road in the south of the site (see TN1 in Appendix B and Figure 1). This hedgerow is well managed and is dominated by non-native species including abundant cherry laurel and bay laurel *Laurus nobilis*. A small number of native "woody species" are also present in the hedgerow including occasional hazel *Corylus avellana*, hornbeam, sycamore and English elm *Ulmus procera*. The ground flora associated with this hedgerow consists of abundant cleavers *Galium aparine* with frequent common nettle, barren brome *Bromus sterilis* and great burdock *Arctium lappa*.

3.3.15 A second well-maintained species-poor hedgerow borders the southern boundary of the allotment area (to the north of Whiteknights Road) (see TN5 in Appendix B and Figure 1). The eastern extent of this hedgerow is dominated by garden privet *Ligustrum ovalifolium* with occasional sycamore. The western extent of the hedgerow supports locally abundant English elm with occasional hawthorn *Crataegus monogyna* in addition to the garden privet. Common nettle, bramble, garlic mustard *Alliaria petiolata* and cleavers are present in the ground flora associated with this hedgerow.

3.3.16 The third hedgerow borders the northern boundary of the east/centre of the site (see TN7 in Appendix B and Figure 1). This hedgerow is predominantly native in composition and comprises frequent hawthorn and garden privet with occasional sycamore and hazel. Bramble and cleavers are associated with the hedgerow understorey.

3.3.17 *Dry ditch:* A ditch, dry at the time of the survey in May 2015, lies in the south-western corner of the allotment (see TN11 in Appendix B and Figure 1). This ditch appears to have been dry for a significant time and supports occasional rosebay willowherb *Chamerion angustifolium* and locally frequent hemlock water-dropwort.

3.3.18 *Bare ground:* A gravel/stone footpath runs from east to west between the lake and Whiteknights Road.

3.3.19 *Buildings and hardstanding:* A small wooden shelter lies within the grounds of the Lakeside Residential Care Home in the west of the site. The remainder of the site includes hardstanding comprising Whiteknights Road and pedestrian access (pavements).

Habitat Summary

3.3.20 The majority of habitats on site are intensively managed and readily established (amenity grassland, introduced shrub beds, allotment) supporting common and widespread (often non-native) plant species and as such have limited intrinsic ecological value. However, the predominantly native hedgerow on the northern boundary of the site and the eutrophic lake (Whiteknights Lake) are classified as Habitats of Principal Importance (HPIs)[2]. A number of the trees within and around the site support Tree Preservation Orders; any works affecting these trees will need permission from Reading Borough Council to proceed.

3.4 Protected and Notable Species

3.4.1 Records of 23 protected and/or notable species from within a 1 km search area were supplied by TVERC. None of these records were from within the site itself. The results of the desk study are summarised in Table A2 in Appendix A. Please note that records dated pre-2005

[2] Habitats of Principal Importance (HPI's)[2] in England drawn up on a list in response to the requirements of Section 41 of the Natural Environment and Rural Communities Act, 2006.

were excluded as over 10 years has now passed making this data less relevant. In addition to this, where a species has been recorded multiple times, only the most recent and closest record to the site has been included.

3.4.2 This section describes these existing records in the light of any evidence of, or potential for, protected and/or notable species identified during the field survey. The relevant legislation for each species or species group is also briefly summarised below with detailed legislation presented in Appendix C.

Invertebrates

3.4.3 Records of stag beetles *Lucanus cervus* were provided in the results of the desk study. The closest record was 170 m to the north-east of the site. This species is classified as a Species of Principal Importance (SPI) [3] (see Appendix C).

3.4.4 The stag beetle lays its eggs in soft soil near to rotting wood. The larvae then hatch and feed on this dead and decaying wood (PTES, undated). The trees on site are generally in good condition with limited/no rotting wood habitat present on site. Though adult beetles may fly through the site on occasion, the mature parcels of woodland to the south surrounding the lake are likely to offer superior foraging and sheltering habitat for this species. Given the lack of suitable habitat for breeding stag beetles/stag beetle larvae to be present it is considered unlikely that this species uses the site on a regular basis and as such will not be considered further in this assessment.

Amphibians

3.4.5 No records of great crested newts *Triturus cristatus* were provided in the results of the desk study. However, records of common toads *Bufo bufo* were supplied, the closest being approximately 540 m to the south of the site in 2014. Both great crested newts and common toads spend a proportion of the year in aquatic habitats where they breed. The remainder of the year is spent foraging and sheltering in terrestrial habitats including woodland, scrub and rough grassland (Inns, 2009). The debris (carpet and wooden boarding), dense scrub, unmanaged grassland and hedgerows on site are considered to provide suitable terrestrial habitat for these and other species of amphibian.

3.4.6 Great crested newt larvae do not coexist well where populations of fish are present (i.e. in Whiteknights Lake to the south) given that they tend to swim and forage within the water column and are readily predated upon as a result of this behaviour (Beebee, 2013). The two waterbodies on site within the allotments are also considered to be too small to support great crested newts. Given a lack of records for this species within 1 km radius of the site, the isolation of the site by roads and built development and the unsuitability of any nearby water-bodies to support this species (due to the presence of fish or small size) it is considered that their presence on site is extremely unlikely. As a result this species will not be considered further in this assessment.

3.4.7 Despite declines in the population, common toads are widely distributed throughout a large range and are probably present in every 10-km square of lowland, mainland Britain (Edgar *et al*, 2011). This species has a preference for medium or large water-bodies and tolerates the presence of fish well (Beebee, 2013 and Baker *et al*, 2011). Therefore their presence in Whiteknights Park (including Whiteknights Lake) to the south is unsurprising despite large numbers of common carp being present. The two very small water-bodies in the allotment area of the site are considered suboptimal for this species. However, it is possible that small numbers of common toads utilise the habitats on site as a foraging and sheltering resource given the site's proximity to Whiteknights Lake (which is likely to provide suitable breeding habitat for toads). The common toad is a Species of Principal Importance (SPI) in England.

[3] Species of Principal Importance (SPI's)[3] in England drawn up on a list in response to the requirements of Section 41 of the Natural Environment and Rural Communities Act, 2006

Selection of this species was not due to scarcity, rather to recent declines in population size (Baker *et al*, 2011). As such steps should be put forward to minimise impacts to this species during subsequent works.

Reptiles

3.4.8 Records of both common lizards *Zootoca vivipara* and slow worms *Anguis fragilis* were provided in the results of the desk study. Records of both species were associated with Bulmershe Allotments and Mays Close located 730 m to the north-east of the site. Targeted surveys for this species group were undertaken in 2006 by Ecoconsult on the adjacent Lakeside Residential Care Home site. A total of 12 artificial refugia were deployed and periodically checked in conjunction with visual inspection surveys for reptiles. No reptiles were recorded during this targeted survey effort (Ecoconsult, 2006).

3.4.9 Reptiles prefer a mosaic of habitats with a varied vegetation structure providing conditions suitable for both sheltering and foraging (Edgar *et al*, 2010). Suitable habitat including pockets of dense scrub and the mosaic of dense scrub and unmanaged poor semi-improved grassland in the south-west of the allotment area, is present on site. Debris (carpet and wooden boarding) is also present in the allotment area which could provide sheltering opportunities for reptiles (slow worms in particular). However, in contrast to the Bulmershe allotments, which are connected to an extensive area of woodland and scrub, the allotment area in the centre of the site is isolated from nearby suitable habitat by built development to the north and east, Whiteknights Road to the south and closely mown amenity grassland and further built development/roads to the north-west and west. Given this it is considered that the presence of reptiles on site is extremely unlikely; if present, they are only likely to be present in very small numbers.

3.4.10 However, common lizard and slow worm are protected under the Wildlife and Countryside Act, 1981 (as amended) and are classified as SPI's (see Appendix C). Therefore, precautionary recommendations are put forward in Section 4 to ensure that, in the unlikely event common lizard and slow worm were present, they would be protected from killing and injury to avoid contravention of legislation.

Breeding Birds

3.4.11 Records of two species of Schedule 1 birds were provided in the results of the desk study. These were the kingfisher *Alcedo atthis* and the red kite *Milvus* milvus (also recorded flying over the site). Kingfishers nest within burrows made in steeply sloping sand/earth banks (Holden and Cleeves, 2002). There are no suitable banks on the lake capable of supporting nesting kingfisher. For this reason kingfishers are not considered further in this assessment.

3.4.12 Red kites *Milvus milvus* have increased their range since their reintroduction to the Chilterns between 1989 and 1994 (Carter and Whitlow, 2005). It is evident that this species forages over the site on occasion. The oak and lime trees on site have some potential to provide nesting habitat for this species (no evidence of previous or current nesting was identified); however, given the abundance of more suitable, less disturbed woodland parcels and mature trees in the surrounding landscape (woodland to the south) it is considered that nesting on site by this species is unlikely. For these reasons it is considered that the site is unlikely to support breeding red kites and therefore this species will not be considered further in this assessment.

3.4.13 A total of 16 species of bird were incidentally recorded on or near the site during the extended Phase 1 habitat survey (see Table 1 for a list of these species).

Table 2: Birds recorded on site during extended Phase 1 Habitat Survey

Common Name	Scientific Name
Blackbird	*Turdus merula*
Canada goose	*Branta canadensis*
Common crow	*Corvus corone*
Coot	*Fulica atra*
Dunnock	*Prunella modularis*
Great spotted woodpecker	*Dendrocopus major*
Great tit	*Parus major*
Greenfinch	*Carduelis chloris*
Mallard	*Anas platyrhynchos*
Moorhen	*Gallinula chloropus*
Red kite	*Milvus milvus*
Robin	*Erithacus rubecula*
Song thrush	*Turdus philomelos*
Swift	*Apus apus*
Wood pigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*

3.4.14 The scattered trees, dense scrub, tall ruderal vegetation hedgerows, marginal vegetation and introduced shrubs have the potential to provide some nesting habitat for some of these and other common species of breeding birds. A moorhen was observed on a nest within the marginal vegetation on the edge of Whiteknights Lake with dunnocks also recorded nesting in parcels of dense scrub in the allotment area.

3.4.15 All wild birds, their nests and eggs receive protection under the Wildlife and Countryside Act 1981 (as amended) in respect of intentional killing and injury or damage and destruction (see Appendix C). Therefore subsequent sections of this report provide recommendations to avoid contravention of this legislation.

Bats

3.4.16 Records of 6 species of bat were provided in the results of the desk study. The closest of these was a record of a brown long-eared bat *Plecotus auritus* approximately 330 m to the north of the site with records of common pipistrelle *Pipistrellus pipistrellus,* soprano pipistrelle *Pipistrellus pygmaeus*, noctule bat *Nyctalus noctula,* serotine bat *Eptesicus serotinus* and Daubenton's bat *Myotis daubentonii* located in Whiteknights Park approximately 530 m to the south of the site.

3.4.17 Dusk emergence/dawn return to roost surveys were carried out on the site of the Lakeside Residential Care Home adjacent to the site to the west by Ecoconsult in 2006. Four species of bat were recorded using the site including common and soprano pipistrelle, a *Myotis* bat (likely whiskered/Brandts) and noctule bat. A possible whiskered bat *Myotis mystacinus* was also recorded emerging from a pine tree in the north-east of the site (this tree is still present outside of the site boundary) (Ecoconsult, 2006).

3.4.18 Four of the trees on the periphery of the allotment area are considered to have features capable of supporting roosting bats (see TN10, 12, 13 and 14). Of these trees TN10, 12 and 14 have dense ivy cover that is only capable of supporting small numbers or individual bats on a sporadic/occasional basis (Category 2 trees in accordance with BCT guidance on roost potential). The mature pedunculate oak (TN13) has rot holes and splits in the trunk/branches and has been assessed as a Category 1 trees, in accordance with BCT guidance on roost potential (Hundt, 2012). However, a streetlight lies immediately adjacent to the tree which is likely to limit the potential of this tree to support bat species.

3.4.19 The allotment area and scrub in the north-east is considered to have low value as a commuting/foraging resource to bats with Whiteknights Lake in the south and woodland off site considered to provide higher quality habitat.

3.4.20 Both bats and their roosts are afforded protection under the Conservation of Species and Habitats Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended). In broad terms these pieces of legislation jointly mean that the animals themselves are protected against killing, injury, taking (capture) and disturbance. In addition their places of shelter are protected against damage, destruction and obstruction (see Appendix C). Given this, protection, bat activity survey work was carried out to determine whether there was any evidence of use of the Category 1 tree.

3.4.21 No bats were recorded emerging from, or returning to roost within, the oak tree (TN13). During the dusk emergence survey noctule bats (*Nyctalus noctula*) were recorded commuting high over the site to forage over Whiteknights Lake to the south of Whiteknights Road. The earliest of these was recorded at 20:06 (11 minutes before sunset). The timings of these calls suggest that the noctule roost is likely to be close by, possibly in woodland surrounding the lake. During this survey a soprano pipistrelle (*Pipistrellus pygmaeus*) was recorded at 20:24 (7 minutes after sunset). Pipistrelle bats tend to emerge from a roost between 0 and 33 minutes after sunset (Russ, 2013) indicating that this bat was likely to be roosting very close to the site. Subsequent pipistrelle bats recorded were seen to be flying along the allotment hedgerow from the east/south-east. A small number of common pipistrelle bats (*Pipistrellus pipistrellus*) were also recorded during this survey, with the earliest being at 20:38 (21 minutes after sunset). This bat was also likely to be roosting close to the site. The greater numbers of soprano pipistrelle bats encountered is to be expected given the location of the site (adjacent to Whiteknights Lake) as this species is more specialist in their habitat preferences, being substantially more strongly dependent on riparian forests, lowlands and waters of any size, in particular still waters (Dietz *et al*., 2009; Russ, 2013).

3.4.22 During the dawn survey a similar assemblage of bats was recorded, with both common and soprano pipistrelle bats foraging beneath the oak tree (TN13) during the first 30-50 minutes of the survey. The last recorded common pipistrelle bat was at 05:32 (36 minutes before sunrise). This bat was observed flying in a southerly direction towards trees/woodland associated with Wessex Hall. The last recorded soprano pipistrelle bat at 05:42 (26 minutes before sunrise) was also observed commuting in the same direction as the common pipistrelle bat with the last observed noctule bat commuting from the lake in an easterly direction also at 05:42 (26 minutes before sunrise). The observed flight lines of these bats and timings of calls suggest that a roost is close by (to the south-east), though not on site.

3.4.23 As no bats were recorded emerging from or re-entering suitable features (rot holes/splits in the trunk) present on the oak tree (TN13), there are no known legislative constraints with regard to bats and the felling of this tree, should this be required. However, given that suitable features for roosting bats are present and ecological resources are not static, precautionary measures are provided in the following section of the report for both the Category 1 and 2 trees, to ensure that contravention of the legislation relating to bats is avoided.

Foxes

3.4.24 A mammal burrow was identified in the embankment in the south-western corner of the allotment area (see TN15 in Appendix B and Figure 1). The burrow (its size and shape) is characteristic of a fox *Vulpes vulpes*. Local allotment-holders report that a fox is regularly seen in the area.

3.4.25 Mammals receive limited protection under the Wild Mammals (Protection) Act, 1996 (as amended), see Appendix C, and therefore a camera trap survey to check for current use of the burrow was undertaken, given that it is likely the burrow would be directly affected by the proposed works.

3.4.26 The camera recorded no foxes or other large mammals associated with the burrow. Dunnock, great tit, grey squirrel and brown rat were recorded on the camera moving past the burrow's entrance. In light of these findings, the burrow was not in use during the survey and recommendations were provided with regards to appropriate approach to prevent future use (see section 4).

4 Impacts and Recommendations

4.1 Overview

4.1.1 The likely impacts of the proposed works on the ecological resources identified as being present, or likely to be present, within the site and its surrounding area are discussed below, along with the appropriate mitigation and compensation that will be required to ensure that works are in compliance with legislation.

4.2 Designated Sites

4.2.1 Given the small scale of the works and the distance between the High Wood Bulmershe LNR and the site it is predicted that direct or indirect impacts as a result of the proposed works will not occur.

4.2.2 The non-statutory designated site (Whiteknights Park LWS) encroaches into the south-east of the site. Despite not being specifically protected by legislation, it is recommended that adverse impacts to this LWS are avoided. In the absence of appropriate mitigation measures, direct impacts could arise during works through dust, noise and possible contamination of the water. In practice it is recommended that method statements for the proposed works are written with reference to established good practice guidance related to working practice. The Environment Agency no longer provides good practice guidance although a range of documents are available via the national archives (e.g. the Pollution Prevention Guidance https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg).

4.3 Habitats

4.3.1 The majority of habitats on site are common and widespread and as such are easily replaceable. The small scale of works may result in the temporary loss of small areas of allotment and amenity grassland which is considered to have a limited impact on the biodiversity value of the site.

4.3.2 Where possible all trees and hedgerows should be retained and protected throughout the proposed works. As a minimum works should adhere to British Standard: 5837:2012 "*Trees in Relation to Design, Demolition and Construction*" which prescribes the need for the following protection measures:

- Erection of stout fencing around each tree or hedgerow in advance of clearance works, enclosing the Root Protection Area;
- Prohibition of construction activities, material storage, use of vehicles, fires, etc within the fenced area to prevent damage to tree roots and compaction of the soil; and
- Maintenance of an adequate water supply to the trees and hedgerows both during and after construction.

4.3.3 This is particularly important with regard to the species-poor hedgerow (TN7), along the northern boundary of the site, classified as a Habitat of Principal Importance (see section 3.3.20) due to the predominance of native woody species within this hedgerow. The other hedgerows generally comprise non-native, ornamental species and as such are of lesser biodiversity value in this context.

4.3.4 Where it is not possible to retain trees during the works, permission is likely to be required from Reading Borough Council for tree-felling works to proceed given a number of trees within the site are protected through Tree Preservation Orders.

4.3.5 The recommendations in Section 4.2 above should be adhered to in order to ensure that adverse impacts to Whiteknights Lake (also an HPI) are avoided during the proposed works.

4.4 Protected Species and Species of Conservation Importance

Reptiles and Amphibians

4.4.1 Given the results of previous survey work and the isolation of the site, the presence of reptiles is considered to be extremely unlikely. However, small numbers of reptiles cannot be entirely ruled out. Therefore, a precautionary working method during site clearance is recommended in order to ensure that the legislation protecting individual reptiles is not contravened. In essence, this would involve the phased removal of vegetation in order to allow any individual reptiles (and other small fauna), if present, the opportunity to move out of the area. This would be achieved as follows:

i. Necessary vegetation clearance works should ideally be undertaken between March and October inclusive when reptiles are most active.

ii. The vegetation to be cleared should first be strimmed or mown to a short height working from the centre of the site out toward the edges to encourage reptiles to naturally disperse to retained areas of vegetation on site.

iii. The removal of features considered to provide potential for sheltering reptiles (e.g. the wooden boarding and carpet) should be conducted under the supervision of an ecologist at an appropriate time of year (see first bullet).

iv. Any reptiles found will be moved to suitable habitat close to, but outside the site or working area boundary (e.g. into the bases of retained hedgerows or onto other dense vegetation nearby).

v. Any vegetation arising from site clearance should ideally be disposed of off-site to avoid creating new cover that could be used by reptiles.

4.4.2 Adhering to the guidance outlined above will ensure that reptiles (if present) are protected from reckless killing and injury during any subsequent site works. This will also ensure that common toads will not be harmed during works as effort should be made to watch for this species during vegetation/debris clearance/removal.

Breeding Birds

4.4.3 The scattered trees, marginal vegetation, tall ruderal vegetation, hedgerows and introduced shrub beds provide nesting habitat for common, widespread species of breeding birds. In order to avoid damage or destruction of nests and eggs, or killing or injury of young birds in nests, vegetation clearance/tree felling should be timed to avoid the breeding season of common bird species. In practice, this means that clearance of such areas should be undertaken within the period from September to February inclusive, as a guide. If this timing is not possible, all areas to be cleared should first be checked by an ecologist or other suitably qualified individual for active nests. This would involve watching the areas for signs of bird activity and undertaking a search to look for active nest sites; in the event that nesting activity was identified the clearance works in the vicinity of the nest would need to cease until the bird had finished nesting.

Bats

4.4.4 Four trees within the site boundary were assessed as having low potential to support a bat roost. Of these four trees, three have ivy cover with very limited potential to support individual bats on a very occasional basis (TN10, 12 and 14) (Category 1 trees). If trees TN10, TN12 and TN14 require felling to facilitate the proposed works, they should be “soft-felled” by

suitably qualified arborists; i.e. felled in sections which are carefully lowered to the ground to be searched by a bat licenced ecologist. In the unlikely event a bat is found during soft felling, all works must cease and advice must be sought in order determine the best way to proceed.

4.4.5 The mature oak (TN13) supports more suitable roosting features than the other three trees (splits in the branches and rot holes) (Category 2 tree). A dusk emergence and dawn return to roost survey was conducted in order to determine the presence/likely absence of roosting bats from the mature oak tree (TN13). No bats were recorded emerging from or returning to roost within this tree.

4.4.6 In the event that this tree will be affected (felled/pruned), given no evidence of roosting bats was identified during the surveys, there are no legislative constraints with regard to roosting bats which would prevent this proceeding. Given that the presence of suitable bat-roosting features remain, and ecological resources are not static, it is recommended that the tree be soft-felled in the presence of a licenced bat ecologist, as described above for the Category 1 trees.

4.4.7 Roosting provision in the form of bat boxes could be provided on retained trees within the site as an enhancement measure, if the Council are looking for the proposed works to secure measures suitable for biodiversity gain.

Foxes

4.4.8 The mammal burrow was filled in once confirmation of lack of use had been obtained from the camera trap survey. Providing the backfill remains secure, no further mitigation measures are required prior to implementation of the works.

4.4.9 Given the known presence of this species in the area, there is a chance that they could become trapped in excavations during the proposed works. In order to ensure that foraging foxes (and other fauna) are not harmed during the construction process, any trenches within the working area of the site will either be covered over-night, or planks of wood will be secured within the trench to allow foxes to escape via a ramp should they fall in.

5 Conclusion

5.1.1 This extended Phase 1 habitat survey was conducted to specifically determine any ecological constraints to proposed modifications to the embankment crest and downstream slope of Whiteknights Lake. In particular to determine the potential for the proposals to impact legally protected species and/or habitats, or habitats and species of conservation importance.

5.1.2 The desk study determined that Whiteknights Lake itself also forms part of a locally designated Local Wildlife Site. The extended phase 1 habitat survey results identified habitat suitable to support nesting birds, potential bat-roosting habitat (in mature trees), sheltering and foraging habitat for small numbers/individual herpertofauna (reptiles and common toads) and a mammal burrow (likely to be fox in origin). Follow-up survey work determined that the tree was not being used by bats and that the mammal burrow was not in current use.

5.1.3 Recommendations have been included within this report to ensure that the proposed works minimise any possible adverse impacts to the Whiteknights Park LWS. In addition, working methods have been proposed which will ensure protection of retained vegetation, and will ensure contravention of the legislation relating to protected species will be avoided. Providing these measures are adhered to there are no overriding legislative reasons relating to these sites/protected species that would prevent the proposed works.

5.1.4 In the event that Reading Borough Council is seeking enhancements as part of the scheme design, consideration could be given to the provision of bat boxes on retained trees.

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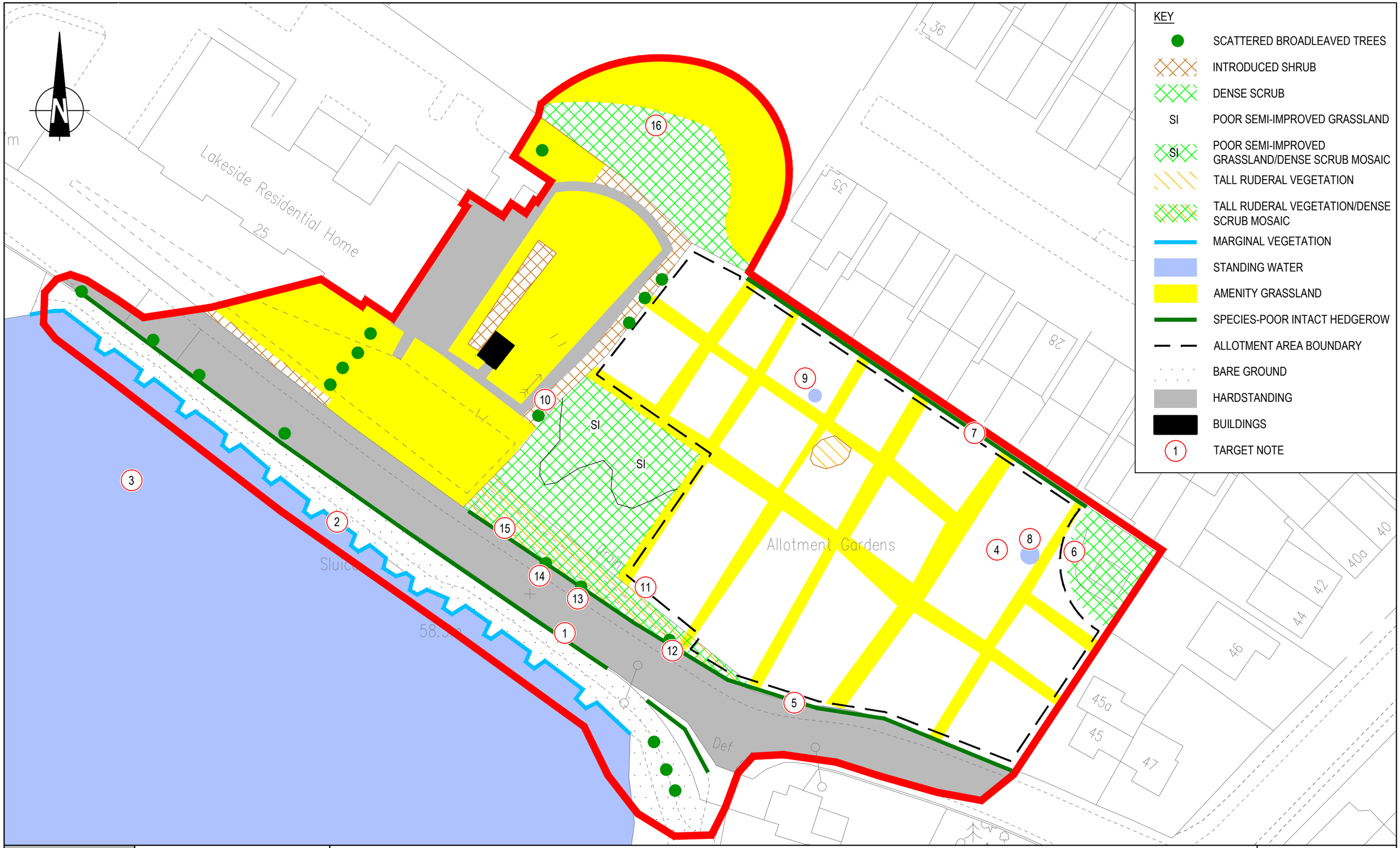
Figures

Figure 1. Extended Phase 1 Habitat Survey Map



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RBC LLFA SUPPORT

WHITEKNIGHTS RESERVOIR

PHASE ONE HABITAT SURVEY

Date	NYI.2015
A3 Scale	1:500
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Checked by	HE
Figure Number	1

Appendix A Desk Study Results

A.1 Statutory and Non-statutory Designated Areas with 1 km of Site Boundary

Site Name	Area (ha)	Grid ref.	Description
Local Statutory Designated Sites			
High Wood Bulmershe LNR	14.75	SU 751 726	This reserve is located approximately 900 m to the north-east and comprises semi-natural woodland dominated by oak and birch.
Non-statutory Designated Sites			
Whiteknights Park LWS	26.09	SU 737 718	This Local Wildlife Site encroaches into the south eastern boundary of the site. This site is dominated by a eutrophic lake with grassland and mix canopy woodland habitats.
Reading Cemetery LWS	4.7	SU 733 732	This site lies 820 m to the north west of the site. This large cemetery is surrounded by a high stone wall with parcels of semi-improved grassland split into sections by concrete footpaths. This grassland supports some flower-rich areas.

A.2 Protected Species and Species of Conservation Importance within a 1 km radius of the site.

Common name	Scientific name	Date	Grid ref.	Location and distance from the site
Stag beetle	*Lucanus cervus*	2007	SU 741 722	Approximately 170 m to the north-east of the site.
Common toad	*Bufo bufo*	2014	SU 737 717	Approximately 540 m to the south of the site.
Common lizard	*Zootoca vivipara*	2006	SU 746 724	Approximately 730 m to the north-east of the site.
Slow worm	*Anguis fragilis*	2009	SU 749 723	Approximately 970 m to the north-east of the site.
Mallard	*Anas platyrhynchos*	2014	SU 737 717	Approximately 540 m to the south of the site.
Lapwing	*Vanellus vanellus*	2014	SU 737 717	Approximately 540 m to the south of the site.
Pochard	*Aythya ferina*	2014	SU 737 717	Approximately 540 m to the south of the site.
Herring gull	*Larus argentatus*	2014	SU 737 717	Approximately 540 m to the south of the site.
Lesser black-backed gull	*Chroicephalus ridibundus*	2014	SU 737 717	Approximately 540 m to the south of the site.
Kingfisher	*Alcedo atthis*	2014	SU 737 717	Approximately 540 m to the south of the site.
Cuckoo	*Cuculus canorus*	2014	SU 737 717	Approximately 540 m to the south of the site.
Red kite	*Milvus milvus*	2014	SU 737 717	Approximately 540 m to the south of the site.
Bullfinch	*Pyrrhula pyrrhula*	2014	SU 737 717	Approximately 540 m to the south of the site.

Common name	Scientific name	Date	Grid ref.	Location and distance from the site
Kestrel	*Falco tinnunculus*	2014	SU 737 717	Approximately 540 m to the south of the site.
House martin	*Delichon urbicum*	2014	SU 737 717	Approximately 540 m to the south of the site.
Lesser spotted woodpecker	*Dendrocopus minor*	2014	SU 737 717	Approximately 540 m to the south of the site.
Green woodpecker	*Picus viridis*	2014	SU 737 717	Approximately 540 m to the south of the site.
Serotine	*Eptesicus serotinus*	2006	SU 7472	Approximately 600 m to the east of the site.
Daubenton's bat	*Myotis daubentonii*	2012	SU 738 717	Approximately 530 m to the south of the site.
Noctule	*Nyctalus noctula*	2012	SU 738 717	Approximately 530 m to the south of the site.
Common pipstrelle	*Pipistrellus pipistrellus*	2012	SU 738 717	Approximately 530 m to the south of the site.
Soprano pipistrelle	*Pipistrellus pygmaeus*	2012	SU 738 717	Approximately 530 m to the south of the site.
Brown long-eared bat	*Plecotus auritus*	2012	SU 735 727	Approximately 330 m to the north of the site.

Appendix B Target Notes and Photographs

B.1 Target Note 1

B.1.1 A species-poor hedgerow lines the footpath and the southern edge of Whiteknights Road in the south of the site. This hedgerow is well managed and is dominated by non-native species including abundant cherry laurel *Prunus laurocerasus* and bay laurel *Laurus nobilis*. A small number of native "woody species" are also present in the hedgerow including occasional hazel *Corylus avellana*, hornbeam *Carpinus betulus*, sycamore *Acer pseudoplatanus* and English elm *Ulmus procera*. The ground flora associated with this hedgerow consists of abundant cleavers *Galium aparine* with frequent common nettle *Urtica dioica*, barren brome *Bromus sterilis* and great burdock *Arctium lappa* (see Photograph 1).

B.2 Target Note 2

B.2.1 The northern margins of Whiteknights Lake support marginal vegetation 1-1.5 m in width. This is dominated by macrophyte species including abundant yellow flag iris *Iris pseudacorus*, frequent hemlock water-dropwort *Oenanthe crocata* and occasional common reed *Phragmites australis*, greater reedmace (bulrush) *Typha latifolia* and brooklime *Veronica beccabunga*.

Photograph 1: The species-poor hedgerow and marginal vegetation associated with Whiteknights Lake in the south of the site.

B.3 Target Note 3

B.3.1 Whiteknights Lake is located on the southern boundary of the site. This large waterbody supports a number of common waterfowl species including mallard, coot, moorhen and Canada goose. Large numbers of common carp were present in the lake shallows.

B.4 Target Note 4

B.4.1 The majority of the site consists of intensively managed allotments. These allotments support a range of vegetable and fruit plants. The south-western corner of the allotment has become overgrown and dominated by a mosaic of dense continuous bramble scrub with poor semi-improved grassland.

Photograph 2: The allotment area in the centre of the site.

B.5 Target Note 5

B.5.1 A well-maintained species-poor hedgerow borders the southern boundary of the allotment area (to the north of Whiteknights Road). The eastern extent of this hedgerow is dominated by garden privet *Ligustrum ovalifolium* with occasional sycamore. The western extent of the hedgerow supports locally abundant English elm with occasional hawthorn *Crataegus monogyna* in addition to garden privet. Common nettle, bramble *Rubus fruticosus* agg., garlic mustard *Alliaria petiolata* and cleavers are present in the ground flora associated with this hedgerow.

B.6 Target Note 6

B.6.1 A stand of dense bramble scrub in the north-eastern corner of the site. A pair of dunnocks *Prunella modularis* were observed in this area indicating that a nest is present.

B.7 Target Note 7

B.7.1 A species-poor native hedgerow borders the northern boundary of the east/centre of the site. This hedgerow comprises frequent hawthorn and garden privet with occasional sycamore and rare hazel. Bramble and cleavers are associated with the hedgerow understorey.

B.8 Target Note 8

B.8.1 A small pond within the allotment area measuring approximately 60 cm by 60 cm and 30-40 cm in depth. This small pond is dominated by water mint *Mentha aquatica*.

B.9 Target Note 9

B.9.1 Another small waterbody within the allotment area. This small pond has similar dimensions to TN8 described above. A dense layer of duckweed *Lemna minor* covers the surface of the waterbody.

Photograph 3: One of the waterbodies present in the allotment area of the site

B.10 Target Note 10

B.10.1 A mature sycamore with dense ivy cover offering very limited roosting opportunities for individual bats.

B.11 Target Note 11

B.11.1 A drainage ditch in the south-west of the allotment area. This ditch is dominated by hemlock water dropwort with occasional rosebay willowherb *Chamerion angustifolium*. Dry during the survey in May 2015.

B.12 Target Note 12

B.12.1 A young sycamore with dense ivy cover offering very limited roosting opportunities for individual bats.

B.13 Target Note 13

B.13.1 A mature pedunculate oak *Quercus robur* with splits/rot holes in the trunk offering roosting opportunities for small numbers of bats. Street-lighting immediately adjacent to this tree is likely to have a limiting effect on this tree's suitability as a roosting site. Tree subject to Tree Preservation Order.

Photograph 4: Tree at TN13 with rot holes and splits offering some roosting possibilities to bats.

B.14 Target Note 14

B.14.1 A mature hornbeam with dense ivy cover offering very limited roosting opportunities for individual bats. Tree subject to Tree Preservation Order.

B.15 Target Note 15

B.15.1 A mammal burrow, thought to be of fox origin in the south-western corner of the allotment area.

Photograph 5: Fox earth in dense scrub/tall ruderal vegetation in the south-western corner of the allotment area.

B.16 Target Note 16

B.16.1 An area of dense continuous scrub encroaching onto the playing field in the north-western corner of the site. This habitat parcel is dominated with common nettle with occasional bramble, cleavers and cow parsley *Anthriscus sylvestris*.

Appendix C Summaries of Relevant Legislation

C.1.1 This section briefly summarises the relevant legislation pertaining to species mentioned within this report. Please note that the following text does not constitute legal advice.

C.2 European Legislation – Bats

C.2.1 The original (1994) "*Habitat Regulations*" transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law. The Conservation of Habitats and Species Regulations 2010 (as amended) consolidates the various amendments that have been made to the Regulations.

C.2.2 "*European protected species*" (EPS) are those which are present on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended); this includes all UK bats. These species are subject to the provisions of Regulation 41 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

- Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
- Possess or control any live or dead specimens or any part of, or anything derived from a these species
- deliberately disturb wild animals of any such species
- deliberately take or destroy the eggs of such an animal, or
- intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

C.2.3 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

- to impair their ability to survive, to breed or reproduce, or to rear or nurture their young,
- or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- to affect significantly the local distribution or abundance of the species to which they belong.

C.2.4 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogation) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works. In accordance with the requirements of the Regulations (2010), a licence can only be issued where the following requirements are satisfied:

- 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'*
- '*There is no satisfactory alternative'*
- The proposals '*will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range*".

C.3 National Legislation

The Natural Environment and Rural Communities Act, 2006

C.3.1 The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. 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. The list of Species and Habitats of Principal Importance (SPIs and HPIs) has been drawn up in consultation with Natural England, as required by the Act. This list (sometimes referred to as the England Biodiversity list or S41 List) is almost entirely based on the species and habitats identified as requiring action under the UK Biodiversity Action Plan, with some additions.

C.3.2 The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act, to have regard to priority species and habitats in exercising their functions.

Breeding birds

C.3.3 All wild birds in the UK are protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs.

Schedule 1 Bird Species

C.3.4 Bird species listed on Schedule 1 of the WCA (e.g. red kite) receive additional protection from disturbance at or near an occupied nest site. Schedule 1 of the Act makes it an offence to intentionally or recklessly disturb this species while it is building a nest or is in, on or near a nest containing eggs or young. It also makes it an offence to intentionally or recklessly disturb dependent young of this species.

Reptiles

C.3.5 The common, widespread species of reptile (slow worm, grass snake, adder and common lizard) are protected through Sections 9(1) and 9(5) of the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000, making it an offence to:

- Intentionally or recklessly kill or injure any reptile;
- Sell, offer for sale, possess or transport for the purchase of sale or publish advertisements to buy or sell any reptile.

Wild Mammals (Protection Act, 1996 (as amended)

C.3.6 Under the Wild Mammals (Protection) Act 1996 it is an offence to cause unnecessary suffering to wild mammals, including crushing and asphyxiating. This Act is primarily concerned with animal welfare and aims to prevent cruelty. As a result, offences include those actions with the intent to inflict unnecessary suffering. A wild mammal includes any mammal which is not domestic or captive. Red foxes and other mammals such as rabbits are therefore covered by the Act